

**UNIVERSITY OF SOUTHAMPTON**

**Evaluation of support interventions for mothers  
following their baby's discharge from a neonatal unit**

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ABSTRACT

FACULTY OF SOCIAL SCIENCES  
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Doctor of Philosophy

**EVALUATION OF SUPPORT INTERVENTIONS FOR MOTHERS FOLLOWING THEIR  
BABY'S DISCHARGE FROM A NEONATAL UNIT**

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The principal aim of this thesis was to determine the effect of specific support interventions on the anxiety and mood states of mothers who had their baby discharged home from a neonatal unit. A secondary aim was to identify the characteristics that appeared to influence the anxiety and mood states of mothers following their baby's discharge home. A third aim was to explore the extent of differences between mothers who had their baby discharged from a neonatal unit and mothers who were discharged home with their baby following standard postnatal care.

The support interventions were 'Baby Helpline' - 24 hour telephone support and information specifically established for this study and 'Baby Check' – a self-assessment scoring system devised to help parents assess the severity of acute illness in babies under six months of age. Anxiety and mood were assessed using the Spielberger State-Trait Anxiety Inventory and the Profile of Mood States Bi-Polar Form respectively.

The findings of a randomised controlled trial showed that access to 'Baby Helpline' and/or 'Baby Check' neither increased nor decreased the anxiety or mood states, or the magnitude of change in anxiety or mood states over time in mothers who had their baby discharged home from a neonatal unit. However, the numbers of mothers in the study were small and the findings that access to 'Baby Helpline' and or 'Baby Check' showed no evidence of effect on anxiety or mood states should be treated with caution.

In mothers who had their baby discharged from a neonatal unit, trait-anxiety was influenced by age, marital status and qualifications, their state-anxiety was influenced by age and mothering experience, and the magnitude of change in anxiety was influenced by mothering experience and delivery type. Multivariate analysis found the characteristics that influenced the magnitude of change in mood states in mothers from their baby's discharge from a neonatal unit to three months following discharge were delivery type, mothering experience and gestation at birth.

A comparison study of the extent of differences between mothers who had their baby discharged from a neonatal unit and mothers who were discharged home with their baby from a postnatal ward were fewer than expected. Past and present obstetric events were more discriminating than social factors. There were no significant differences between the two groups of mothers for their self-assessed level of confidence, baby related health worries, information needs or health care events experienced. Neonatal unit mothers had more contacts with health visitors than the postnatal ward mothers. Mothers who had their baby discharged from a neonatal unit were not more anxious or lower in mood than mothers who were discharged home with their baby from a postnatal ward. However, there were some significant differences in the magnitude of mood change between the two groups of mothers during the three months following their baby's discharge home.

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## **GLOSSARY OF TERMS**

<b>Antenatal</b>	Before birth
<b>Apnoea</b>	Cessation of breathing for 20 seconds or more
<b>Bilirubin</b>	Yellow pigment in blood derived from the breakdown of red blood cells
<b>Caesarean section</b>	The delivery of a baby through an incision in the abdominal and uterine walls
<b>Cerebral palsy</b>	Impairment of development of the nervous system
<b>Cerebrospinal fluid</b>	Fluid produced from vessels within the ventricles in the brain. An obstruction in the flow or reduced absorption leads to hydrocephalus
<b>Chronological age</b>	Baby's age from the actual date of birth
<b>Corrected age</b>	The age a preterm baby would have been if born on the due date
<b>Extremely low birth weight</b>	Birth weight less than 1Kg
<b>Fetal / Fetus</b>	The unborn baby from the eighth week of gestation until birth
<b>Forceps</b>	Instrument used to assist in the delivery of a baby
<b>Gestational age</b>	Time in weeks from the first day of the last normal menstrual period
<b>Gravida</b>	Pregnant woman
<b>Hydrocephalus</b>	Excessive accumulation of cerebrospinal fluid within the ventricles of the brain which may cause a rapid increase in head size
<b>Infant death</b>	Death in the first year
<b>Infant mortality rate</b>	Deaths under one year of age per 1,000 live births
<b>Interquartile range</b>	Middle 50% of the ordered observations with 25% above and below upper and lower limits respectively
<b>Intra ventricular haemorrhage</b>	A bleed into the ventricular system of the brain
<b>Intrapartum</b>	During labour, between the onset of effective contractions and delivery of the baby

## Glossary of terms continued

<b>In-utero</b>	Within the uterus or womb
<b>Jaundice</b>	Yellow pigmentation of the skin caused by raised levels of bilirubin in the blood
<b>Low birth weight</b>	Birth weight less than 2.5Kg
<b>Morbidity</b>	Relating to disease or abnormal condition
<b>Mortality</b>	Relating to death
<b>Multigravida</b>	A women who has had more than one pregnancy
<b>Multiparous</b>	A women who has given birth to more than one live or stillborn baby
<b>Multivariate analysis</b>	The interrelationship of three or more variables
<b>Necrotising enterocolitis</b>	A bowel disorder of multiple aetiology causing impaired blood supply to portions of the bowel. Perforation in the bowel may occur. A potentially fatal condition
<b>Neonatal death</b>	Death within 28 days of birth
<b>Neonatal mortality rate</b>	Deaths under 28 days of age per 1,000 live births
<b>Neonate</b>	A baby during the first four weeks of life
<b>Para</b>	Given birth to a live or stillborn baby
<b>Parity</b>	Number of previous live or stillbirths
<b>Perinatal</b>	The period from the twenty-fourth week of gestation to the end of the first week of life
<b>Postnatal</b>	After delivery of the baby
<b>Postpartum</b>	After delivery of the baby
<b>Preterm / premature</b>	Baby born before thirty-seven completed weeks of gestation (less than 259 days)
<b>Primigravida</b>	A women in her first pregnancy
<b>Primipara / primiparous</b>	A woman giving birth to her first baby
<b>Quartile</b>	Four equal portions of the total frequency 25% of observations are below the 1 <sup>st</sup> and above the 3 <sup>rd</sup> and between successive quartiles
<b>Stillbirth</b>	Baby born dead after 24 weeks gestation

## **Glossary of terms continued**

<b>Term</b>	A baby born from thirty-eight to forty-two completed weeks of gestation (259 – 293 days)
<b>Triage</b>	To sort or prioritise
<b>Trimester</b>	A third part of a pregnancy-a period of thirteen weeks
<b>Very low birth weight</b>	Birth weight less than 1.5Kg

## LIST OF ABBREVIATIONS

<b>A &amp; E</b>	Accident and Emergency Department
<b>C. section</b>	Caesarean section
<b>CESDI</b>	Confidential Enquiry into Sudden Deaths in Infancy
<b>CM</b>	Community Midwife
<b>EDD</b>	Expected date of delivery
<b>ELBW</b>	Extremely low birth weight
<b>GP</b>	General Practitioner
<b>HV</b>	Health Visitor
<b>IFS</b>	Infant Feeding Specialist
<b>IQR</b>	Interquartile range
<b>IVF</b>	In vitro fertilisation
<b>Kg</b>	Kilogram
<b>LBW</b>	Low birth weight
<b>LSCS</b>	Lower section Caesarean section
<b>MNNU</b>	Matched neonatal unit mother
<b>NNU</b>	Neonatal Unit
<b>ONS</b>	Office for National Statistics
<b>PNW</b>	Postnatal ward
<b>POMS-Bi</b>	Profile of Mood States Bi-Polar Form
<b>RCT</b>	Randomised controlled trial
<b>sd</b>	Standard deviation
<b>STAI</b>	Spielberger State-Trait Anxiety Inventory
<b>VLBW</b>	Very low birth weight

## **CHAPTER ONE**

### **INTRODUCTION TO THIS THESIS**

#### **THE BACKGROUND TO THIS STUDY**

##### **The mothers involved in this study**

The mothers who form the focus of this thesis gave birth to an early, small or sick baby who required special or intensive care around the time of birth. A neonatal unit (NNU) provides intensive and special care for newborn babies.

Premature birth and the admission of a newborn baby to a NNU have, for many decades, both been described in the literature as a life crisis event for parents (Caplan, 1960; Kaplan and Mason, 1960; Caplan et al. 1965; Benfield et al. 1976). These studies describe parents, and particularly mothers, as experiencing many losses and high levels of stress and anxiety in response to this crisis. The physical condition of their baby and the effects of the physical and emotional impact of their baby's admission to a NNU influence the post-partum experience of mothers (Hawkins-Walsh, 1980; Miles and Carter, 1983; Miles, 1989; Perehudoff, 1990; Affonso et al. 1992; Redshaw, 1997).

Although the experience and support needs of fathers who had early and sick infants are acknowledged, this thesis concentrates on the experiences and responses of mothers. Motherhood imposes complex change, diverse demands and constraints on women that are not reflected in fatherhood (Richardson, 1993; Woollett and Parr, 1997). However, it is also acknowledged that the father's presence or absence, attitudes and behaviours also impact on a mother's anxiety, mood and adaptation to motherhood (Bull, 1981; Summersgill, 1993; Richardson, 1993).

The physical and emotional responsibility of taking home a baby from a NNU can be overwhelming for mothers, whether this is following weeks of intensive care or a short but acute perinatal illness. After their baby is discharged home, many mothers report feelings of anxiety and lack confidence in their role as a mother and in their baby care skills (Gennaro, 1985; Gennaro, 1988; Brooten et al. 1988; Butts et al. 1988; Kenner and Wright Lott, 1990; Gennaro et al. 1990; McKim, 1993a; Padden and Glenn, 1997).

However, what has been less well explored is the effect of support interventions introduced to reduce anxiety and improve confidence and other mood states of mothers following their baby's discharge from a NNU (Edwards and Allen, 1988). Therefore this study will be located in the period after the baby's discharge from a NNU and will objectively measure the anxiety and mood states in response to specific support interventions.

**Are neonatal unit mothers different from other mothers?**

There is little disagreement about the crisis nature of the experience and the need for support for mothers who have their baby admitted to NNU. However, there is less certainty about the mothers' need for additional support following their baby's discharge home (Crnic, 1983; Gennaro, 1988; Redshaw, 1997). Therefore integral to this investigation, which focuses on mothers who had their baby discharged home from a NNU, is the question 'to what extent are mothers who had their baby discharged home from a NNU different from other new mothers?' This question needs to be asked at each stage of the investigation, in relation to the characteristics of the mothers, their experiences of early motherhood, and their anxiety and mood during the early weeks at home with their baby. Therefore, this study of NNU mothers will incorporate an internal 'bench mark' by including mothers who received standard postnatal care and were discharged home with their baby from a postnatal ward (PNW). This contemporaneous comparison or control group of mothers will enable the findings related to the NNU mothers to be interpreted within the context of all 'new mothers' following their discharge home from hospital.

**The aims of this thesis**

The principal aim of this thesis is -

- to determine the effect of specific interventions on the anxiety and mood states of mothers who had their baby discharged from a neonatal unit.**

The second aim of this thesis is -

- to identify the characteristics of the neonatal unit mothers that appear to influence their anxiety and mood states.**

The third aim of this thesis is -

- to explore the extent of differences between mothers who had their baby discharged from a neonatal unit and mothers who were discharged home with their baby following standard postnatal care.**

### **The process of the study**

#### **The scope of this study**

An important feature of this study is that the population includes all mothers who had their baby discharged home from a NNU rather than the more frequent focus of researchers on a sub-set of mothers (Gennaro, 1985; Gennaro, 1988; Brooten et al. 1988; McHaffie, 1989; Miles, 1989; McHaffie, 1990; Rajan and Oakley, 1990; Gennaro et al. 1990; Brooten et al. 1991; Oakley and Rajan, 1991; McKim, 1993a; McKim, 1993b; Stjernqvist, 1996).

Much of the clinical concern and financial resources for post discharge support have been focused on the mothers with the smallest or earliest babies or mothers with babies who have continuing medical or nursing care needs following discharge home. Although this practice has its origins grounded in a normative perception of greatest need and limited resources, it fails to acknowledge the potential impact of an extraordinary experience on all mothers who have their baby admitted and subsequently discharged from a NNU.

### **The support interventions**

The fundamental aim of the support interventions was to reduce anxiety and improve mood states of all mothers who had their baby discharged from a NNU. The purpose of the interventions was to support the mothers' role identity and sense of control through increased knowledge and facilitating their problem-solving and decision-making ability regarding their baby's health and care needs. Weiss (1976) suggested the essential components of crisis interventions were ego supportive, but firmly based in reality, with an emphasis on communication skills. Support interventions were therefore chosen which had the potential to enable and empower mothers to progress towards strengthening appropriate adaptive and coping mechanisms to deal with the present and future crises.

The two support interventions selected were:-

- 'Baby Check', a self-assessment scoring system devised to help parents assess the severity of acute illness in babies under six months of age (Morley et al. 1991a; Thornton et al. 1991b).
- 'Baby Helpline', which offered 24-hour telephone support and information specifically for parents who had taken home their baby from a neonatal unit.

These support interventions, which are described more fully in Chapter Two, were in addition to the standard post discharge care provided by the primary health care team.

### **The location of this study**

This study was located in a NNU on the south coast of England. This medium-large sized, busy NNU consists of 22 cots (six of which are designated for intensive care and 16 cots for special care) with approximately 500-550 admissions annually. Admissions to this NNU represent approximately 10% of live births at the hospital.

### **The Research Management Group**

The Research Management Group comprised of the researcher - a senior neonatal nurse, and non-grant-funded members who were a Consultant Neonatologist, an Epidemiologist and two nurse educators.

### **Roles within the Research Management Group**

The Consultant Neonatologist, the Epidemiologist and the two nurse educators were the grant holders for this study and details of the two grants obtained will be given in the appropriate methods chapters of this thesis.

The Epidemiologist had overall responsibility for the design of the study. The interventions selected resulted from a collaborative decision making process based on the fundamental requirement for universal support of all mothers following their baby's discharge from a NNU. The Consultant Neonatologist and the researcher instigated the inclusion of an integral comparison study. The researcher selected the standardised inventory outcome measures for anxiety and mood states. All decisions were discussed, approved and supported by all members of the Research Management Group.

The researcher designed the data collection tools, except the standardised inventories of anxiety and mood, and devised the underpinning philosophy, organisation, administration and provision of the telephone helpline intervention called 'Baby Helpline'. The researcher was also responsible for the development of the evidence-based protocols used by 'Baby Helpline'.

The researcher undertook all practical and administrative aspects of the research process including participation in data collection and a substantial part of the analyses. The Consultant Neonatologist and the Epidemiologist provided supervision and support for the researcher. The nurse educators performed advisory roles in aspects of the study not reported in this thesis.

### **The clinical role of the researcher**

The researcher for this study also has a part-time clinical role within the NNU. The aim of this role is to support and enable parents, usually mothers, to regain a sense of control within their personal situation based on enhancing their access to information. Therapeutic interventions are facilitated through individual and group contacts with mothers. Individual contacts with mothers occur during the antenatal period and whilst their baby is in the NNU. Group contacts involve parents before, during and after their baby's admission and discharge from the NNU. The researcher does not have individual contact with all parents but the group sessions are available to all parents with a baby in the NNU. However, any effect of the researcher's clinical role was likely to be equal across all NNU mothers. The clinical role of the researcher therefore should not compromise the findings of this study as the results pertaining to the effectiveness of the support interventions will be made on internal comparisons of anxiety and mood states amongst the participating mothers.

The following chapter presents the literature that supports the rationale for undertaking this study.

## **CHAPTER TWO**

### **RATIONALE**

#### **THE AIM OF THIS CHAPTER**

The purpose of this chapter is to review the literature that supports and underpins the aims and objectives of this thesis. This chapter will consider the contextual issues that have the potential to impact on the anxiety and moods of mothers following their baby's admission and subsequent discharge from a NNU. The literature described will explore the differences in pregnancy, childbirth and early motherhood experiences of mothers who have their baby discharged from a NNU and mothers who receive standard postnatal care and take their baby home with them from the PNW. This chapter will progress to describe the literature in relation to the worries and concerns which influence the anxiety and mood of new mothers following their discharge home from hospital. This chapter will also review the literature which supported the selection of the support interventions, 'Baby Helpline' and 'Baby Check'.

These perspectives therefore form the framework for this chapter that will be presented in five sections:-

Section One	Understanding the context
Section Two	A different beginning to motherhood
Section Three	The impact of the neonatal unit on mothers
Section Four	Influences on anxiety and mood states of mothers
Section Five	The interventions

These five sections of inquiry are not mutually exclusive and some issues will flow through several sections.

#### **SECTION ONE:      UNDERSTANDING THE CONTEXT**

#### **NATIONAL AND LOCAL PERSPECTIVE**

##### **The incidence of prematurity and low birth weight**

In 1995 there were 648,001 live births in England and Wales. Birth weight was recorded for 99.7% of live births of which 7.3% were low birth weight (LBW) (birth weight less than 2.5Kg) and 1.2% were very low birth weight (VLBW) and weighed less than 1.5Kg (Office for National Statistics, 1996b). In the same year in the study location District there were

5,524 live births (Office for National Statistics, 1996d). Of these live births, 7.2% weighed less than 2.5Kg (LBW) and 1.5% weighed less than 1.5Kg (VLBW) (Office for National Statistics, 1996c).

The Office of National Statistics (ONS) does not record live births by gestation therefore it is not possible to present a national picture of live premature births based on ONS data. However, in 1995 there were 5010 live births in the hospital where this study is located with 518 (10.3%) babies admitted to the NNU. Table 1 shows the admissions to the NNU by gestation at birth and birth weight.

**Table 1      Admissions to the Neonatal Unit 1995**

Babies admitted to the Neonatal Unit	Number (%)
<b>Gestation at birth</b>	
28 weeks gestation or less	49 (9.5)
29 – 32 weeks gestation	71 (13.7)
33 – 36 weeks gestation	133 (25.7)
37 or more weeks gestation	265 (51.2)
<b>Birth weight</b>	
1000g or less birth weight	37 (7.1)
1001 – 1499g birth weight	58 (11.2)
1500 – 1999g birth weight	83 (16.0)
2000 – 2499g birth weight	78 (15.1)
2500g or more birth weight	262 (50.6)
<b>Total admissions</b>	<b>518</b>

Table 1 shows the weight and gestation profile of admissions to the NNU for 1995. Forty-nine per cent of these babies were born prematurely/preterm and/or LBW, and of these 18% were VLBW and 23% were born at 32 weeks or less gestation (Department of Neonatal Medicine, 1996).

However, not all the babies admitted to the NNU were born early and/or small. More than half of the babies were born at 37 or more weeks of gestation and/or 2.50Kg or more birth weight. On the basis of gestation or birth weight alone, the majority of these mothers could have reasonably assumed their baby would not require admission to a NNU. Inevitably there would be an additional element of shock involved for the mothers of mature and well-grown babies who needed admission to a NNU.

Parents who have experienced an adverse perinatal event no longer have the luxury of feeling reassured or protected by the illusion that terrible things or bad luck 'happen to other people'. They have personal evidence that it can happen to them and their thoughts

may be troubled, even after discharge home, by the fear that 'lightning can strike twice'. It therefore seems likely that mothers who take their baby home from a NNU may experience anxiety about their baby's health and future survival in excess of that of other new mothers.

### **Neonatal mortality**

In England and Wales during the 25-year period between 1972 and 1997, the neonatal mortality rate (deaths under 28 days of age per 1,000 live births) fell by 70% from 11.5 to 3.9. However, the decline was not steadily progressive during that period. Between 1972-1988 the neonatal mortality rate fell by 59% compared with a fall of only 26% between 1988-1997 (Office for National Statistics, 1998).

In 1995, the local neonatal mortality rate was 5.6 per 1,000 live births representing 55 babies (Office for National Statistics, 1998). Of these, 26 babies died on the NNU where this study is located. Twenty of these babies died within one week of birth, their mean gestation was 26.25 weeks (range 22-40 weeks) and their birth weights ranged from 430g-3900g (median 815g). Six babies died after the first week of life and they had a mean gestation of 29.30 weeks (range 25-37 weeks) and their birth weights ranged from 717g-2310g (median 965g) (Department of Neonatal Medicine, 1996).

Given these local figures, on average every two weeks one baby dies on the NNU. Therefore many parents are exposed, either directly or indirectly, to the reality that even at the end of the twentieth century in Britain newborn babies die. This early contact with the reality of baby illness and death may adversely affect the confidence of mothers taking home their baby from a NNU and the fear of long term morbidity may influence their worries and concerns especially during the early weeks at home.

### **Infant mortality**

Discharge home from a NNU does not necessarily imply that life is assured. In 1995 in England and Wales, the infant mortality rate (deaths under one year of age per 1,000 live births) was 6.1 per 1,000 live births (Office for National Statistics, 1998). However, the infant mortality rates for the smallest babies born were considerably higher at 48.1 and 221.5 per 1,000 live births for LBW and VLBW babies respectively. The relative risk of infant death for LBW and VLBW babies, relative to all infant deaths, was 8 and 37 respectively (Office for National Statistics, 1996b). In 1995, the local infant mortality rate was 8.5 per 1,000 live births (Office for National Statistics, 1996c). A study of babies born at less than 28 weeks of gestation in the north of England found that one third of post

neonatal deaths in the first year of life occurred after discharge from a NNU (Tin et al. 1997). Given these statistics, there is no room for complacency amongst parents who take their baby home from a NNU.

### **Morbidity**

Although neonatal mortality has decreased in recent years, a study of 3220 preterm babies of less than 35 weeks gestation found the incidence of cerebral haemorrhage and infarction, hydrocephalus requiring shunts and necrotising enterocolitis unchanged between 1980 and 1991 (Cooke, 1992). At age eight years, learning difficulties, motor and behavioural problems have been reported in children of very low birth weight (Marlow et al.1993). However, difficulties arise with long term monitoring of preterm and LBW babies. Follow-up until the age of two years does not capture discreet educational deficits whilst assessment at eight years or more reports data which applies to redundant neonatal care practices. Additionally, as the child becomes older it becomes more difficult to adjust for the effects of social deprivation and other external influences (Roberton, 1993).

Recent literature suggests that cerebral palsy is not due to perinatal asphyxia (Nelson and Ellenberg, 1986; Blair and Stanley, 1988; Stanley and Watson, 1992). There is evidence of disability in 10-20% of surviving VLBW babies, with just less than half of those having severe problems (Escobar et al.1991). A review paper in 1997 cited a total incidence of moderate to severe cerebral palsy as 1.5 to 2.5 per 1000 live births with an occurrence 25 to 31 times higher in VLBW babies (Morrison and Rennie, 1997). A study in Western Australia also found a decrease in neonatal mortality rates for VLBW babies but increased survival brought an increase in cerebral palsy in this group of babies (Stanley and Watson, 1992). The authors speculated that either premature birth and cerebral palsy share a similar obstetric aetiology or the complications of immaturity are more apparent as more VLBW babies survive. A review of the outcome for extremely low birth weight babies (ELBW) (weighing less than 1000g at birth) found that even though the mortality rate increased with decreasing birth weight, the incidence of morbidity from major neurological sequelae did not (Nishida, 1993). However, Tin (1997) found that disability rates in babies born at less than 28 weeks gestation was double that seen in babies born at 28-29 weeks of gestation. Overall, surviving preterm babies have higher rates of cerebral palsy, hearing loss, visual impairments and intellectual disabilities than babies born at term. In addition, they experience poor growth and increased occurrence of childhood health problems (Knochles and Doyle, 1993). Therefore it appears to be entirely appropriate for the mothers of such babies to be concerned about their baby's health and development.

For parents taking home an early or small baby from a NNU there is usually a major shift in concern from the issue of life or death to the issues of normality and the quality of survival (Steele, 1987). Developmental and neurological outcomes cannot be confirmed in the short term and only become apparent over time. Mothers are therefore subjected to months of uncertainty and worry and it therefore seems possible that some mothers respond to this stressful situation with increased anxiety and fluctuations in mood during the early weeks at home with their baby following discharge from a NNU.

### **Characteristics of mothers who have their baby admitted to a neonatal unit**

An early review of the literature on the causes of low birth weight and preterm birth cited the probable causes as poor nutrition, smoking, excessive or lack of exercise, excessive psychological and occupational stress, noxious environment, previous Caesarean birth and previous termination of pregnancy (Hemminki and Starfield, 1978).

A comprehensive review of the epidemiology of preterm birth by Lumley (1993) concluded that, although conventional social and demographic factors associated with preterm birth, such as low maternal age, poor education and low social class, are evident across the range of extreme (20-27 weeks), moderate (28-31 weeks) and mild (32-36 weeks) preterm births, the strength of the association is small when compared with obstetric factors such as previous reproductive history, and medical and obstetric complications in the current pregnancy. This review also highlighted that current epidemiological research is considering the wider social influence of employment, physical workload, infection, drug and alcohol use and lack of social support as risk factors within the picture of low socio-economic status and its association with preterm birth.

Hoffman and Bakkeig (1984) found that low and high maternal age increased the risk of preterm birth. A study of first-time mothers in Sweden found that, in addition to obstetric factors, the risk of preterm and term small for gestation births was higher in older mothers, smokers and mothers who had a shorter period of education (Clausson et al.1998). In relation to admissions to a neonatal intensive care unit, increasing maternal age was identified as a risk factor that was exacerbated by smoking, although no independent effect of smoking was identified (Yüksel et al.1996).

In a study of psychosocial factors in the mothers of term and preterm babies, the mothers of preterm infants were 'more likely to be young, unmarried, black, and of low socio-economic status' than the mothers of term infants (Berkowitz and Kasl, 1983). This study

also found that exposure to life events during the first and second trimester and a more negative attitude expressed towards pregnancy desirability were also significantly greater for the mothers of preterm infants compared with the mothers of term infants.

Nordentoft et al. (1996) also found premature birth to be associated with psychological stress in mothers, not living with a partner, poor school education and smoking. They also found that intrauterine growth retardation of the baby was associated with the mothers poor school education, smoking, daily alcohol consumption and poor social networks. However, a study of admissions to a NNU found no difference in the proportion of mothers who smoked and those who did not (Yüksel et al. 1996).

Mercer et al. (1996) identified obstetric and medical factors in the current pregnancy which were significantly associated with an increased risk of premature birth. However in women who had previously given birth, race (black versus non-black), living alone, poor social environment (rather than low family income or poor home conditions), low pre-pregnancy weight and low body mass index were also significant factors in the current pregnancy associated with preterm delivery. In mothers who had not previously given birth, race, poor social environment and low body mass index were also significantly associated with an increased risk of premature birth in the current pregnancy.

In relation to previous obstetric history, Lumley (1993) reports the association between multiple miscarriage and subsequent extreme prematurity might reflect genetic or other problems linked to sustaining a pregnancy. Preterm birth is also associated with previous termination of pregnancy (Lumley, 1993; Zhou et al. 1999) and previous preterm birth (Hoffman and Bakketeig, 1984; Lumley, 1993; Mercer et al. 1996) and previous stillbirth (Papiernik, 1993; Meis et al. 1998).

Meis et al. (1998) also investigated the risk factors for indicated preterm birth and found obstetric and current pregnancy factors more predictive than social and demographic factors. A review of risk scoring for preterm birth concluded that, to date, attempts to define an effective predictive system have been largely unsuccessful (Shiono and Klebanoff, 1993). Therefore this thesis will explore the characteristics of mothers through:-

**objective (i) - to identify the characteristics of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

**objective (ii) – to discover if there were significant differences in the characteristics of mothers and babies within the four trial arm groups of the randomised controlled trial.**

**objective (iii) - to identify the mothers' characteristics that were associated with anxiety in mothers who had their baby discharged from a neonatal unit.**

**objective (iv) - to identify the mothers' characteristics that were associated with the change in anxiety over time of mothers who had their baby discharged from a neonatal unit.**

**objective (v) – to identify the mothers' characteristics that were associated with the mood states of mothers who had their baby discharged from a neonatal unit.**

**objective (vi) - to identify the mothers' characteristics that were associated with change in mood states over time of mothers who had their baby discharged from a neonatal unit.**

The local and national perspectives on the incidence, morbidity, mortality and maternal characteristics for premature and low birth weight babies who represent around half of the admissions to the NNU where this study is located have been reviewed. This chapter will now progress to consider the differences between the expectations and reality of pregnancy and childbirth for women who have their baby admitted to a NNU.

## **SECTION TWO: A DIFFERENT BEGINNING TO MOTHERHOOD**

### **EXPECTATIONS VERSUS REALITY**

#### **Acquired expectations**

#### **Normality and choice**

This section develops the theme of the altered reality of motherhood for women who have their baby admitted to a NNU, and how this might impact on their post discharge anxiety and mood states. Scopesi et al. (1997) describe childbirth as both a biological and cultural event which is a crucial experience in the lives of women. How these biological and cultural events are managed has a profound and lasting effect. In the last two decades maternity

care has undergone a process of 'de-medicalisation' (Department of Health, 1993; Scopesi et al.1997). This process of change has involved shorter periods of hospital-based care and greater emphasis on childbirth being a 'healthy, normal experience' rather than an illness requiring medical intervention. Integral to these changes has been the promotion of women-centred care with a partnership between health professionals and pregnant women facilitating greater emphasis on women having choices and enabling them to feel in control of their pregnancy and childbirth experience. However, some argue that accounts by women of their postnatal experiences have received scant attention by practitioners and researchers (Woollett and Nicholson, 1997).

It is against this 'de-medicalised' background of normality and expectations of choice and control that women who have their baby admitted to a NNU have such a contrasting experience to that of other new mothers.

### **Images from the media**

Although more than half the parents in an antenatal study reported that television had given them helpful information about babies (Delight et al.1991), the media rarely portray pregnancy or childbirth accurately. A study of British television 'soap operas' found that childbirth story lines involved unrealistically high maternal and perinatal mortality rates (Clement, 1998). Labour was depicted as quick and unpredictable with an inaccurately low use of analgesia. Clement found that pregnancies frequently ended with premature birth or delivery of a sick baby but there was usually some kind of resolution after a few episodes. This contrasts sharply with the reality of many weeks or months of uncertainty about the baby's outcome. These unrealistic images together with the media obsession with stories of a 'miracle baby weighing less than a bag of sugar' do little to support the development of appropriate expectations. Following their baby's discharge from a NNU, a study found 38% of mothers described media images of newborn intensive care painful (Affleck et al.1990a).

The stereotypical images of an attractive, radiantly happy mother, with the contented, beautiful, healthy baby, the supportive partner and smiling family which flood the media are wildly unrealistic (Nicolson, 1993; Weaver and Ussher, 1997). Promotion of these idealised images of motherhood leads to unrealistic expectations of baby care responsibilities and social support. These strong positive images leave many women unable to accurately anticipate the relentless demands of baby care or the support available to them and, for some, generate feelings of disillusionment, inadequacy and failure.

Pregnancy and baby care books all assume a birth at term of a well, healthy baby reinforcing expectations of normality and perfection (Health Education Authority, 1999; Health Promotion England, 2000). Scant attention is given by these books to complications during pregnancy, premature birth or abnormality and even less attention is paid by the reader as these negative events do not concern them as they 'happen to other people'!

### **Getting pregnant**

Becoming pregnant occurs by choice for some and by accident for others. Some who would choose to become pregnant experience difficulties in conceiving. Problems associated with conception are widespread but the actual prevalence is unknown, as many do not seek help (Sherr, 1995). Infertility can negatively effect body image, self-esteem, mood, sense of control and cause stress within partner relationships (Bernstein et al.1994). It has been estimated that infertility affects one in six couples (Hull et al.1985). The process of fertility investigations and treatments causes enormous stress, high emotional and financial investments and many disappointments for those who embark on that course. The excitement of a pregnancy achieved through *in vitro* fertilisation (IVF) may be over shadowed by the high-risk nature of the pregnancy. *In vitro* fertilisation is associated with higher rates of miscarriage, premature birth, low birth weight, perinatal morbidity and Caesarean birth for both single and multiple pregnancies (Saunders and Lancaster, 1989; Wennerholm et al.1991; Brandes et al.1992; Doyle et al.1992). In Great Britain between 1978-1987, 24% of IVF deliveries were preterm compared with 6% of natural conceptions. This high incidence of prematurity can be partially, but not entirely, attributed to the high rate of IVF multiple births of 23% compared with 1% of natural conceptions (MRC Working Group on Children Conceived by In Vitro Fertilisation, 1990). Just less than half of all multiple births are born prematurely and are therefore likely to require admission to a NNU (Lumley, 1993).

However, it is too simplistic to presume that stressful IVF treatment necessarily leads to high anxiety levels during pregnancy and early motherhood. Maintaining a state of viable pregnancy is the goal of IVF. When pregnancy has been achieved many women perceive their problems have been overcome and are blinkered to the possibility of future misfortune such as their baby's admission to a NNU.

Bernstein et al. (1994) reported that some women found the transition from infertility to pregnancy problematic. For the previously infertile, being pregnant did not necessarily

equate to having a baby. Anxiety, fear of failure and lack of identification with the role of mother competed with issues of denial and avoidance leading to insufficient emotional and practical preparation for taking home a baby.

In a review of the literature on psychosocial outcomes following IVF, the evidence relating to anxiety during pregnancy and IVF per se was inconclusive (McMahon et al.1995). Previous despair about infertility followed by the optimism, gratitude and high parental expectations associated with successful IVF treatment may even lead to an extremely premature live birth being regarded as a positive outcome rather than a crisis. Following years of infertility a live birth at any gestation, whatever the implications for the future, may mark a previously only dreamt of step into parenthood for some couples.

### **Staying pregnant**

When pregnancy is confirmed the doctor or midwife calculates an expected date of delivery (EDD). This date assumes a forty-week gestation period until the birth of the baby (although term is defined as between 38 and 42 weeks of gestation). The expected date of delivery achieves enormous importance for mothers even though it is estimated that only 5% of babies are actually born on this given date (Myles, 1981). All future plans and expectations are based on the EDD. Even when the pregnancy fails to complete the expected duration because of miscarriage, termination or preterm birth the EDD remains a highly significant date for mothers (Stillbirth and Neonatal Death Society, 1991).

Miscarriage, the spontaneous loss of a pregnancy within the first 24 weeks of gestation, occurs in approximately 20% of all known pregnancies (Smith, 1988). In subsequent pregnancies women who have experienced a previous unsuccessful pregnancy are more anxious about the possibility of another miscarriage and more worried about the birth or something being wrong with the baby than women who are pregnant for the first time or who had not experienced pregnancy failure (Statham and Green, 1994). It has been suggested that previous adverse obstetric events might be negatively associated with the adaptation of mothers to their preterm infant (Gennaro, 1985).

The infants born following a high-risk pregnancy, due to maternal, fetal or intra-partum factors, carry a higher risk than babies born following a low-risk pregnancy of requiring admission to a NNU (D'Alton and Grant, 1998). For women who have an adverse obstetric history or high-risk pregnancy, their worries and anxieties are realised by their baby's admission to a NNU. Therefore this study will explore if an adverse obstetric history

influences the anxiety and mood states of mothers following their baby's discharge from a NNU.

### **Being pregnant**

During pregnancy the focus of concern for most women is on 'being pregnant'. Body image is an integral part of self-concept and being pregnant involves an altered body image. In the first trimester, previously infertile women are more likely than other women to describe their body in negative terms (Bernstein et al.1994). The 'Leicester Motherhood Project' found that older rather than younger women were more positive about their body image in late pregnancy (Windridge and Berryman, 1996). Many women, but not all, look forward to looking obviously pregnant and the social considerations that accompany this state. Premature birth may occur before the pregnancy is really noticeable to others. Many women describe feeling 'cheated' out of looking pregnant and this loss contributes towards making it even harder for them to accept their pregnancy has ended abruptly and the baby in the incubator is really their baby (Oakley et al.1984). Unresolved negative feelings of loss associated with a shortened pregnancy and premature birth have the potential to impact on a mother's anxiety and mood states.

### **Leaving work**

In Britain, for women in employment, it is custom or ritual for colleagues to buy gifts and cards for the expectant mother and baby to mark her last day at work before commencing maternity leave. These ceremonies mark a rite of passage from 'working woman' to mother. When or if she recommences employment she will have gained a new identity as a 'working mother' (Richardson, 1993). The ceremonies also mark the beginning of a period of 'nest building' or practical preparation for the baby's arrival. When premature birth occurs, sometimes many weeks before the planned completion of work, all of these ceremonies and the benefits they confer are irretrievably lost.

### **Delivery**

A pregnant women is encouraged to develop a birth plan which states who she would like to support her during labour and the type of delivery preferred including her wishes regarding positioning and analgesia. When these expectations are transformed into reality, women achieve a greater sense of satisfaction and control over the birth of their baby. However, it has been suggested that antenatal perceptions of control and predictability during childbirth are unrealistic (Ryding et al.1998). When an obstetric high-risk situation develops these birth plans become secondary to interventions necessary to promote the

welfare or save the life of mother and/or baby. Many women describe feelings of failure at not achieving their birth plan and being totally 'out of control' from the moment emergency interventions become necessary. Some of the babies who result from these deliveries will require special or intensive care. Therefore mothers who are already emotionally challenged by childbirth have their sense of 'control' undermined further by their baby's admission to a NNU. Ryding et al. (1998) suggested that unplanned emergency Caesarean section and instrumental deliveries should be regarded as a marker for possible post-traumatic stress.

When the reality of the pregnancy or delivery does not match expectations many women describe their body as unreliable and feel betrayed by its inefficiency and inability to perform this 'normal' function of childbirth (Mercer, 1977; Borg and Lasker, 1982). Her perceived inability to carry her baby safely to term or to deliver a well healthy baby generates negative messages for many mothers about an unreliable or a dysfunctional body.

In 1995 in England and Wales, 3,597 babies were stillborn (a baby born dead after 24 completed weeks of gestation or more). Sixty-two per cent of stillbirths were born at 35 weeks or less gestation. Forty-five per cent (1,625) of stillbirths weighed less than 1.5kg and 52% of these were born at 24-27 weeks gestation. Even delivery nearer to term did not guarantee a live baby with 38% of stillbirths occurring in babies of 36 weeks or more gestation (Office for National Statistics, 1996b). Clearly, even though the majority of deliveries result in the birth of a live baby there is no room for complacency in childbirth.

### **After delivery**

On the PNW, women who have their baby admitted to a NNU are surrounded by 'successful' mothers who have sustained their pregnancy and produced a healthy baby at term (Mercer, 1977). For a mother with her baby in a NNU, it may be several days or even weeks before her baby's condition allows a first cuddle which, even then, may be accompanied by feelings of anxiety that the extra handling may compromise her baby's health. In addition, the intimacy of breastfeeding may be replaced by the indignity and the cold mechanics of expressing her breast milk into a jar! This contrasts sharply with the continuous bedside contact and opportunities for spontaneous cuddles and feeding experienced by other PNW mothers. Feelings of low self-esteem, isolation and a sense of failure are reinforced as it is almost impossible for NNU mothers to escape from the sights and sounds of healthy babies with their mothers on the postnatal ward.

### **Ceremonies of pregnancy and childbirth**

The rituals and social customs that surround pregnancy and childbirth reinforce the rite of passage to the new role identity of mother, contribute to the emotional adaptations and are reassuring to expectant and new mothers as they confirm normality and support expectations (Rubin, 1984). These rituals and ceremonies and the processes of adaptation to motherhood are frequently disrupted for mothers who have their baby admitted to a NNU.

It is custom and practice to shower a new mother with flowers, cards of congratulations and gifts for the new baby that confer praise and approval. However when a baby is admitted to a NNU, friends and relatives are frequently uncertain of how to respond appropriately. Even when medical and nursing staff do not consider that a baby is 'critically ill' many parents perceive that the risk of their baby dying is high. It is difficult for parents to comprehend that if their baby is sick enough to be admitted to an intensive care unit and surrounded by, even if not actually attached to, 'high-tech' equipment that their baby's life is not in the balance. Friends and relative have to grapple with the dilemma of whether they, or more importantly the parents, would wish to celebrate or mourn such an event. The uncertainty of life and death casts doubt over the appropriateness of some ceremonies that surround childbirth. Faced with this uncertainty of how best to respond people frequently do nothing. Failure by friends and relatives to acknowledge the birth of the baby or the degree of parental anxiety can result in irreversible damage to relationships and loss of social support (Borg and Lasker, 1982). Relationships can become strained if mothers perceive that those from whom they might have expected support have ignored such a major event in their life (Newsome, 1991). Any breakdown in social and family relationships is likely to have a negative impact on support networks following discharge home from a NNU.

Low self-esteem established during hospitalisation has the potential to negatively impact on the mood states of mothers during the early weeks at home. Many mothers describe feeling 'wretched' with 'an overwhelming sense of loss and failure' about their experiences of childbirth and early motherhood (Newsome, 1991). When self-esteem is low, decision making and problem-solving can seem overwhelmingly problematic and even seeking help can be difficult. This thesis will therefore explore the mood states of mothers, how self-confident mothers feel about baby care at home and from whom they seek help and advice during the early weeks at home following discharge from a NNU.

### **Transition to motherhood**

Motherhood has been extensively explored (Oakley, 1979; Oakley, 1980; Boulton, 1983; Nicolson, 1993; Richardson, 1993; Anderson et al. 1994; Brown et al. 1997; Green and Kafetsios, 1997). Raphael-Leff (1998) reminds us that the purpose of pregnancy is not only to create a baby but also to develop the mother. Pregnancy is preparation for motherhood during which many emotional and psychological tasks are undertaken (Rubin, 1984; Raphael-Leff, 1998). Woollett and Parr (1997) identified four important psychological tasks undertaken by new parents; making sense of childbirth, recovery from childbirth, feelings about and relations with the baby, feelings about self and changing relationships. Parents with a baby in a NNU often fall at the first task as frequently the only explanation for the birth of a premature or sick baby is 'just one of those things'!

The transition to parenthood is a complex experience and a time of enormous stress as both men and women adapt to new responsibilities and roles (Belsky and Pensky, 1989; Cox et al. 1993; Summersgill, 1993; Woollett and Parr, 1997). Although many of the feelings and experiences are similar for men and women, parenting impacts on women's lives to a far greater extent. The social and cultural construction and expectations of motherhood and fatherhood are vastly different. In western cultures, responsibility (and blame when it goes wrong) for child rearing invariably remains the prerogative of women. It is usually women who make career or education concessions and take on more responsibility for the health and well being of a baby than men (Steele, 1987; McBride, 1990). Mothers shoulder the responsibility for providing or organising childcare and respond to changing demands, especially during periods of ill health (Smith, 1991). Integral to motherhood is the (mandatory) notion of duty and self-sacrifice, putting the child first and being less self-centred (Weaver and Ussher, 1997). It is for these reasons therefore that this thesis will focus on the anxieties and mood states of mothers.

The experiences of pregnancy, childbirth and motherhood are complex and expectations evolve through a lifetime of learning and social influence (Richardson, 1993; Sherr, 1995). Most women develop their personal interpretation of 'mothering' based on their own experiences and memories of their own mother and of being nurtured. These memories may exert a positive or negative effect on a woman's own practice of mothering. However, there is evidence that the intergenerational cycle of poor mothering can be broken (Lichtenstein Phelps et al. 1998). However, a study has shown that both the mothers of

preterm and term babies perceive their child more negatively than their 'idealised child' (Bidder et al. 1974).

The notion of 'good-enough mothering' and the early emotional development of the baby being facilitated by the mother gradually influenced professional practice from the 1950s onwards (Winnicott, 1988). Winnicott suggested that the 'ordinary devoted mother' unconsciously, intuitively learns to interpret her baby's needs. Her ability to 'hold' the baby, both physically and psychologically, enables the baby to proceed with the essential processes of maturation.

Admission to a NNU frequently sabotages these early learning experiences for both mother and baby and would suggest that a mother's need for extra support would extend beyond her baby's discharge from a NNU. However, with greater involvement of mothers in the care of their baby these early learning experiences for mothers might occur during the baby's stay in a NNU. Is it possible therefore that by the time their baby is ready for discharge home the NNU mothers are not more disadvantaged than other mothers?

### **The myths of motherhood**

Most cultures view motherhood as an inevitable component of being a woman and a natural event that signifies a woman's attainment of adulthood (Nicolson, 1993; Coward, 1993; Richardson, 1993; Lee, 1997), and this view is expressed as early as adolescence (Beckett, 1986). Becoming a mother represents a rite of passage and entering a 'different phase of being' (Crouch and Manderson, 1993). Some women described a 'natural progression' into motherhood, which implied a biological event beyond their control, whilst others referred to the expectations of 'society' being fulfilled (Weaver and Ussher, 1997). An awareness of the finite nature of female fertility increases the social pressure exerted on older women to become pregnant before the opportunity is lost. Women who are unable to conceive are regarded with pity and those who choose not to have children are considered selfish (Richardson, 1993). In a modern society where womanhood and motherhood are inextricably linked, delivery of a baby prematurely is frequently perceived as a woman's failure to achieve either state successfully.

A study found that 91% of primigravidae considered the reality of motherhood to be different from their expectations (Oakley, 1980). First-time mothers report feeling challenged by being unprepared for the relentless demands of baby care, constant fatigue and lack of personal time (Mercer, 1986; Crouch and Manderson, 1993). Australian first-

time mothers described a 'conspiracy of silence' existing about the realities of motherhood (McVeigh, 1997). Weaver and Ussher (1997) identified 'shock' and the 'unexpectedness' of the reality of motherhood as clear themes affecting the adjustment to motherhood. This has also been found to be particularly true in older mothers (Berryman et al. 1995) and surprisingly, Nicolson (1993) found the same in multiparous women.

### **Postnatal depression**

The transition to motherhood is a major life event for women, which needs to be considered in a cultural, social and ideological context (Richardson, 1993). Most women experience the transition to motherhood as a positive period of adaptation achieved without destabilisation (Murray, 1992; Murray, 1993).

However, studies in both Britain (Cooper et al. 1988; Murray and Carothers, 1998) and America (O'Hara et al. 1990; Campbell and Cohn, 1991) have shown that a period of clinical depression, serious enough to disrupt daily living, occurs in 9 - 15% of women following childbirth. Other studies, however, put the incidence at nearer 5% (Cox et al. 1993; Wickberg-Johansson et al. 1996). However, Wickberg-Johansson et al. (1996) emphasised that 36% of these women had to highlight their mood state to health visitors before their depression was recognised. This disparity over the incidence rate supports the assertion that postnatal depression is a hidden disorder (Elliot, 1989). Whichever estimate of the incidence of postnatal depression is closest to reality, unplanned perinatal events, such as premature birth or admission to a NNU, are likely to disrupt the positive transition to motherhood and have a negative effect on mood and coping ability of mothers.

Postnatal depression and depressive symptoms during the perinatal period have been the subject of much research. Previous episodes of depression are regarded as a risk factor for postnatal depression (O'Hara et al. 1984; Atkinson and Rickel, 1984). Hormonal variations are also frequently cited as a cause of postnatal depression (Gard et al. 1986; Harris et al. 1989; O'Hara et al. 1991). Other major life events or crises, such as unemployment, death in the family, disruption in the relationship between partners or moving house may occur concurrently with pregnancy and childbirth affecting mothers' ability to cope (Pitt, 1968; Paykel et al. 1980; Kumar and Robson, 1984; O'Hara, 1986). If childbirth also involves the birth of an early, small or sick baby requiring neonatal intensive care the negative effects on the mothers coping ability may be compounded. In mothers of 'medically fragile infants' discharged from a NNU, 45% were found to be at-risk of depression (Miles et al. 1999).

A study investigating the social context of depression and the transition to motherhood suggested that postpartum depression should be seen as one end of the continuum of normal adjustments to motherhood (Lee, 1997). Contrary to the views expressed by Murray in 1992 and 1993, Lee asserts that new motherhood is a major life event that causes considerable adjustment problems for most women. She considers that high workloads, inadequate social support and unrealistic expectations contributed greatly to the distress experienced in early motherhood. Women have expressed their preference for greater emphasis on their need for support and understanding rather than the clinical labels of 'illness' and 'post partum depression' (Small et al. 1994).

Increased social support by health professionals during pregnancy has been shown to be significantly associated with better health outcomes in both mother and child at one and seven years of age (Oakley et al. 1996). However, midwife led debriefing to reduce depression in mothers following operative deliveries has been shown to be ineffective (Small et al. 2000).

A study investigating perceptions of pain tolerance, body image and attitudes towards parenting described 'salient issues' which might affect mood during the transition to motherhood (Anderson et al. 1994). They found more negative perceptions and attitudes in women with a depressive mood state, in particular lower maternal self-confidence and self-image. Positive attitudes towards self-image, baby care activities, ability to cope and a highly motivated need to seek information on baby care were seen in women with more positive moods. The birth of a premature or sick baby interrupts the processes involved with working through these 'salient issues' and leaves them unresolved and at greater risk of exerting a negative influence. With or without a clinical diagnosis of postnatal depression, the birth of an early, small or sick baby undermines a woman's self image.

The critical period during which symptoms of depression frequently occur is between two and three months post delivery (Cooper et al. 1988; Wickberg-Johansson et al. 1996). This identified vulnerable period for postnatal depression will therefore influence the intervention period selected to evaluate the effect of support interventions on the anxiety and mood states of mothers who had their baby discharged from a NNU.

It seems reasonable to conclude that some mothers who have their baby admitted to a NNU appear to be at increased risk of developing postnatal depression. Therefore this study will evaluate the effect of support interventions on the mood states of mothers following their baby's discharge from a NNU. However, to what extent are the mood states

of mothers who had their baby discharged from a NNU different from other mothers? This question will be addressed through -

**objective (vii) – to discover the level of mood states of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers who were discharged home following standard postnatal care.**

**objective (viii) – to discover the extent of change in mood states over time of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers who were discharged home following standard postnatal care.**

The literature reviewed in this section illustrates that the prospect of admission to a NNU plays no part in the normal expectations of motherhood. If the gulf between expectations, myths, and reality of motherhood leaves healthy women with healthy babies shocked and disillusioned with feelings of failure and inadequacy, the toll on women who have a baby born early or sick and have a vastly altered reality from even normal expectations must be profound.

This thesis will therefore attempt to discover more about the anxiety and mood states of this apparently vulnerable group of mothers following their baby's discharge from a NNU and evaluate the effect of support interventions on their anxiety and mood states.

### **SECTION THREE: THE IMPACT OF THE NEONATAL UNIT ON MOTHERS**

#### **THE NEONATAL UNIT ENVIRONMENT**

##### The emotional environment

###### **Feelings of stress**

The intense, roller-coaster emotional atmosphere of a NNU is highly charged. The high levels of stress and distress in mothers of sick and preterm babies can interfere with communications between parents, health professionals and other potential sources of information and support (Miles and Carter, 1983; Steele, 1987; McHaffie, 1989; McHaffie, 1992; Redshaw, 1997; Padden and Glenn, 1997).

Miles and Carter (1983) identified three potential sources of parental stress; situational conditions (such as the severity of baby's illness, uncertainty of outcome), personal/family factors (such as personality trait, concurrent life events and previous experiences) and environmental stressors (such as the sights and sounds of the NNU and the baby's

appearance and behaviour). They further highlight that parental exposure and response to stress is a changing phenomenon linked to changes in the infant's condition, the availability and adequate utilisation of internal, external and environmental resources. This thesis will therefore attempt to explore if their baby's discharge home resolves anxiety in mothers during the early weeks following discharge from a NNU.

Shields-Poë and Pinelli (1997) explored variables associated with parental stress in the NNU. They found that mothers were more anxious than fathers three weeks after their baby was admitted to a NNU. High trait-anxiety, higher educational level and high stress scale scores were associated with mothers' increased anxiety. High stress scores were associated with perceptions of the severity of infant illness, their baby's appearance, interactions with their baby, sights and sounds of the NNU and staff behaviour and communications.

Selye (1974) describes a non-specific biophysical and psychological response of the body to demands made upon it and which is applicable to mothers who have their baby admitted to a NNU. A response to stress can be adaptive or maladaptive and is influenced by the individual's ability to utilise previous successful coping skills and their ability to develop new coping mechanisms. Although some stress is necessary for survival, excessive or prolonged stress that exceeds the individual's capacity to adapt may disturb the equilibrium causing physical or psychological disease (Selye, 1974). Even though stressors, such as the baby's discharge home, can be positive as well as negative all stressors require personal adaptation and readjustment. Individual perceptions of stress vary. The degree of effect imposed by a stressor on an individual depends on three factors; the individual's perception of its power, the conditioning factors brought by the individual to the situation and the coping mechanisms available to the individual to facilitate adaptation and readjustment. Selye's theory of stress underpins the recognition and understanding of the need for individualised family care and support within a NNU.

### **Feeling anticipatory grief**

Benfield et al. (1976) identified 'anticipatory grief' as the response of parents of critically ill term and LBW babies who survived. The parents described a grief response similar to that of parents whose baby died. A significant negative correlation between the anticipatory grief score of mothers and their self-confidence in their ability to care for their baby following discharge home was also found. Mothers of preterm infants have also reported

less confidence in their mothering abilities than mothers of term infants (Gennaro, 1985).

From this literature therefore evolves -

**objective (ix) – to discover the level of confidence in aspects of baby care expressed by mothers who had their baby discharged from a neonatal unit, and to compare this with mothers discharged home following standard postnatal care.**

### **Feelings of loss**

Grief responses are also evident in parents of babies who are not perceived as critically ill by health professionals. Forty years ago Kaplan and Mason (1960) recognised grieving in mothers who delivered their baby prematurely. Many authors (Kübler-Ross, 1970; Parkes, 1975; Lewis and Bourne, 1989; Leon, 1990; Worden, 1991; Schiff, 1992) have comprehensively described the characteristics of grieving. Grieving can therefore be observed, to a greater or lesser extent, in the mothers of small, early or sick babies admitted to a NNU. Parents, especially mothers, grieve for the loss of their expected pregnancy, delivery of a healthy baby at term and early motherhood experiences.

Feelings of failure, loss of self-esteem, sadness and depression associated with grieving for lost expectations and experiences by mothers may not be completely resolved by the time their baby is ready for discharge from the NNU. The effect of these negative feelings may affect a mother's perceived ability to cope with the demands and challenges of baby care at home. The degree of acceptance, resolution or adaptation to the grief experienced, with or without the complication of postnatal depression, may adversely influence the growth of the relationship between mother and baby and the baby's developmental attainment (Cohen and Beckwith, 1979). This thesis will therefore evaluate the effect of support interventions on the mood states of mothers following their baby's discharge from a NNU.

### **Crisis response**

The birth of a premature baby has been described as a 'violation of the normal sequence of psychological and physiological processes that culminate in the full-term delivery' (Sammons, 1980). Kaplan and Mason (1960) described the birth of a premature baby as an 'acute emotional crisis'. When the source of the crisis is external, and causes a disturbance to the state of equilibrium, this forces mothers to respond to a situation for which they have no previous experience, no psychological preparation and no personal control and demands new coping mechanisms (Hancock, 1976).

Kaplan and Mason (1960) described four psychological tasks that must be addressed for successful coping with the crisis and the development of a sound basis for a healthy mother-infant relationship. The first task is preparation for the loss of the baby whose life is at risk and withdrawal from the relationship already established with her wished-for baby. This period of anticipatory grief involves a complex turmoil of emotions centred on hope that the baby will survive whilst simultaneously preparing for the baby's death. The second task for a mother is to acknowledge her failure to deliver a well healthy baby at term. Observed anticipatory grief and depression are evidence of mothers struggling with these tasks. These reactions are normal and usually continue until the baby's chances of survival seem secure to the mother. The third task involves the resumption of the previously interrupted process of developing a relationship with the baby. At the point a mother dares to believe that her baby will survive (which is frequently reached long after doctors and nurses consider the imminent threat of death ceased to exist) she begins to revive the process of psychological, emotional and practical preparation for taking her baby home. The fourth psychological task is to understand how the special needs, growth patterns and characteristics of a premature baby differ from that of a term baby. Although this work focuses on prematurity, the maternal responses and tasks are equally applicable to all mothers who have their baby admitted to a NNU.

Steele (1987) described the four phases of the adaptive process for parents of critically ill infants and summarised them in practical terms as 'giving-in', 'letting go', 'hanging-on' and 'taking hold'. Recognition of these processes by nurses is essential to facilitate parents working through these processes and to enable them to prepare for taking their baby home.

Mothers of babies admitted to a NNU frequently appear numbed and shocked. A period of 'emotional suspension' has been described as accompanying recognition of the crisis as if the mother were outside or separated from its implications (Weiss, 1976). Normal physiological, psychological and emotional defence mechanisms become weakened during a crisis. Outside influences challenge the self-esteem and individuals feel vulnerable, threatened and out of control. As stated earlier, Weiss (1976) suggests that effective crisis interventions are ego supportive, but firmly based in reality, with an emphasis on communication skills. The aim of support interventions should be to reduce stress by strengthening and developing appropriate adaptive and coping mechanisms to deal with the present and future crisis. The support interventions to be evaluated in this study, 'Baby Check' and 'Baby Helpline', fulfil the criteria established by Weiss.

### **Worries about not bonding with their baby**

In the 1970s, the period immediately following the baby's delivery was termed the 'sensitive period' and was regarded as 'crucial' to the development of the 'bond' between mother and baby and being a good mother (Klaus and Kennell, 1976). The term 'bonding' was popularised by the media and widely adopted by the general public and health professionals and led to the unrealistic expectation that all mothers will experience an intense emotional bond with their baby within a few hours of birth. Some mothers are unable to cuddle their baby immediately after birth because of maternal ill health or the baby's admission to a NNU. The 'sensitive period' and 'crucial' elements of the Klaus and Kennel message caused, and still causes, feelings of anxiety and guilt which fuel fears in mothers of failing to bond with their baby or of being a poor mother. The bonding process may be hindered if mothers cling to the idealised expected baby and do not begin a successful resolution of their grief and accept the reality of their actual baby (Benfield et al. 1976).

The crucial nature of the sensitive period proposed by Klaus and Kennel was later criticised as being extreme and not rigorously tested or proven (Goldberg, 1983; Lamb, 1983; Sluckin et al. 1983). Goldberg suggested that early contact between mother and baby was 'potentially beneficial' rather than 'crucial' whilst Lamb asserted that although there were immediate benefits to early mother-infant contact, the prophecy of long term detrimental effects due to lack of early contact was less reliable.

As long ago as 1983 Sluckin et al. advised caution in the concept of bonding becoming doctrinaire and authoritarian. They suggested that for mothers the threat of failure to bond rapidly with their baby and the implication of dire consequences if perinatal circumstances were sub-optimal, combined with worries about their baby's health and survival were sufficient in themselves to inhibit bonding!

Mothers, with a baby in a NNU, also have to overcome the barriers to bonding imposed on them by separation from their baby and the physical and emotional environment of a NNU. The need for parents, especially mothers, to have early and frequent contact with their baby and involvement in their baby's care has long been recognised (Budin, 1907) but has frequently been ignored by health professionals (Crosse, 1945; Lundein and Kunstader, 1957; Crosse, 1966).

This fear of failing to bond with their baby adds another burden of guilt to mothers who have their baby admitted to a NNU that may not be resolved before discharge home thus impacting on the mothers' ability to make a successful adaptation to motherhood and transition to the role of mother. Therefore this study will explore the extent of differences in confidence of mothers who had their baby discharged from a NNU and mothers who received standard postnatal care and were discharged home with their baby from a PNW.

### **Uncertainty about their role identity**

A study of role perception and response to stress following preterm delivery found that parents frequently described feelings of failure, guilt and shame (Jeffcoate et al. 1979). These negative feelings undermine confidence and self-esteem. Feelings of inadequacy and inferiority can stem from the mothers' inability to perform baby care activities as skilfully and efficiently as 'expert' nurses (Klaus and Kennell, 1982). Careless use of 'ownership' terminology by NNU staff further induces role uncertainty for mothers (Mercer, 1977; Steele, 1987). Miles (1989) found that 'parental role alteration' was the second greatest source of stress in a NNU. A lower sense of mastery or control was found to be significantly associated with symptoms of depression in mothers of 'medically fragile infants' (Miles et al. 1999). Failure on behalf of staff to seek a mother's opinion on baby care and management issues, except when obliged to obtain permission or formal consent for procedures was found to cause resentment (Kenner and Wright Lott, 1990).

Tension can arise between parents, particularly if the duration of admission has been long, and neonatal staff when parents begin the process of 'taking hold' as described by Steele (1987). As parents begin to assume some of the responsibility for decision making and problem-solving for their baby's care needs, neonatal nurses need to facilitate this process of preparation for the parents to take their baby home rather than feeling threatened by their loss of control.

Jeffcoate et al. (1979) found that only 50% of preterm mothers felt confident in handling their baby at the time of discharge compared with the majority of term mothers after a much shorter period of hospital care. However, Gennaro (1985) found no significant correlation between the age of a preterm baby at discharge from a NNU or the severity of infant illness and maternal adaptation to motherhood. Kenner and Wright Lott (1990) found that mothers of term and preterm babies discharged from a NNU commonly expressed feelings of powerlessness, frustration and confusion about their parenting role in the NNU. This lack of confidence by mothers has implications in terms of their baby care activities,

problem-solving and decision making in the early weeks following discharge home. Therefore the support interventions selected for evaluation in this study promote and support the mother's role identity by facilitating her decision making and problem-solving skills in relation to her baby's health care needs.

### **The physical environment**

#### **Sights and sounds of a neonatal unit**

Although many mothers described the physical environment of a NNU in positive terms, especially mothers of babies who required intensive care, Redshaw (1997) found that a substantial proportion of mothers perceived the NNU in negative terms. Many parents describe feeling 'totally overwhelmed' or 'intimidated' on entering the unfamiliar world of a NNU into which they have been suddenly and unexpectedly catapulted. Neonatal intensive care units are usually over-crowded with towering stacks of advanced medical technology, efficient health professionals and sick babies, all collaborating in a seemingly hostile atmosphere of urgency and crisis (Avery and Litwack, 1983; Sammons and Lewis, 1985; Redshaw, 1997). The effect of a high technology environment on unfamiliar people is shown in Figure 1.

**Figure 1 Impact of high technology on the individual (Kornfield, 1972).**

#### **Geographical confusion**

Where can I go?

Where should I go?

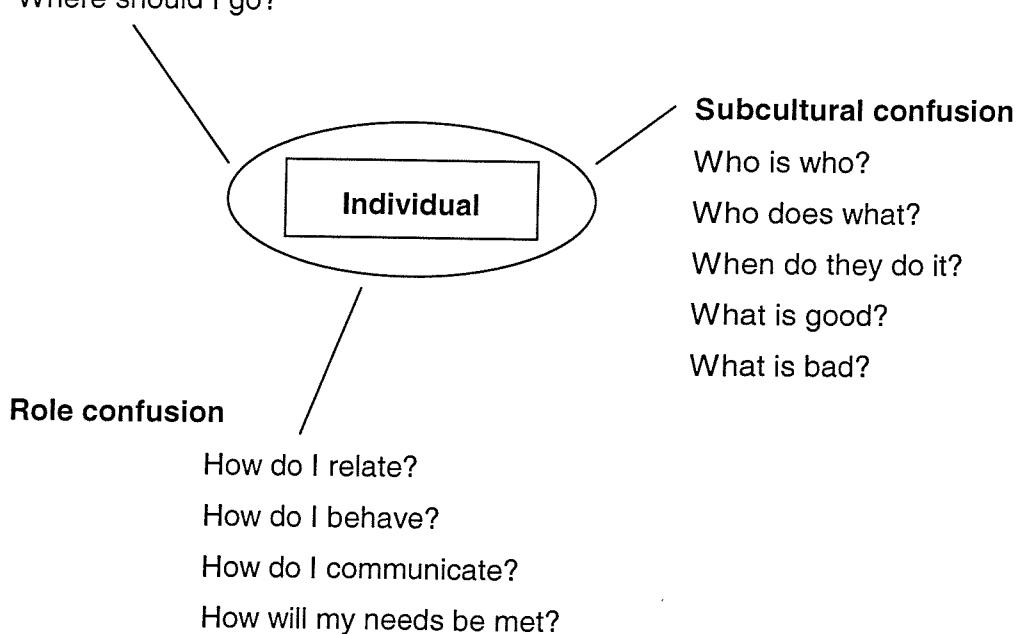


Figure 1 illustrates the geographical, role and sub-cultural confusions that can result from sudden and unexpected exposure to a high technology environment such as a NNU. The constant bustle of activity, intrusive sounds, heat and sense of urgency within a NNU can be confusing, disturbing and disorienting and only tolerated for short periods by some parents. Discussions between staff and parents have to compete with the cacophony of sounds created by intensive care equipment and are frequently interrupted by alarm calls. This seemingly chaotic but controlled atmosphere raises levels of frustration, anxiety and stress in parents, staff and babies. Parents frequently express concern about 'being in the way' and move to the periphery or leave the NNU (Jeffcoate, 1979). These stressors impact negatively on establishing the role identity of mothers and reduce opportunities for interaction with their baby, the effects of which may extend beyond discharge home. Environment related distress has been shown to be higher in mothers of babies requiring ventilation support and mothers of babies born at a lower gestation than other mothers (Meyer et al. 1995).

Environmental stressors on parents have been described as both positive and negative and may be termed 'contextual stimuli' (Roy, 1976). Parents, like babies, suffer simultaneously from environmental sensory stimuli bombardment and deprivation (Lawson et al. 1977; Field, 1990). Mothers may perceive the environment as negative as it represents a constant reminder that their baby is poorly enough to require intensive care whilst simultaneously maintaining positive thoughts that the environment is contributing to keeping their baby alive (Affonso et al. 1992). Mothers have been reported as finding the NNU environment as significantly more stressful than fathers (Perehudoff, 1990).

### **Making the environment parent friendly**

The last decade has seen a proliferation of life support and monitoring equipment surrounding sick babies maintaining an extraordinary 'hi-tech' appearance and atmosphere. During the same period, tremendous efforts have been made to 'soften' the physical, clinical appearance of the intensive care area and surrounding facilities to make them more 'parent friendly' and comfortable (Gardner Cole et al. 1990). Interventions designed to reduce parental stress within the NNU have been targeted at alleviating environmental stressors as well as enhancing personal resources available to parents to reduce the effect of stressors induced by situational and personal/family factors (Miles and Carter, 1983).

Some studies suggest that previous exposure to a NNU may diminish environmentally induced stress (Caplan et al. 1965; Hawkins-Walsh, 1980). It has also been observed that parents become acclimatised to the environment over time (Perehudoff, 1990). Is it possible therefore that the negative impact of the environment felt by parents at the time of their baby's admission to the NNU might become 'neutralised' and no longer a source of anxiety long before their baby's discharge home?

The recent proliferation of television documentaries about special care babies, 'docu-soaps' and hospital-based dramas may have the added advantage of subliminally introducing the public to the NNU environment (Miles, 1989). However, it seems likely that the messages emitted by these programmes are only internalised by those who already have personal experience and know that it can happen to them.

### **Appearance and behaviour of babies**

Physical environmental stressors not only refer to the technological sights and sounds but also the infant's physical appearance and behaviour (Perehudoff, 1990) and the painful procedures that the baby has to undergo (Affonso et al. 1992). The appearance and behaviour of preterm or sick babies is very different from the full term healthy baby imagined by the parents during the pregnancy. Affonso et al. (1992) found that mothers of preterm babies interviewed within four days of birth regarded their baby's appearance and behaviour as a negative stressor. Miles (1989) found that the baby's appearance and behaviour caused the greatest stress for parents in a NNU. Even babies born at term who are sick may look shocking in terms of their alteration in colour, tone and behaviour. The realities of neonatal intensive care mean that even just to touch their baby mothers have to negotiate a tangle of wire and tubes. The effects of illness or drugs may cause the baby to be unresponsive to touch or, conversely, respond negatively. Mothers may become reluctant to touch their baby fearing they may cause deterioration in their baby's condition or disconnect important wires or tubes.

Many of these negative stressors persist in a modified form even after the baby's discharge from a NNU. Babies born very early or small may not look or behave like their contemporaries and normal expected family life may be punctuated by repeated hospital or clinic follow-up visits, administration of medications or treatments and painful investigations, tests or examinations. Bidder et al. (1974) found that mothers who had both a preterm and a term baby perceived their child born prematurely to be the weaker regardless of the birth order.

### **Centredness of care**

The physical and emotional environment of a NNU and the climate of parent support are influenced by the philosophy of care adopted by the medical and nursing staff (Nyqvist and Karlsson, 1997). The patterns and style of communication between parents and staff can mitigate or exacerbate parental anxiety, stress and support needs (Hawkins-Walsh, 1980; Miles, 1989; Affonso et al. 1992).

Theoretical models help explain and facilitate our understanding of the psychological processes involved in pregnancy, childbirth and motherhood and how these relate to mothers of sick babies. Theories are consistent and necessary for knowledge based understanding which goes beyond intuition (Popper, 1973; Polanyi, 1973). Models are representations of concepts that facilitate a better understanding. Theoretical models allow generalisations to be applied to a variety of situations and reactions to be anticipated (Sherr, 1995).

The models of care can be patient/family, staff or institution centred. Maguire (1985) suggests that staff centred care may be responsible for failures to identify psychological disturbances created by medical conditions or experiences especially where the focus of care is on physical well being. Wickberg-Johansson (1996) also found this to be true in mothers with postnatal depression. Nichols (1984) found that this theory of centredness of care helped to provide an explanation for a range of situations, adjustments and reactions that can also be applied to the neonatal intensive care setting. Nichols further suggested that doctor-nurse centredness of care could interfere with the recognition and understanding of the emotional needs of the seriously ill or parents of a baby on a NNU. However, it should be highlighted that the baby does not necessarily need to be regarded as seriously ill by health professionals for parents to be extremely worried and fearful of the future (Jeffcoate, 1980).

A study of the emotional response of mothers to preterm birth found that the mothers of the sicker babies perceived that they had received more support than the mothers of less ill infants (Pederson et al. 1987). Furthermore, Nichols (1984) suggests that behaviours such as confusion, reluctance to ask questions, passivity and anger were stimulated by factors specific to the institution, which contribute towards the emotional trauma and generate these responses in those entrapped within the system.

When mothers were asked to recall their memories of the NNU, those who encountered problems with neonatal staff were more likely to recount painful memories of the NNU than the other mothers (Affleck et al. 1990b). However, the mothers who perceived they had greater personal control over their baby's care and recovery retrospectively had more positive memories of the NNU.

Given the high levels of anxiety, confusion and assault to any sense of control imposed on mothers by the physical and emotional environment of a NNU, it is reasonable to suppose the impact of their experience would remain active during the early weeks following their baby's discharge home. It also seems reasonable to speculate that NNU mothers might have more or different worries, concerns, information and support needs following discharge home than other mothers with a new baby who have not had to endure this experience.

Therefore the effect of specific support interventions, 'Baby Check' and 'Baby Helpline' on the anxiety and mood states of mothers who had their baby discharged home from a NNU will be evaluated through –

**objective (x) – to determine the effect of 'Baby Helpline' and 'Baby Check' on anxiety of mothers who had their baby discharged from a neonatal unit.**

**objective (xi) – to determine the effect of 'Baby Helpline' and 'Baby Check' on the change in anxiety over time of mothers who had their baby discharged from a neonatal unit.**

**objective (xii) – to determine the effect of 'Baby Helpline' and 'Baby Check' on the mood states of mothers who had their baby discharged from a neonatal unit.**

**objective (xiii) – to determine the effect of 'Baby Helpline' and 'Baby Check' on the change in mood states over time of mothers who had their baby discharged from a neonatal unit.**

**Do acute responses to admission to a neonatal unit persist after discharge home?**

Mothers of preterm babies have been shown to be significantly more anxious and depressed before their infants discharge home from a NNU than at nine months following discharge (Brooten et al. 1988). Anxiety before their baby's discharge was not related to

their marital status, age, education, parity, socio-economic status or length of their baby's stay in the NNU. However, depression was significantly greater in multiparas than in primiparas and significantly less in mothers whose infant remained in a NNU longer than in mothers of shorter stay babies. Hostility decreased over time but there was no significant difference between discharge and at nine months. Anxiety, depression and hostility were not related to maternal age at discharge or at nine months. However, this study also found that there were no significant differences in anxiety, depression or hostility in a sub-set of mothers between their baby's admission and discharge from the NNU which implies that the care the mothers received was possibly not supportive of these mood states.

A study of anxiety and depression in the mothers of LBW and VLBW babies showed a marked decrease in anxiety and depression in both groups of mothers from birth to the time of their baby's discharge home (Gennaro et al. 1990). At the time of discharge, anxiety and depression in the mothers of LBW and VLBW babies were not related to the severity of baby illness. There was no significant difference in either anxiety or depression between the mothers of LBW or VLBW babies at five months after discharge although the magnitude of change in anxiety and depression was significant for all mothers. However, although there was no significant difference in the overall amount of anxiety and depression experienced by the LBW and VLBW mothers, the pattern of their change in anxiety and depression over time was different.

A three month follow-up study of mothers of preterm babies following discharge from a NNU also showed that mothers who were more anxious had better problem-solving abilities (Gennaro, 1985).

A study of anxiety and depression in the mothers of term and preterm infants found that in the first postnatal week mothers of preterm babies were significantly more anxious and depressed than the mothers of term babies (Gennaro, 1988). However the differences in anxiety and depression were not related to the severity of illness in the preterm babies. Anxiety and depression decreased over the seven weeks of the study. Neither parity nor delivery type were associated with the decrease in anxiety or depression over time. There was however, a temporary increase in anxiety and depression at week five for the preterm mothers and at week four for the mothers of term babies. In a study of mothers who had both a preterm and a term baby Bidder et al. (1974) found that mothers recalled being more anxious and less confident at home with their preterm baby than with their term baby.

Low postnatal emotional well being has also been linked to high levels of antenatal anxiety in mothers of term babies (Ball, 1994).

McHaffie (1990) found that the majority of mothers were positive in their anticipation of their baby's discharge home from a NNU and felt confident about handling their baby. However, they also expressed concerns about their own ability to care for their baby at home and about their perception of their baby's vulnerability. Immediately after discharge home the mothers expressed feelings of insecurity and lack of confidence.

Following their baby's discharge from a NNU, mothers who had redefined their experience as having had some personal gain or believed that there was a purpose to the crisis reported significantly more positive mood, less intrusion by or avoidance of disturbing thoughts about their baby's NNU experience than other mothers (Affleck et al. 1985). Pederson et al. (1987) found that just prior to their baby's discharge from a NNU almost one quarter of mothers were worried about their baby's survival and over half of the mothers anticipated the need for 'special care' for their baby after discharge home.

We have seen from the literature cited that the contextual issues which surround admission to a NNU are predominately negative and have the potential to promote anxiety. However, many of the responses described are acute emotional responses to a crisis situation. Perehudoff (1990) suggested that parents acclimatise to the NNU environment over time. Therefore during the length of stay in the NNU, is it possible that time allows emotional adjustments to be established and some resolution and acceptance of the acute events to occur? In contrast to other new mothers, the time their baby spends in a NNU also enables mothers to recover from the emotional and physical exhaustion of childbirth before embarking on the full burden of baby care at home. In addition, the acute situational stressors that related to the baby's appearance and illness will have resolved before discharge although the uncertainty of the long term outcome may persist for some mothers.

Crnic (1983) found no differences in the stress, social support or satisfaction with parenting between mothers of preterm infants and mothers of full term infants one month after discharge home.

When a baby is discharged from a NNU it is a time of high positive emotion for the mother, even though it is combined with anxieties about the future (Steele, 1987). Many preterm

babies are discharged home before their expected date of delivery, which affirms great progress and achievement on behalf of the baby and generates positive emotions in the mother. The possibility exists therefore that these positive experiences around the time of discharge may ameliorate some of the acute negative emotions experienced by mothers during the period of admission to a NNU. In addition efforts to 'soften' the clinical environment and promote family centred care are aimed at reducing anxiety and enhancing positive support. Effective discharge planning on a NNU should also focus on the practical and emotional preparation of mothers to care for their baby at home.

Therefore if the care of the baby and family have been effective, the possibility exists that by the time their baby is ready for discharge, mothers who have their baby discharged home from a NNU experience no more or less anxiety or low mood states than other new mothers. The objectives that evolve from these issues are -

**objective (xiv) – to discover the level of anxiety of mothers who had their baby discharged from a neonatal unit, and compare this with mothers who were discharged home following standard postnatal care.**

**objective (xv) – to discover the extent of change in anxiety over time of mothers who had their baby discharged from a neonatal unit, and compare this with mothers who were discharged home following standard postnatal care.**

This section has reviewed the factors that may influence the impact of the emotional and physical environment of a NNU on mothers. The following section will consider the factors that may influence the anxiety and mood of mothers following their baby's discharge home from a NNU.

#### **SECTION FOUR: INFLUENCES ON ANXIETY AND MOOD STATES OF MOTHERS**

##### **FOUNDATION FOR THE WORRIES AND CONCERNS OF MOTHERS**

###### **Sudden infant death syndrome**

Most mothers of new babies will express concerns and worries about the risk of sudden infant death or cot death. One might suppose that many more share these worries but are unable to express them. However, the risks are much greater for babies who have been admitted to a NNU (Department of Health, 1996).

The Confidential Enquiry into Stillbirths and Deaths in Infancy (CESDI) (Department of Health, 1996) which reported on sudden deaths in infancy identified families, babies and circumstances associated with increased risk. Those at greatest risk were babies of low birth weight, short gestation and multiple births. In addition, low income, poor or over-crowded housing, young mothers, high number of births (especially in women under 25 years of age), single and unsupported mothers and a recent move of house were all identified as increased risk factors. Most, but not all, of these risk factors can be found in higher concentrations in mothers who have their baby admitted to a NNU compared with other mothers.

The risk of sudden infant death increased as birth weight decreased. The death rate for babies with a birth weight of less than 1500g was ten times higher than babies weighing 3500g or more at birth (Office for National Statistics, 1996a).

It has been suggested that early recognition and treatment of sick babies might reduce the severity of the illness and prevent some deaths (Stanton et al. 1978; Stanton et al. 1980; Cameron and Williams, 1986; Hoffman et al. 1988; Department of Health, 1996). However, others found that neither major nor minor signs of illness had a predictive value for sudden unexpected death in infancy (Gilbert et al. 1990).

Although most mothers are good at recognising when their baby is 'not quite right', they are less skilled at interpreting the severity of illness and judging when it is appropriate to seek attention from health care professionals. In addition, the general practitioner to whom they take their baby may also be inexperienced in recognising serious illness in infants (Cole et al. 1990). The 1996 CESDI report (Department of Health, 1996) specifically recommended 'Baby Check', to help parents assess the severity of illness in babies under six months of age and offers guidance for appropriate help-seeking action.

Therefore, many of the factors associated with admission to a NNU also appear to be synonymous with increased risk factors for sudden infant death. It is therefore not surprising that the elation of mothers who have their baby discharged home from a NNU is tempered by increased anxiety compared with mothers of term, healthy born babies (Brooten et al. 1988). The anxiety generated by the fear of cot death supports the selection of 'Baby Check' as an appropriate support intervention for evaluation with this vulnerable group of babies and their mothers.

### **The vulnerable baby**

The concept of 'vulnerable child syndrome' referred to children whose parents were told, or they perceived, that their child was going to die as a result of serious illness or accident and then subsequently recovered (Green and Solnit, 1964). These children were later observed to have a 'constellation of disturbances' such as separation difficulties, over concern with their body, inappropriate behaviour and under achievement at school. The authors hypothesised that acute life-threatening illness in early life resulted in disturbances in the parent-child relationship and the child's psychosocial development.

As described earlier, anticipatory grief is a response observed and described by parents in relation to premature birth and critical illness in the newborn (Caplan, 1960; Benfield et al. 1976). When unexpected recovery occurs, if this grief reaction is not completely aborted and totally dispelled, dysfunctional thoughts and behaviour can become established. Following the child's recovery, some parents described feeling that their child was on 'tenuous loan'. Green and Solnit (1964) suggested the children were considered by their parents, 'for reasons not founded in reality,' to be particularly vulnerable to serious illness, accident or even death during childhood.

The 25 cases described by Green and Solnit (1964) have been viewed as extreme examples of the wider issue of how individuals understand their health needs and how they evaluate and act upon symptoms of illness (Levy, 1980). Levy (1980) interviewed 750 parents about their decisions on how and when to seek medical care for their children. The study found that parental fears that their child was especially vulnerable or threatened by illness were recurring concerns, which accounted for many of their requests for medical care. Underpinning parental worry appeared to be the fear of a recurrence of a previous illness long since resolved. Other parents explained their disproportionate anxiety in less tangible terms such as the child being 'so young' or 'so small'. Bidder et al. (1974) also found that mothers perceived their preterm born child to be weaker than their term born child. Levy (1980) also recognised the 'premium baby,' born after long periods of infertility or recurrent perinatal deaths as a predisposing risk factor. In 40% of the cases studied there was no medical basis for the parental perception of vulnerability.

Obviously, not all parents of children who survive life-threatening illness develop the 'vulnerable child syndrome'. Green and Solnit (1964) hypothesised that past or concurrent experiences within the family may predispose to the development of the syndrome. They identified such factors as prematurity, previous infertility, miscarriages, stillbirth or

childhood death, poor obstetric history, handicap, postnatal depression, congenital abnormality or social disadvantage as predisposing to vulnerable baby syndrome. Recollection of the previous sections of this chapter indicates that all of these factors can be applied, to a greater or lesser extent, to many of the graduates of neonatal intensive care units.

In a follow-up study of vulnerable children, 21 out of 22 mothers recalled their child's initial illness as 'very severe' and many commented that they thought their child might die during that illness. However, physicians rated the severity of illness in 11 of those cases as 'mild' and the remainder as either 'moderate' or 'severe'. No significant differences were found between the vulnerable children, siblings and age-matched controls for mothers' present concerns for the child or the child's behaviour (Costanza et al. 1968). Although the findings of Costanza et al. (1968) did not confirm the observations of Green and Solnit (1964), they concurred with the notion that following perceived life-threatening illness some 'vulnerable parents' might react abnormally to future illness in their child.

Levy (1980) also found that parents of perceived vulnerable children made significantly more requests for medical care and were less satisfied with those medical care episodes than parents who did not perceive their children in this way. The statistical significance of this finding persisted even when the children were separately assessed as 'medically vulnerable' and 'not medically vulnerable'. This study will therefore consider the frequency and satisfaction with health professional contacts by mothers who had their baby discharged from a NNU compared with mothers who had standard postnatal care. Evolving from these issues therefore is -

**objective (xvi) – to identify the level of satisfaction with present sources of professional health information and support expressed by mothers who had their baby discharged from a neonatal unit, and to compare this with mothers discharged home following standard postnatal care.**

### **Assessing the severity of illness in babies**

During the first six months of life babies are more at risk of developing serious illness or dying than at any other time in childhood (Office for National Statistics, 1998). However, this is also the period when babies commonly experience many minor illnesses. Babies demonstrate a multitude of non-specific signs which may indicate a minor, self-limiting illness or a potentially serious, even life-threatening illness (Hewson et al. 1990). The task of interpreting these signs is extremely difficult for both parents and health professionals.

Recognition of these non-specific but significant signs is dependent upon skilful history taking from the parents rather than on physical examination of the baby (Stanton et al. 1978; Stanton et al. 1980). Stanton et al. (1978, 1980) reflected that few parents appreciated the importance of these non-specific signs as indicators of illness or markers of deterioration. Others have recommended that 'detailed and specific questions' about each symptom should be asked with note taken of the duration and degree of disturbance caused by the symptom (Thornton et al. 1990). Experienced nurses on a telephone helpline have been shown to have the necessary skills to undertake this type of probing history taking (Marklund and Bengtsson, 1989).

Poor parental social and assertiveness skills and their failure to utilise available health services appropriately were also found to be factors in babies dying from recognisable disease (McWeeny and Emery, 1975). Some mothers therefore may feel more enabled to seek help from a telephone helpline initiated by staff from a NNU with whom they are familiar.

Potential and actual illness in babies is a recurring source of concern for mothers of new babies especially those recently discharged from a NNU. Pridham et al. (1982) showed that illness was the major reason for mothers seeking help and the majority sought help from doctors or nurses. Mothers of preterm babies identified information about how to recognise illness in their baby as information that they wanted but did not receive (McKim, 1993b).

The lack of expertise by mothers to assess the severity of illness in young babies together with issues of vulnerability and 'premium baby,' and the increased risk of sudden infant death would appear to be a recipe for increased anxiety and low mood states in mothers who had their baby discharged from a NNU. The question therefore arises, do mothers of babies discharged from a NNU, and by definition, previously early, small or sick, have more health related concerns about their baby than other mothers? From this question evolves the following objective -

**objective (xvii) – to identify the actual baby health care events experienced by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

## BABY CARE ISSUES CAUSING CONCERN FOR MOTHERS

### Expressions of concern, worry and anxiety

Differentiation between worries, concerns, information needs and anxieties is difficult, subjective and varies between individuals. A mother's choice of one descriptive word over another may infer a hierarchy of emotion attached to the issue or may reflect linguistic habit. As mothers interchange and use all of these words there is no added value attributed to, for example, a worry over a concern. The interchangeable use of worries, concerns and anxieties is also reflected in the literature (Chavasse, 1878; Adams, 1963; Bull, 1981; Pridham et al. 1982; Harrison and Hicks, 1983; Smith, 1989). Therefore throughout this thesis expressions of anxiety, worry or concern about baby care by or about mothers will be regarded as synonymous.

### First-time mothers

The physical and emotional responsibility of taking home a new baby from hospital is always daunting for mothers (Woollett and Parr, 1997). Many women feel shocked, unprepared and totally overwhelmed by the relentless demands of a new baby and for the reality of baby care activities (Mercer, 1986; Crouch and Manderson, 1993; Weaver and Ussher, 1997; McVeigh, 1997). First-time mothers tend to be more awkward in handling their baby and more anxious about their care taking ability. The responsibility for constant infant care can challenge the self-confidence of new mothers (Crouch and Manderson, 1993). Tulman and Fawcett (1991) found that self-confidence in personal ability to cope and satisfaction with the role of motherhood were closely correlated to functional status. However, Sherr (1995) cautions against examining quality of mothering experiences via infant characteristics such as weight gain, health, feeding or sleeping patterns. This 'baby monitoring' approach suggests a hidden agenda of seeking for the perfect mother with a perfect baby.

Premature birth, and the possibility of subsequent admission to a NNU, is more common in primiparous women over the age of twenty years (Lumley, 1993). In addition, at two days post delivery, birth order has been shown to affect anxiety, the mothers of term first-born babies had a higher state-anxiety than the mothers of later-born babies (Kochanevich-Wallance et al. 1988). It appears important therefore to take account of mothering experience when developing the research methodology for this study.

Studies of the actual experiences of primiparous women indicate that at one month post delivery mothers' concerns centred around the baby, lack of personal time, feelings of

incompetence and fatigue due to lack of sleep (Mercer, 1986). Sleep deprivation frequently begins during pregnancy and labour and the cumulative effect of postnatal sleep loss impacts at four weeks post delivery (Kalil, 1987). It will be recalled that Gennaro (1988) observed a temporary increase in anxiety and depression in mothers of term and preterm babies at four and five weeks respectively after delivery. Crouch and Manderson (1993) found that the effects of lack of sleep were demonstrated by loss of concentration, irritability and fatigue. However, another study found that at six weeks post delivery maternal functional ability and level of satisfaction with motherhood were not influenced by whether the baby slept through the night or not (Tulman and Fawcett, 1991).

A study of forty primigravida mothers, half of whom had LBW babies, identified five main areas of maternal concern (Adams, 1963). Feeding, bathing, crying and care of the umbilicus were the subjects generating the greatest number of questions by mothers in both groups. The 'other' category included concerns about hiccups, bowel function, rashes, when to first take the baby outside and sleeping. The mothers of the LBW babies had more questions anticipating care at home. Even though the mean birth weight in this group was not especially small, the mothers made frequent reference to their size. This anxiety about size may have been responsible for the increase in anticipatory concerns. Both groups interpreted the baby's behaviour as a sign of their skill or lack of it. Crying for no obvious reason was perceived as a failure of good mothering. Interestingly, others found that with more experience, mothers attributed crying to a fretful baby rather than a lack of their skill (Pridham et al. 1982; McHaffie, 1990).

### **New mothers**

A new baby requires mothers to address a complex mixture of practical baby care issues and psychological readjustment and adaptation to motherhood (Adams, 1963; Oakley, 1979; Bull, 1981; Pridham et al. 1982; Harrison and Hicks, 1983; Smith, 1989; Weaver and Ussher, 1997). Crouch and Manderson (1993) identified that new mothers had concerns regarding the organisation and reorganisation of life around a helpless and demanding baby and the need to develop manageable daily routines. Although fatigue is regarded as inevitable for mothers, it should not be discounted as a significant source of stress and distress for new mothers which has the potential to adversely affect the quality of early mothering experiences (Campbell and Cohn, 1991).

Studies on the concerns of new mothers frequently cite 'baby care activities', the nature and type of baby demands, infant feeding and lack of experience as sources of maternal

worries (Adams, 1963; Pridham et al. 1982; Smith, 1989; Schmied and Everitt, 1996; Weaver and Ussher, 1997).

Term and preterm parents interviewed at one and four weeks following discharge from a NNU indicated that they considered support necessary for the acquisition of parenting skills and support was regarded as positive by parents when it reaffirmed their control in a situation (Kenner and Wright Lott, 1990). Although these parents regarded the NNU staff as potential sources of information and support they indicated they received little support or preparation for discharge home. These parents expressed the need for more support with feeding, normal infant care, decision making and lifestyle changes in order to ease the stress experienced following discharge home. Kenner and Wright Lott (1990) found that mothers of both term and preterm babies discharged from a NNU expressed concern about common baby care issues of feeding, sleeping patterns, rashes, elimination and temperature control.

McKim (1993a), in a study of 56 mothers of high-risk premature babies, found almost half of mothers perceived the first post discharge week at home difficult. The degree of difficulty experienced was significantly negatively related to decreasing birth weight, decreasing gestational age, length of stay on the NNU and apnoeic episodes whilst in hospital. In another study mothers who perceived their baby as less difficult also perceived themselves as more confident (Zahr, 1991). It has been shown that low self-confidence and increased levels of anxiety can adversely interfere with a woman's adaptation to motherhood (Pond and Kemp, 1992). However, in an earlier study of mothers of preterm babies Gennaro (1985) found that neither anxiety nor problem-solving ability were significantly related to maternal adaptation to motherhood.

May (1997) describes the process through which mothers of preterm LBW babies, 4-11 months after discharge home from a NNU, searched for normalcy. Searching for normalcy included 'learning caregiving', 'maintaining vigilance for progress', 'normalizing' through comparison with babies born at term, 'going alone with the caregiving burden' and 'help-seeking'. Mothers initially sought normalcy for their infant in terms of health and development and for themselves through a return to a family lifestyle that did not centre on a sick or vulnerable child.

A study from Wales hypothesised that a mother will have more concerns for her premature baby than her term infant and that these concerns extend up to 2 or 3 years of age (Bidder

et al. 1974). However, this study of twenty mothers found that the only statistically significant finding associated with these concerns was the concept of 'strong-weak'. Mothers who were anxious about their premature baby later viewed the child as weak. The periods of significant anxiety were immediately following birth and at discharge home. Following discharge from the NNU, mothers who were anxious about handling their early baby also later viewed them as weak. Mothers who had little support at home also tended to regard their early child as weak. Although this study does not support the idea that a premature birth leads to permanently altered mother/child relationships it does indicate that efforts should be focused on reducing anxiety at crucial periods such as immediately after birth and following discharge home.

A study of preterm and term babies found that both mothers and fathers of preterm babies had lower interaction scores at three and twelve months, possibly due to lower expectations, than the parents of term babies (Harrison and Magill-Evans, 1996). This perception of weakness and lower expectations links with the concept of the vulnerable baby syndrome discussed earlier in this chapter.

Adams (1963) found that lack of confidence was common to all new mothers at home regardless of their postnatal experiences. For some mothers there appears to be a conflict between dependence on the NNU for support and guidance with regard to meeting their baby's health care needs and the sense of relief and independence conferred by discharge from the NNU (Newsome, 1991). This may in part be due to infant behaviour changes caused by previous experiences, maturation and environmental changes (Als and Brazelton, 1981; Daws, 1989). Infant wake-sleep and feeding patterns change frequently. In previously ill or preterm babies sleep patterns may be very irregular allowing limited opportunities for mother and baby interaction. Frequent feeding demands by the baby may lead to maternal exhaustion and offer little positive feedback about mothering skills. A review of parent-infant interaction in full-term and preterm infants concluded that 'there is probably no amount of early contact that can overcome all the interactive difficulties in preterm dyads' (Goldberg, 1978). Preterm infants were noted to be more difficult to look after even following discharge home and they had more frequent minor illnesses than the full-term group. Mothers of preterm infants have to wait longer than their full-term counterparts for signs of growth and development and positive reinforcement of their mothering skills with smiles, achievement of milestones and sleeping through the night. These continued consequences of immaturity do little to build confidence and self-esteem in mothers of preterm babies.

Mothers of preterm babies who indicated that they needed information, which they did not receive, were more anxious and less confident about baby care than other mothers (McKim, 1993b). In the same study, mothers expressed a need for more specific information from neonatal staff about infant health, growth, development, crying and feeding, especially information about colic and 'spitting-up'.

Thirty-four percent of mothers of LBW babies who responded to a postal questionnaire indicated that issues relating to feeding, immature sucking reflex, sleepy baby, small frequent feeds through the day and night, were major practical problems (Rajan and Oakley, 1990). Bathing and handling a small baby was also a practical problem for 10% of these mothers along with finding appropriately sized clothes and nappies. Another practical problem identified that had associated health concerns was the difficulty imposed by travelling on public transport with a small baby to frequent clinic and hospital follow-up appointments. Their health related worries included avoiding or coping with illness and infections, keeping the baby warm enough, weight gain and 'anxiety over real or imagined breathing problems'. This thesis will also explore the worries and concerns of mothers from a practical baby care and health perspective.

Pridham et al. (1982) asked mothers to keep a diary of their day to day experiences for the first three months of life. Although individual accounts were extremely variable, themes and patterns clearly emerged i.e. growth and development, issues of temperament, baby care, parenting, stressful events, illness and behaviour. The importance and frequency of some issues changed over time. Mothers reported an equal number of stressors and supports as well as stressors and supports in all categories. Parity did not influence the number of concerns reported although first-time mothers did seek help 1.5 times more often than experienced mothers. Illness was the major reason for mothers seeking help and 62% of help was sought from doctors or nurses. In both groups, as the number of baby related concerns increased so did referral to non-medical sources of help. This indicates that there are many more issues of concern to mothers than come to the attention of doctors and nurses. It is therefore reasonable to suppose that mothers of babies discharged from a NNU, and by definition, previously unwell, might have even more baby health concerns than other new mothers. However, the problem for the NNU mothers is that the usual sources of advice and information available to other mothers may not be able to give appropriate information for ex-NNU babies and those giving the advice may be unaware of the context which underpins the concern.

The data collection method used by Pridham et al. (1982) (asking mothers to record their experiences, worries and concerns in a diary) had an advantage over the more frequently used methods of interview or questionnaire. Diary keeping enables contemporary description of their worries and concerns over a period of time and not merely a snapshot of their experiences or relying on recollection. A daily record approach is more likely to reflect the mercurial pattern of moods and experiences during the early weeks of motherhood. This data collection method will therefore be considered for this study.

The importance of support in relieving the strain and stresses of the early weeks of motherhood is greatly valued by new mothers (Mercer, 1986; Crouch and Manderson, 1993). Pond and Kemp (1992) suggested that the level of antenatal confidence could be a predictor of postnatal confidence and attachment. McVeigh (1997) reports that 'mothers seem to need appropriate information and advice as well as social support following the birth of a baby'. This suggests that information based support interventions such as 'Baby Helpline' and 'Baby Check' are appropriate interventions to be evaluated by this study.

The concerns of mothers regarding the care of their new baby have changed little over the years. In the 19<sup>th</sup> century book 'Advice to a Mother' similar questions are raised by mothers although the advice given has, to a greater or lesser extent, changed! (Chavasse, 1878). This seems to imply that many of the worries and concerns expressed by mothers are inherent to the context and situation and it appears possible that no amount of information or support could relieve them completely. However, do mothers who had their baby discharged home from a NNU have more worries and concerns than other mothers? This question will be addressed through -

**objective (xviii) – to discover the worries and concerns expressed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

## **GETTING HEALTH INFORMATION AND SUPPORT**

### **Influences on help-seeking behaviour**

Help-seeking behaviour is a complex issue that can be viewed from anthropological, sociological and psychological perspectives. Anthropologists distinguish between the roles of 'helper' and 'help-seeker' within social networks, sociologists differentiate between help-seeking from lay, informal sources and seeking formal, professional advice whilst the

psychologists regard help-seeking behaviour as a coping mechanism and adaptation to stress (Gourash, 1978).

Early research suggests that the majority of people who encounter problematic or crisis events do seek help (Lowenthal et al. 1975). Increasing age and race are the principle factors that differentiate between those who do and those who do not seek help (Gurin et al. 1960). Individuals usually seek help in the form of information or support from family, friends and neighbours before contacting professionals or relief agencies (Litman, 1974). Gurin et al. (1960) identified a link between particular types of problem and sources of help, spouses were the main resource for worries and friends the primary helpers with emotional concerns. In a study of social support during pregnancy and childbirth 143 women cited spouse/partner, parents, siblings, other relatives and friends as being available for support before health professionals (Tarkka and Paunonen, 1996). However, none of those mothers had their baby admitted to a NNU. This study aims to discover if mothers who take home their baby following discharge from a NNU demonstrate similar patterns of help-seeking behaviour as other new mothers.

Social networks can impact on help-seeking behaviour in several ways. The social influences might be to absorb sufficient stress to remove the need for help, to offer sufficient support to obviate the need for additional professional help, to act as directors towards professional agencies and to express negative, value laden messages about seeking help from the referral agencies (Gourash, 1978). The cultural influences on accessing health professional help are universal (Van der Stuyft et al. 1996). An American study considering factors influencing maternal contact with physicians and nurses identified relevant issues as existing maternal values and perception of help use, available resources and perceived problem-solving ability (Pridham et al. 1994).

When individuals feel threatened by adverse events their coping behaviour in the way they process information can be altered. There are two aspects to this altered behaviour, firstly the extent to which individuals seek out or 'monitor' information about the threat and secondly the extent to which they avoid or psychologically 'blunt' threat related information (Miller et al. 1988). Individuals can be both high or low monitors and high or low blunters (Miller, 1987). Monitoring and blunting behaviours are easily observable in parents who have a baby in a NNU.

Miller et al. (1988) showed that high monitors were more concerned than low monitors about being treated with kindness and respect and sought reassurance. High monitors also wanted more information and interventions such as medical tests or new prescriptions than low monitors. However, high monitors were less inclined to play an active role in their care than low monitors. Indeed, twice as many high monitors than low monitors preferred to play a completely passive role in their own care. This suggests that high monitors demand more information, counselling and investigations to reduce uncertainty and stress rather than enabling them to take control of their care. In general terms, it is suggested that doctors tend to underestimate patient need for information and overestimate their need to actively participate in their care (Strull et al. 1984). However, recent societal change and increased expectations in terms of personal responsibility and control in relation to health may challenge this 'overestimation'.

Seeking and receiving information is a two way process. A disparity between the fervent information needs of women in labour and the variable practices of staff to give information has been reported (Kirkham, 1989). Information blocking by health professionals occurred through tactics of deflection and creating barriers to effective communication. This may be an attempt at self-protection by staff to avoid intellectual or emotional exposure. Kirkham (1989) also noted a class distinction in information seeking and giving. Information was less likely to be given to women of lower social class and they were regarded as disruptive when they sought information.

### **Health information and support from the primary health care team**

#### **Community midwife**

The community midwife routinely visits new mothers at home until the tenth postnatal day (although visits can continue until the 28th postnatal day if either mother or baby are unwell). This daily, home based, source of support, information, guidance and reassurance is denied to most mothers who have their baby discharged from a NNU. The majority of babies going home from a NNU will exceed ten days of age and mothers usually have their daily postnatal check at the hospital when they visit their baby and therefore miss the opportunity for home visits by a community midwife. The continuity of antenatal and postnatal care given by community midwives is therefore lost to those who deliver early, small or sick babies.

### **Health visitor**

The health visitor takes the lead in the primary health care team support from the eleventh postnatal day. After many weeks or months of being surrounded by 'medical and nursing experts' on a NNU the first encounter for mothers with the primary health care team requires a huge adjustment on behalf of mothers. Mothers who perceived the health visitor to lack knowledge and understanding of previous events expressed dissatisfaction with the support that they received, an increased sense of isolation and an undermining of their confidence (McHaffie, 1989). The routine of home visits by the health visitor or going to the baby clinic may reassure some mothers that the extraordinary events following the birth of their baby are in the past and family life can now be more as they had anticipated. Alternatively, the 'ordinariness' of primary care baby surveillance may seem, to some mothers, to negate the extraordinary level of worry and anxiety they have endured and continue to have about the baby's future development. When health visitors detect emotional problems in the postnatal period their most common response is to increase the number of home visits (Briscoe, 1989). However, does the number of contacts with a health visitor equate to the perceived support received by mothers? This thesis will therefore explore the number of contacts mothers have with the primary health care team and seek assessment of their level of satisfaction with those contacts.

A survey of 420 mothers with babies aged up to 18 months considered the issue of accessibility by mothers to health visitors (Farley, 1993). Access was seen as an important issue for mothers with 60% wanting health visitors to be present at clinics at all times and 58% wanting them to be available for telephone consultations. Interestingly, only two in five mothers felt that home visits were important. Despite an expectation of telephone contact, three quarters of the mothers interviewed reported never speaking with their health visitor on the telephone. However, there appeared to be some evidence of targeting telephone support by health visitors. Of the mothers who had been contacted by telephone at least once a month, 30% were first-time mothers and 25% had babies under one year of age. Health visitors traditionally work office hours with home visits and clinics being core activities. This may result in reduced availability for unscheduled consultation when problems arise.

### **General practitioner**

General Practitioners will see sick babies at home or in the surgery, however they rarely see seriously ill babies (Cole et al. 1990). The average general practitioner, with a case load of two thousand patients, might (depending on their geographical location) only

expect to see approximately two very preterm babies annually. This does not enable them to develop or maintain a knowledge base or expertise with this particular patient group. Mindful of the many thousands of pounds and incalculable parental stress already invested in an ex-NNU baby's survival, many general practitioners are reluctant to embark on home management of a sick baby and frequently arrange admission into hospital at the first sign of even minor illness. This action risks the generation of a 'sickly baby' label for the infant which can become the accepted mind set for both parents and health professionals which may adversely affect their perception of the baby's developmental potential in sickness and in health. Therefore a health care initiative, such as 'Baby Check' which helped to identify appropriate admissions to hospital would be supportive to both parents and general practitioners.

### **Constraints on the primary health care team**

Neonatal intensive care is a dynamic speciality. It is therefore unrealistic to expect members of the primary health care team to keep up to date with progress and developments in this highly specialised area.

Maternal confidence in the primary health care team may be undermined if the health professionals display little understanding of the baby's previous medical history or management. This lack of knowledge is magnified in the parents' perception compared with their own 'expert' knowledge of neonatal pathologies, treatments and jargon acquired during weeks of continual exposure. Mothers have expressed concerns when the primary health care team admit freely that they have little experience of preterm babies. Although truthful, this frank admission did little to inspire confidence in their ability to provide reliable health information related to their baby or enable mothers to feel well supported (Newsome, 1991).

Doctors participating in the general practitioner training programme no longer gain experience on the NNU where this study was located. Therefore some local general practitioners are not in a strong position to provide information and support for other members of the primary care team or mothers.

Although the primary health care teams are ideally the key providers of health information and support for mothers in the community this may be a source of stress for those health care professionals who have little experience of this population of mothers and babies.

Early break downs in the relationship between parents and the primary care teams are regrettable. As babies mature out of prematurity, the primary care teams become the experts in child health and development and are the initial contact for all other health services. It is extremely important therefore, that the interventions initiated by this study are supported by and supportive of the primary care team and promote positive relationships between families and community health professionals.

### **Other sources of health information and support for mothers**

#### **The use of the telephone in health care**

One of the major challenges for the providers of health care is to match the limited resources to increasing client health care and information demands. Increased accessibility to health information for the public is admirable and complements with a general increase in health consciousness and motivation for self help and control in health issues. In the present climate of enthusiasm for new initiatives to improve the quality of health care and enhance consumer satisfaction there is also a need to reduce the number of hospital admissions, out-of-hours calls to general practitioners and the inappropriate use of the emergency services (Lattimer et al. 1998; Thompson et al. 1999). There is potential for the development of new approaches to existing services which acknowledges the changes in society and utilises commonly available technology. In 1994, 91% of households in Great Britain had a telephone (Office of Population Censuses and Surveys, 1996). The use of the telephone in meeting health information needs is receiving an increasing amount of attention at this time with the development of the Government sponsored 'NHS Direct' health information and advice helpline which was introduced subsequent to this research being undertaken (Munro et al. 2000).

The recent proliferation in diagnosis related helplines provides evidence of public acceptance of using the telephone to access information, support and self help (Maisiak et al. 1989; Hirst, 1989; Sadler, 1993; Crone et al. 1993). However, not all helplines are successful in achieving their aims (Glasgow et al. 1993) or reach the most needy in the target group (Maisiak et al. 1989) and their use should be evaluated. Glasgow et al. (1993) reported that participation rates of only 1% to 2% of a target population was a realistic expectation. They further suggested that some telephone helplines might be more successful if they adopted a proactive approach rather than reactively inviting the target population to use the helpline.

The use of the telephone within medical practice is not new. In a letter to the *Lancet* in 1879, a doctor was reported to have used the telephone to discount the diagnosis of croup! (Anonymous, 1879). Until recently, documented evidence of the use of the telephone in medical practice in Great Britain was very limited. However, in primary care general practitioners are increasingly establishing 'phone-in' sessions for patients (Furman, 1983; Hallam, 1991; Nagle et al. 1992). In North America, telephone consultations for the management of paediatric illness are common and occur in a variety of settings (Maples et al. 1972; Glaser et al. 1978; Soman, 1984; Selbst and Korin, 1985; Troutman et al. 1991; Poole et al. 1993).

Almost 80% of mothers with a preterm baby expressed a need for telephone information and support following their baby's discharge from a NNU (McKim, 1993b). Giving health care information over the telephone may be medically and legally hazardous (Isaacman et al. 1992). Appropriate, consistent information and safe practice are therefore supported by the use of protocols (Levy et al. 1979; Strasser et al. 1979). Doctors and nurses need to be trained to give telephone consultations (Bradley Brown and Eberle, 1974; Greitzer et al. 1976; Fosarelli, 1985). The role of providing health care triage can be performed equally well, or better, by nurses than doctors (Russo et al. 1975; Marklund and Bengtsson, 1989; Wilkins, 1993).

The role for nurses giving health information, advice and support via the telephone has, with some exceptions, been slow to gather momentum in the UK (Faulkner, 1990; Sadler, 1993; Lattimer et al. 1998). However, informally nurses frequently give advice to patients over the telephone raising major issues of professional and legal concern as these calls and the advice given are rarely documented. The extent of this informal 'service' and the range of baby health care problems and worries which initiate carers to telephone for advice are unknown. In order to increase knowledge and gain a perspective about this particular source of information the following objective emerges –

**objective (xix) – to identify the extent to which mothers and others access baby care information and advice via the telephone.**

### **Family, friends and others**

New mothers usually have plenty of willing volunteers for baby-sitting. However, a study of mothers who had low birth weight babies found they experienced a reluctance on behalf of friends and relatives to offer this type of support, especially when feeding was difficult or there were anxieties about breathing (Rajan and Oakley, 1990). This lack of social support

combined with the chronic tiredness of early motherhood due to constant baby demands, frequent feeding and disturbed nights may result in social isolation and disrupt personal relationships. Rajan and Oakley (1990) found that 14% of women in their study experienced relationship problems with their partner. However, Berkowitz and Kasl (1983) found no difference in partner support between the mothers of preterm and term infants.

McHaffie (1989) interviewed mothers of VLBW babies on six occasions from one week following birth until three months after the baby's discharge from hospital. In general, partners were found to be very supportive and their support was considered to be very important although four out of the 21 mothers reported added tension in already strained relationships. The mother's own mother was supportive at the key times of admission and discharge from the NNU but was found to lack appropriate knowledge and experience to be fully supportive at other times. Other relatives found it difficult to be supportive because of their lack of understanding and experience.

A survey of 983 new mothers showed they accessed multiple sources of information, with the majority referring to their family doctor for health information (Headway, 1993). Informal family advisors were consulted more frequently than both health visitors and community midwives. However, these informal advisors do not usually have specific information or knowledge about babies born early, small or sick and their information, although well meaning, may be inappropriate for a mother of a baby recently discharged from a NNU. Additionally, the potential for inconsistencies with advice and information are increased when multiple sources are accessed.

The National Pharmaceutical Association's 'Ask the Pharmacist' campaign currently specifically targets young adults (under 24 years) and mothers of young children with leaflets issued weekly and available free of charge from local pharmacies. Even if all pharmacists ensured appropriate distribution of these leaflets, the information relating to babies always refers to term babies and may not be applicable to the ex-NNU population of this study.

Rajan and Oakley (1990) found that mothers of LBW babies disliked comparisons with other 'normal' babies. Although they also disliked unsolicited advice, they wanted better information and 20% wanted more support or help from health professionals.

Goldberg (1978) suggests that parents of preterm babies are more likely to develop realistic expectations of their infants and themselves if they have access to appropriate information about the growth, development and behaviour of preterm babies. This need for accurate information about prognosis and the behavioural and physical characteristics of preterm and term babies discharged from a NNU was still found to be an expressed parental need in 1990 by Kenner and Wright Lott. As stated earlier, preterm babies have increased susceptibility to minor illnesses, it therefore seems appropriate to prepare mothers for this eventuality.

Kenner and Wright Lott (1990) also found that receiving appropriate information enabled mothers to feel in control of baby care at home and was considered to be an essential component of social support. Inconsistent information fostered mistrust between parents and health professionals. Perceived lack of social support or information by mothers generated feelings of inadequacy and undermined confidence in their mothering skills. Hawkins-Walsh (1980) stresses the importance of diminishing anxiety by assessing individual information needs and early intervention rather than standard packages of information at set times. However, it is equally important that the assessment of need is made from the mother's perspective and within her value and belief systems and not based on those of the health professionals.

If lack of social support is a risk factor for premature birth these mothers are also at risk of poor social support following the birth of their baby. Although the primary health care teams are seen as the major contributors in the provision of health and baby care information to parents in the community, many parents also seek information and advice from other professional and non-professional sources. In first-time and experienced mothers, as the number of baby related concerns increased so did the number of referrals for help to others outside the health care team (Pridham et al. 1982). Although this may indicate that mothers found the health professionals were unable to meet all their information and support needs it also indicates that mothers are able to combine formal and informal sources of health information and support. This suggests that mothers are likely to find access to 'Baby Check' and 'Baby Helpline', in parallel to the primary health care team, acceptable as sources of health information. However, are the professional and informal sources of support accessed by mothers who had their baby discharged home from a NNU different from those accessed by other mothers? This question will be addressed through –

**objective (xx) – to identify the professional and informal sources of information, advice and support accessed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

This section has reviewed the literature related to the experiences, worries, anxieties and concerns of new mothers at home with their baby. Mothers' perceptions of their baby's vulnerability to illness and the identified risk factors for susceptibility to cot death highlighted the need for extra support for NNU mothers. Professional and informal sources of health information and support were identified in relation to the different experiences and needs of mothers who have their baby discharged from a NNU and mothers who have standard postnatal care. The following section reviews the literature related to the support intervention used in this study.

## **SECTION FIVE: THE SUPPORT INTERVENTIONS**

### **INFLUENCES ON THE SELECTION OF THE SUPPORT INTERVENTIONS**

#### **Access and availability**

The requirement for the support interventions selected for this study to be accessible to the majority of mothers' who had their baby discharged home from a NNU was fundamental. The NNU where this study was undertaken serves a predominately English speaking population. Although translation services would not be available during the research, if one or both interventions were found to be effective in reducing anxiety and improving mood in mothers following their baby's discharge home from a NNU, it was important that the interventions selected were amenable to translation into languages other than English. In addition, the interventions would also need to be adaptable enough to meet the needs of visually and hearing impaired mothers.

As stated in the Chapter One, most post discharge support interventions initiated by NNUs are targeted towards the mothers of previously very small or very premature babies or babies requiring continued medical or nursing care. However, the purpose of this research was to evaluate interventions that would be applicable to universal use by all mothers who had their baby discharged from a NNU. This criterion was important in recognition of the commonality of the experiences of mothers who had their baby admitted and subsequently discharged from a NNU as described in the earlier sections of this chapter.

In 1994, 91% of households in Great Britain had domestic access to a telephone (Office of Population Censuses and Surveys, 1996). In terms of considering a telephone helpline as a support intervention such widespread availability of telephones was an important factor. Consideration of a telephone based support intervention was supported by McKim (1993b) who found that almost 80% of mothers with a preterm baby expressed a need for access to telephone information following their baby's discharge from a NNU. Additional support for a telephone based intervention came from the evidence presented earlier of the developing use of telephones in the provision of health care.

### **Supportive of mothers' role identity**

As previously described in this chapter, mothers who had their baby admitted to a NNU may have had their role identity and sense of control undermined. It was therefore essential that the interventions selected were supportive of the mother's role and responsibilities for decision making and problem-solving regarding her baby's care and health needs. As described in the introduction to this thesis, Weiss (1976) suggested that support interventions should be ego supportive, based on reality with an emphasis on communication skills. Therefore it was necessary that the support interventions selected were able to inform mothers, and enable and facilitate their decision making and problem-solving. If these criteria were met, the potential existed that the mothers' confidence and self-esteem would be enhanced and her role identity confirmed and supported.

### **Meeting the support needs of mothers**

In previous sections of this chapter we have seen described the worries, concerns and information needs of new mothers and mothers who had their baby discharged home from a NNU. In order to be supportive of this population of new mothers it was essential that the interventions chosen were able to address the main areas of concern that appeared to focus on the recognition of illness, normal and abnormal baby behaviour, feeding, elimination and infection, especially upper respiratory tract infections.

Underlying the identified worries and concerns of mothers may be issues related to their perceived vulnerability of previously small, premature or sick babies to future episodes of ill health as described by Green and Solnit (1964) and Levy (1980) or the increased risk of sudden infant death (Department of Health, 1996). Therefore the interventions selected need to fulfil the requirement to offer confirmation of appropriate recognition of the signs of ill health and also appropriate confirmation of maintained health.

Kenner and Wright Lott (1990) who found that receiving appropriate information enabled mothers to feel in control of their baby, supported recognition of the need of mothers to have access to accurate information.

### **The interventions selected**

Consideration of the influences described above and the evidence presented earlier in this thesis underpinned the decision to select 'Baby Helpline', which offered 24 hour telephone support and information specifically for parents who had taken home their baby from a NNU, and 'Baby Check', a self-assessment scoring system devised to help parents assess the severity of acute illness in babies under six months of age, as appropriate interventions to be evaluated in this study. These interventions will now be described in more detail.

## **BABY CHECK**

### **Development of 'Baby Check'**

In 1986 the 'Baby Illness Research Project', a collaborative study between researchers in Australia and England, was set up with two main aims. The first aim was to determine which signs and symptoms were associated with variations in the severity of illness in babies under six months of age. The second aim was to identify which signs and symptoms or combinations were most useful to parents, health visitors and general practitioners in assessing the severity of illness (Cole et al. 1991; Morley et al. 1991a).

The results of this study identified nineteen markers of illness, twelve signs and seven symptoms present during the previous twenty-four hours as significant for the assessment of severity of illness in babies (Hewson et al. 1990; Thornton et al. 1990). Each sign and symptom was allocated a score based on its regression coefficient, which represented an increased chance of the baby being ill when that sign or symptom was present, which could be added together to give an overall score for an individual baby. The regression coefficients were converted to whole numbers to produce a manageable scoring system with higher scores identifying sicker babies.

The scoring range was banded into broad categories to indicate the severity of illness corresponding to the outcome measure scale. For example, an illness score of 0 - 7 = well or mildly ill, an illness score of 8 - 12 = moderately ill and a score of 13 or more = seriously ill. The score provides a continuous measure of illness and although a score of sixteen indicates serious illness it would be much less serious than a score of thirty. The results of

this 'Baby Illness Research Project' were developed into a score card called 'Baby Check' to help parents assess the severity of acute illness in babies in the first six months of life. A 'Baby Check' booklet is presented as Appendix 1 and is found in the document insert at the back of this thesis.

### **Evaluation of 'Baby Check'**

'Baby Check' has undergone field trials with mothers and health professionals (Cole et al. 1990; Thornton et al. 1991a; Thornton et al. 1991b; Morley et al. 1991b; Kai, 1994). Cole et al. (1990) found that all mothers reported 'Baby Check' was easy or very easy to use, 74% found it useful or very useful with only 5% finding it not at all useful. Over half the mothers said they would use 'Baby Check' during both the night and day if they were worried about their baby and 96% found 'Baby Check' reassuring or not anxiety causing. However, taking a rectal temperature was unpopular and/or difficult for some mothers and interpreting rib and sternal recession was found to be difficult for up to one quarter of mothers (Kai, 1993). There was no evidence that 'Baby Check' increased the number of visits to the general practitioner and may have been responsible for a reduction in visits (Cole et al. 1990). A randomised controlled trial (RCT) of the effect of 'Baby Check' on the use of health services has subsequently shown that distributing 'Baby Check' to an unselected group of mothers had no effect on the use of health services up to six months of age (Thomson et al. 1999).

Studies that evaluated 'Baby Check' with different groups of mothers, have reported findings based on the subjective evaluation of mothers rather than the objective findings of this study (Thornton et al. 1991b; Stewart et al. 1994; Kai, 1994). It has also been previously reported that 'Baby Check' increased the confidence of mothers and provided moral support and reassurance, however these were also subjective evaluations and no other mood dimension has been reported (Thornton et al. 1991b; Kai, 1994). Although the personal evaluations by mothers who used 'Baby Check' are of great importance and value and are not under estimated, objective evaluations are necessary for planning and financing effective support strategies.

However, 'Baby Check' has not been unreservedly welcomed by all health professionals, notably health visitors, who remain sceptical about its value and point out that to date 'Baby Check' has not been shown to either increase or decrease anxiety in mothers (Wright, 1996). This issue will be addressed by this study.

This study will be the first RCT on the effect of 'Baby Check' on the anxiety and mood states of mothers. In addition, with the exception of a short pilot study in New Zealand that involved the families of twelve babies discharged from a NNU (Stewart et al. 1994), this will be the first major study of 'Baby Check' with mothers who had their baby discharged from a NNU. Therefore this study will contribute new knowledge about 'Baby Check' in relation to mothers of babies discharged from a NNU and its effect on their anxiety and mood states.

## **BABY HELPLINE**

### **Development of 'Baby Helpline'**

'Baby Helpline' was devised and developed specifically for this study. This study was undertaken before the advent of 'NHS Direct'. The availability of 'Baby Helpline' was twenty-four hours a day, seven days a week with a dedicated direct dial telephone line with a single number given to participating mothers and their associated primary health care professionals. A 'call forward' system was devised to enable calls to be answered within the hospital during office hours by the project nurses or the researcher and 'out of hours' calls by any one of a team of specially trained nurses 'on call' in their own homes.

A pilot study of 'Baby Helpline' was undertaken during August 1994. The purpose of the pilot study was process focused;

- I. to test the 'call forward' system
- II. to facilitate assessment of the appropriateness and acceptability of the professional information sheets and clinical protocols on which advice and information to parents would be based
- III. to enable assessment of the appropriateness of documentation procedures for recording telephone calls received.

Minor amendments were made to the documentation following the pilot study.

A team of thirteen nurses was recruited specifically for this project and consisted of senior (at least F grade or above) neonatal nurses with either midwifery and/or paediatric nursing backgrounds and a health visitor and school nurse both of whom had neonatal and paediatric experience.

All the nurses attended a specifically designed education and training programme that emphasised the psychological basis supporting the philosophy that underpinned 'Baby

'Helpline'. The course content included discussion of the aims and objectives of the project, verbal and non verbal communication skills in relation to telephone information techniques, the use of clinical protocols and supporting documentation and a range of issues including the scope and limitations of professional practice and ethical considerations. Group clinical supervision facilitated by the researcher took place on a bi-monthly basis during the intervention period and individually following calls received.

All information given by the 'Baby Helpline' nurses was from evidence based protocols. Sample protocols are given in Appendix 2. All telephone calls received were fully documented on a call sheet as shown in Appendix 3.

### **Evaluation of telephone helplines**

This study was the first RCT of the effect of a telephone helpline on its target population. There is an increasing trend for health related telephone helplines to be established without comprehensive evaluation of their effectiveness. Most evaluations of telephone helplines confine themselves to reporting on the frequency and time of use, types of calls received, impact of other services and management or organisational issues (Nagle et al. 1992; Poole et al. 1993; Wilkins, 1993; Lattimer et al. 1998; Thompson et al. 1999; Munro et al. 2000). Helplines, which target specific diagnosis or carer groups, frequently cite 'support' as one of their major aims. However, in contrast to this study, the effect of the support received is rarely objectively evaluated and subjective evaluation is usually only reported in a few general statements (Farquhar, 1989; Hirst, 1989; Angel et al. 1990; O'Donovan, 1993). In addition, these subjective evaluations only report on the effect of the helpline on actual users of the service and no account is taken of the none users (Maisiak et al. 1989; Nagle et al. 1992; Crone et al. 1993). This is a particularly important point as Glasgow et al. (1993) reported a consensus opinion that participation rates of 1% to 2% of the target population as a realistic expectation of helpline use. By definition the users of a telephone helpline are a self-selected group. There are many reasons why some people may passively choose not to use a telephone helpline and why others actively choose not to use a telephone helpline. This study evaluated the effect on anxiety and mood states of access to a telephone helpline in users and non-users rather than measuring 'effectiveness' by the number of calls received. It is possible that having access to a support intervention even if it is not actually used may have an effect on the anxiety and mood of mothers.

Not all telephone helplines are successful in achieving their aims (Glasgow et al. 1993). However, important lessons can be learnt from the experience and Glasgow et al. (1993) suggested that a proactive outreach style of helpline might be more successful than the reactive style of helpline which invited the target population to call as used in this study.

This section has described the development of the support interventions, 'Baby Check' and 'Baby Helpline'. 'Baby Check' and 'Baby Helpline' will be evaluated by measuring their effect on the anxiety and mood states of mothers who had their baby discharged from a NNU.

### **SYNOPSIS OF CHAPTER TWO**

This chapter has reviewed the literature supporting the rationale for evaluating specific support interventions for mothers following their baby's discharge from a NNU from a range of perspectives.

The local and national perspectives on the incidence, morbidity, mortality and maternal characteristics for premature and low birth weight babies who represent around half of the admissions to the NNU where this study is located have been reviewed.

The literature reviewed illustrated that the prospect of admission to a NNU plays no part in the normal expectations of motherhood. The gulf between expectations, myths, and the reality of motherhood leaves healthy women with healthy babies shocked and disillusioned with feelings of failure and inadequacy. For women who have a baby born early or sick and have a vastly altered reality, from even normal expectations, the emotional toll would appear to be profound.

This chapter has also reviewed the factors that may influence the impact of the emotional and physical environment of a NNU on mothers. The literature related to the experiences, worries, anxieties and concerns of new mothers at home with their baby has been reviewed. Mothers' perceptions of their baby's vulnerability to illness and the identified risk factors for susceptibility to cot death highlighted the need for extra support for NNU mothers. Professional and informal sources of health information and support were identified in relation to the different experiences and needs of mothers who have their baby discharged from a NNU and mothers who have standard postnatal care.

The development and rationale for the selection of the support interventions, 'Baby Check' and 'Baby Helpline' were described. 'Baby Check' and 'Baby Helpline' will be evaluated by measuring their effect on the anxiety and mood states of mothers who had their baby discharged from a NNU.

The following chapter will consider the literature that underpinned the methodological considerations in the development of a research strategy to achieve the aims and objectives of this study.

## **CHAPTER THREE**

### **METHODOLOGICAL CONSIDERATIONS**

#### **THE AIM OF THIS CHAPTER**

The aim of this chapter is to describe the methodological considerations undertaken during the process of establishing a strategy for this research. The philosophical issues that underpin and contribute to our understanding of the meanings of research, knowledge and the approaches to research will be considered in relation to this study.

#### **PHILOSOPHICAL CONTEXT OF THIS RESEARCH**

##### **Approaches to research**

Underpinning the process of developing a methodological strategy for this study was consideration of the philosophical context of research. In broad terms, research is the attempt to investigate a question, issue or problem. Although investigation and problem-solving are integral to everyday education and clinical practice, 'research' implies a more systematic, methodical and rigorous approach (Robson, 1993; Usher, 1996).

The natural science research process consists of formulating hypotheses, testing and validating hypotheses through usually, but not exclusively, experimental study design with objective and quantifiable outcomes. If the findings support the hypothesis, they can reasonably be held to be true and if the findings do not support the hypothesis, the hypothesis can be rejected. However, social science is much more abstract and it can be difficult to formulate hypotheses. Data are analysed and interpreted to make sense of the evidence and offer a representation. Connections can be made between cause and effect with a subset of the data collected. Even when the evidence does not support the theory, neither the theory nor the evidence need be totally rejected (Usher and Bryant, 1989). In an interpretative approach to research, the theories and concepts arise from the investigation and data collection rather than initiating the enquiry. The research cycle may involve a number of episodes of data collection and analysis with the results indicating the direction of further data collection. This approach is referred to as 'hypothesis generating' in contrast to the 'hypothesis testing' of natural science research (Robson, 1993).

In the natural sciences, knowledge derived from experiment or observation is regarded as reliable and objective, and carries the highly valued notion of ‘generalisation’. The ability to generalise findings enables predictions to be made and raises the possibility of control and is therefore regarded as the model of research for academic credibility (Chalmers, 1986; Usher and Bryant, 1989). However, generalisability and predictability are not necessarily key features of social research. In terms of this study however, the literature suggests the impact on and responses of mothers who had their baby admitted to a neonatal unit are similar regardless of the geographical location or their baby’s specific diagnosis. It is this commonality of experience that is generalisable and will therefore enable the findings of this research to be applied to other mothers who had their baby discharged from a neonatal unit.

### **New knowledge and understanding**

Within social and educational research the nature of knowledge itself is also of concern. Epistemology is centred on what distinguishes ‘knowledge’ and ‘non-knowledge’, different types of knowledge claims and questions about what counts as fact. Ontology is concerned about what is reality and what exists. Ontological and epistemological issues are therefore naturally related, claims about what exists inevitably lead on to issues about how what exists is known. Epistemological and ontological questions do not answer empirical enquiry but are concerned with the significance and nature of empirical enquiry (Hughes, 1980).

Social research is as concerned with increasing understanding about issues as it is with gaining new knowledge and there is inevitably an interpretative and historical dimension. In relation to this study, an appreciation of the historical perspective of the care of premature babies is essential for health professionals to understand the effect of the power dynamics involved in their relationships with mothers (Budin, 1907; Crosse, 1945; Lundeen and Kunstader, 1957; Crosse, 1966; Silverman, 1979).

Opinions vary about the nature of social science research and whether it can be regarded with the same scientific status as natural science research. The intellectual authority of a knowledge claim is established by the quality of the argument and the processes through which the knowledge was achieved. If a knowledge claim is based on data that were systematically and rigorously collected, appropriate measures and correct procedures of analysis used, followed by logical, objective interpretation then, epistemologically, there are sound reasons for accrediting that knowledge (Hughes, 1980; Usher, 1996). The

findings and the argument are further validated through identified similarities and differences with the accepted literature (Daly, 1993). Therefore, in this study, the methodological strategy and the methods selected to undertake this research will enable fulfilment of those 'accrediting' criteria and the findings will be discussed in relation to the literature in Chapter Twelve of this thesis.

## **ISSUES IN THE DEVELOPMENT OF A RESEARCH STRATEGY**

### **Considerations about quantitative and qualitative approaches**

The methodological strategy describes the distinct approach or framework into which the research is embedded. There is a lack of consensus about how to conceptualise the research process and there is no universally agreed perfect methodological approach (Robson, 1993). A strategy should be flexible enough to enable research to occur but not undisciplined (Daly, 1993). The credibility of the findings of research are inextricably linked to the methodology chosen and should be subject to critical scrutiny, not just in respect of outcomes but also in terms of reflection on the process (Usher, 1995). Therefore, in relation to this research, these issues will be discussed in Chapter Twelve of this thesis.

Qualitative and quantitative methodologies are traditionally viewed as being embedded in opposing paradigms. The distinction between these paradigms exists on three levels; epistemology, theory and process (Brannen, 1992). Although these three elements are linked, the differences between qualitative and quantitative research are most commonly applied at the process level. Traditionally, quantitative strategies have been aligned with quantitative methods of data collection such as questionnaires, experiments and standardised inventories, and qualitative strategies have been aligned with qualitative methods such as unstructured interviews, participant observation and diary keeping (Scott, 1996).

Reichardt and Cook (1979) suggest that the attributes and methods that form the basis of the quantitative and qualitative paradigms are not logically linked together but are independent. They stressed that locating a study in a particular paradigm should not be the sole determinant in the selection of research methods. Although the distinction between qualitative and quantitative methods are frequently cited, this differentiation is of limited use and sometimes allows misleading conclusions to be drawn (Hammersley, 1992). Reichardt and Cook (1979) further suggest that it is only tradition that prevents the combining of the attributes from both paradigms to develop the most appropriate strategy

to meet the aims of a study. Selecting attributes of the same dimension from each paradigm is possible. For example, a study can be exploratory as well as confirmatory or concerned with process as well as outcome orientated. Bryman (1988) suggests that across-method research can also draw on the particular strengths of both quantitative and qualitative research to enhance the quality of the findings and broaden the depth of understanding.

An example of a successful combined qualitative and quantitative approach is a study of social support in pregnancy following the previous birth of a low birth weight baby (Oakley and Rajan, 1991). The study encompassed a quantitative component of a randomised controlled trial of social support and qualitative exploration of the nature of the support and an evaluation of the support received.

### **Considerations about the defined purpose of the research**

In order to select an appropriate methodological strategy and methods for this research it was essential that the aims and objectives of the study were clearly focused and defined as described in the previous chapter of this thesis (Manstead and Semin, 1988).

The purpose of the research impacts on the strategy selected, data collected, method of analysis and the relationship between that data and the context of the research. Therefore the overall purpose of the study is the key element in the process of selecting an appropriate strategy for any research (Manstead and Semin, 1988). However, when considering the purpose of this study the sign posts to the strategy had to be considered in respect of the specific question rather than the overall goal. The ultimate goal of this activity was to contribute to the identification of appropriate and effective methods of supporting mothers who had their baby admitted to a NNU. The goal of supporting mothers appears to fall into the paradigm of qualitative research. However, the specific question related to this study was 'can specific support interventions relieve anxiety and improve mood in mothers following their baby's discharge home from a neonatal unit'. Therefore the principal aim of this study was to evaluate the support interventions and evaluation of health care interventions is more a feature of quantitative research (Bell, 1993; Jadad, 1998).

### **Considerations about the features of quantitative research**

Quantitative research adopts a positivist view that facts exist and can be proven. Theories are tested deductively through hypotheses concerned with causal relationships and effect

(Johnson, 1984). Quantitative research relies heavily on collecting data that are primarily numerical, comparable and from a large enough sample to allow analysis to test for statistical significance and there is also an assumption of a stable reality (Reichardt and Cook, 1979). Quantitative research has been described as outcome orientated and is particularly suitable when there are a predetermined set of variables (Reichardt and Cook, 1979). This allows data to be collected from larger samples and reduces the risk of bias or chance. In some studies the time required to recruit sufficient participants to demonstrate an effect may be long or require participation by multiple centres. Variables can be measured using validated instruments.

The data collected should be free of the values of the researched and the researcher (Daly, 1993). However, caution needs to be exercised when people are the 'objects' being tested, as in this study. An individual's values, experiences and ability to reflect inevitably interact with the process (Susman and Evered, 1978). The causes of social phenomena are frequently multi-factorial and care needs to be taken to ensure all possible influences have been considered before cause and effect conclusions can be drawn. In relation to this study, in order to interpret the data and draw conclusions about the characteristics, experiences, anxiety and mood states of mothers who had their baby discharged from a neonatal unit it was essential to locate the 'neonatal unit mother' into the context of other new mothers. It was necessary therefore to determine the extent to which neonatal unit mothers were different from other new mothers. Consequently, a comparison group of mothers who were discharged home following standard postnatal care were included in the study.

Reliability is critical to quantitative research and refers to the consistency of a test to produce similar results, under constant conditions on all occasions (Sapsford and Evans, 1984; Bell, 1993). Early motherhood and baby care are dynamic situations and do not provide constant conditions. In this study, the change in anxiety and mood over time will be assessed to take some account of the changing condition.

The concept of validity refers to the extent to which an indicator measures or describes what it is intended to measure or describe and encompasses an assessment of the accuracy of the data and the soundness of the argument leading to logical conclusions (Sapsford and Evans, 1984; Bell, 1993). Validity can be broadly divided into internal and external. Internal validity refers to the extent to which the identified 'cause' is actually responsible for the 'effect' or outcome, rather than due to extraneous variables (Cook and

Campbell, 1979). External validity is concerned with the generalisability of the findings to other populations so that the findings are not specific to the sample, previous experiences, setting, construct effects or the outcome measures employed (Le Compte and Goetz, 1982).

Rigorous design, accuracy of data collection, quality of analysis and meticulous administration demonstrate the integrity of quantitative research. The credibility of conclusions drawn can be assessed with reference to the detail presented about research instruments and methods that would allow replication of the study (Johnson, 1984; Robson, 1993). It is important that another researcher could achieve similar results using the same tests on different occasions. Therefore in this study, anxiety and mood states were measured using standardised inventories (Spielberger et al. 1983; Lorr and McNair, 1988). The intervention 'Baby Check' had been validated elsewhere as described in the previous chapter.

Objectivity in quantitative strategies is usually established by maintaining a distance between the researcher from the participants. However, it can be argued that it is impossible to fully understand a phenomenon involving people in a social context, such as early motherhood, from such a remote position. When personal contact between researcher and the participants occurred in this study, objectivity was maintained through the use of standardised dialogue and data collection instruments.

Usher (1996) suggests that acknowledgement of a general scepticism about researcher neutrality in some aspects of social and educational research enables researchers to be more open about the subjective components of their research. Therefore, the position and contribution of the researcher within the research process will be discussed in Chapter Twelve of this thesis. In addition, Robson (1993) recommended that where the researcher was professionally involved with the subjects, as in this study, maintenance of objectivity would be achieved through adopting triangulation of methods.

### **Considerations regarding triangulation of methods**

The technique of utilising mixed methods within a single study is traditionally termed 'triangulation' (Denzin, 1988). In general terms triangulation refers to more than one type of data generated by more than one type of investigation (Bryman, 1988). Triangulation originated in the field of psychology and was developed by Denzin to encompass multiple and different sources of information, methods, investigators and theories (Denzin, 1988).

Brannen (1992) describes four opportunities for using triangulation; firstly, multiple methods, using different methods to obtain related data, called between-methods triangulation or within-methods triangulation, using the same method on different occasions; secondly, multiple data sets, collecting data at different time points, across a range of sources, individuals or groups or in a diversity of contexts; thirdly, multi-disciplinary investigators who bring different perspectives to the research and exerting different influences on the data and fourthly, multiple theories for example, new hypotheses emerging from insights derived from the data or the process. Triangulation of data collection methods improves the quality of the data and subsequently the accuracy of the findings (Bell, 1993; Robson, 1993). Therefore in this study triangulation of methods, between-methods and within-methods, of data collection were used.

### **Ethical considerations**

Political sensitivities and ethical implications can arise from imposing social change or withholding an intervention from some groups in the population. In terms of this study, the interventions to be evaluated 'Baby Helpline' and 'Baby Check', were in addition to the normal primary health care team support given to all new mothers and therefore did not pose such an ethical dilemma. However, ethical approval of the design of the study and all documentation was required.

### **Consideration of the constraints on the research process**

When developing a research strategy and selecting the methods for this study, constraints such as the time available for data collection, access to and compliance of the study populations were acknowledged.

In this study a major constraint on the research strategy and design was the issue of funding. Funding was allocated in two stages as a result of political and regional organisational changes to the research and development bodies who funded the research. Although the Research Management Group always envisaged a three year project, funding was allocated for a one year study followed by a further two years. The implication of this was that the first year study had to be complete within itself as well as an integral part of the main study. Therefore the maximum time available for recruitment of mothers to the main study was only one calendar year regardless of the number of mothers actually recruited. Other pragmatic considerations included the availability of financial, secretarial, computing and statistical support and other human and physical resources, and the

feasibility of different approaches within the context of the research and the time and personnel available (Bell, 1993).

## THE RESEARCH STRATEGY SELECTED FOR THIS STUDY

The overall strategy incorporated a two phased quantitative study comprising of a randomised controlled trial and a comparison study with quantitative methods of data collection. Data were collected using multiple method triangulation from a range of sources using similar and different methods and multiple data sets triangulation by using the same method of data collection at different time points as described by Brannen (1992).

### The randomised controlled trial

The main study utilised the quantitative, experimental design of a randomised controlled trial (RCT) to evaluate the effect of 'Baby Helpline' and 'Baby Check' on the anxiety and mood states of mothers following their baby's discharge from a neonatal unit. A RCT is regarded as the optimum design for the evaluation of health care interventions (Jadad, 1998). This study used a factorial stratified blocked RCT. A RCT has a factorial design when two or more interventions are evaluated separately and in combination against a control. This design therefore produced four groups (A - D) of neonatal unit (NNU) mothers for the trial:-

Group A	received 'Baby Helpline' and 'Baby Check'
Group B	received 'Baby Helpline'
Group C	received 'Baby Check'
Group D	received neither intervention

A low technology approach to randomisation of the interventions was adopted. An index card system was devised, by the Epidemiologist in the Research Management Group, which used four index cards marked individually with the letters A, B, C or D to represent the intervention arms of the trial. Each card was placed into a blank envelope and the four envelopes were shuffled blind and placed into an index card box. The blocking effect was achieved by serially repeating the shuffled four card procedure until two hundred envelopes were in the box. Blocking was used to ensure, as far as possible, that the number of mothers in each arm of the trial would be equal and would therefore minimise confounding due to staff changes, health scares and seasonal variations in health problems.

In order to minimise confounding due to previous mothering experience, the random allocation of mothers to a trial arm group was stratified by mothering experience. The 'experience of mothering' was used for stratification rather than 'parity'. The definition of parity - 'given birth to a live or still born baby after 24 weeks of gestation' did not necessarily equate to experience in providing baby care. Therefore, two index card boxes were prepared, as described above, one marked 'MOTHERING EXPERIENCE - NO' and the other marked 'MOTHERING EXPERIENCE - YES'. Following receipt of a signed consent form, the appropriate 'mothering experience box' was selected and an envelope removed in strict sequential order. The card within indicated to which trial arm group of the study the mother would be allocated.

The outcome measures of the RCT of 'Baby Helpline' and 'Baby Check' were the effect on the anxiety and mood states of the mothers, which were assessed using quantitative standardised inventories for anxiety and mood which are described in Chapter Six of this thesis.

In addition, this study would also identify the characteristics of NNU mothers associated with their anxiety and mood states.

### **The comparison study**

#### **A two phased study**

A supporting quantitatively designed comparison study explored the extent of differences between mothers who had their baby discharged from a NNU and mothers who were discharged home with their baby following standard postnatal care. This aspect of the study was necessary to enable the findings of the RCT, which related to NNU mothers, to be located within the context of other mothers with a new baby. In addition, an exploration of the post discharge baby care experiences, worries and information needs of NNU mothers and other mothers was necessary to inform the development of health care and advice protocols for the 'Baby Helpline' intervention. Quantitative methods of data collection were the pragmatic approach taken to achieve the aims and objectives of this comparison study which study was undertaken in two parts.

#### **Comparison study: part 1**

The first part of the comparison study related to the extent of differences in the post discharge from hospital experiences of mothers who had their baby discharged from a NNU and mothers who were discharged home with their baby from a postnatal ward

(PNW). Data were collected using three different methods, a postal questionnaire, health diary and telephone logs. In this part of the comparison study different groups of mothers were associated with each data collection activity and the telephone logs were established in four different locations. The findings related to the mothers' level of confidence with baby care issues, health events experienced and their worries, concerns and information needs. These findings were also instrumental to the development of the clinical protocols that underpinned the advice given on the 'Baby Helpline' support intervention. Therefore data collected in the first part of the comparison study were used to inform and develop the process of the RCT.

### **Comparison study: part 2**

The second part of the comparison study consisted of mothers who were discharged home with their baby following standard postnatal care who were compared for characteristics, anxiety and mood states with mothers who had their baby discharged from a NNU. Comparisons were made between the mothers' characteristics, anxiety and mood states.

Mothers who had received standard postnatal care were identified from the birth register and were matched for maternal age and mothering experience with the NNU mothers who had been randomly allocated to the no-intervention group (group D) of the RCT. Therefore a subset of NNU mothers simultaneously participated in the RCT and the comparison study. However, the PNW mothers were not part of the RCT.

In the comparison study, all of these mothers received standard post discharge care by the primary health care team without additional support interventions such as 'Baby Helpline' or 'Baby Check'.

### **SYNOPSIS OF CHAPTER THREE**

This chapter has described the philosophical context of research and the theoretical background that underpinned the development of the overall structure and design of this two phased study.

The overall strategy, design and methods of data collection selected for this study were quantitative. The experimental design component of the main study was a randomised controlled trial to evaluate the effect of support interventions on the anxiety and mood states of mothers following their baby's discharge from a NNU. The characteristics

associated with the anxiety and mood states of the neonatal unit mothers were also identified.

The two-part comparison study explored the extent of differences between mothers who had their baby discharged from a neonatal unit and mothers who were discharged home with their baby from the postnatal ward. The first part of the comparison study focused on the post discharge experiences of the mothers. The findings of this part of the study also informed the development of the clinical protocols that underpinned the advice given by the 'Baby Helpline' intervention of the main study. The second part of the comparison study explored the extent of differences in characteristics, anxiety and mood between mothers who had their baby discharged from a neonatal unit and mothers who were discharged with their baby from a postnatal ward.

The quantitative methods of data collection and the methods of triangulation selected are described in following chapters. For ease of presentation, the methods of part one of the comparison study are described in Chapter Four and the findings are described in Chapter Five. The methods and findings of the RCT and the second part of the comparison study, known as the main study, are presented in the Chapters Six to Eleven.

## **CHAPTER FOUR**

### **COMPARISON STUDY (PART 1) METHODS**

#### **THE AIM OF THIS CHAPTER**

The aim of this chapter is to describe the methods used to collect data on the post discharge baby care experiences of mothers who had their baby discharged from a NNU and mothers who were discharged home with their baby from a PNW. Data were collected by postal questionnaire, health diary and telephone logs from different groups of mothers.

#### **The purpose of the comparison study (part 1)**

The purpose of the comparison study was to explore the extent of differences between mothers who had their baby discharged from a NNU and mothers who received standard postnatal care and were discharged home with their baby from a PNW. In addition, the baby care experiences and the worries, concerns, information and support needs identified by these mothers was essential in order to inform and develop the evidence-based protocols that underpinned the advice given on 'Baby Helpline', the telephone support intervention that formed part of the main study. The comparison study was essential in order to establish the context within which to locate the findings related to the NNU mothers.

#### **Funding**

The Research and Development Directorate of the former Wessex Regional Health Authority provided funding for this part of the comparison study which also facilitated the part time employment of the researcher (0.5 whole time equivalent) from November 1993 to January 1995.

Some avenues of enquiry undertaken during the first year of this study do not form part of this thesis. Questionnaires were sent to community midwives and health visitors and general practitioners were interviewed to canvass the primary health care professionals' perception of the worries, concerns and information needs of mothers who had their baby discharged from a NNU. Additional data on the information needs of health professionals regarding ex-NNU babies were also obtained. The processes involved and outcomes of those investigations fall outside the scope and focus of this thesis and are therefore not presented.

### **Ethical considerations**

The research protocol including the postal questionnaire, health diary and accompanying letters and information sheets to mothers were submitted to the local Health District Ethics Committee and full approval was granted. Written consent was not required for participation in the questionnaire component of this study as completion and the return of the questionnaire were deemed to be agreement to participate in the study. Therefore no follow-up letters or repeat questionnaires were sent to non-responders. However, written consent (shown in Appendix 4) was required for participation in the health diary component of the study as mothers were recruited prior to their baby's discharge home from the NNU.

### **POSTAL QUESTIONNAIRE**

#### **The purpose of the questionnaire**

The purpose of the questionnaire was to collect information on the mothers' level of confidence with baby care scenarios, health events actually experienced and their worries, concerns, information and support needs. Information was also collected on the mothers' present sources of baby health information, and the frequency of and satisfaction with health professional contacts.

#### **Mothers who were sent a questionnaire**

In an attempt to reflect as wide a range of NNU experiences as possible, 30 mothers who had their baby discharged from a NNU during the previous twelve week period were randomly selected within two broad selection criteria. Firstly, the time since discharge home, up to one month, up to two months and up to three months and secondly, their baby's length of stay in a NNU, less than 7 days, between 8 and 14 days, between 15 and 21 days, between 22 and 28 days and more than 29 days.

A control or comparison group of 30 mothers who were discharged home with their baby following standard postnatal care from a PNW were also selected. They were matched with the NNU mothers for the time elapsed since discharge from hospital, postal code at district level (to take some account of similarities in environmental factors and local health care and support amenities), maternal age and previous mothering experience.

The mothers selected were sent a questionnaire with a covering letter (shown in Appendix 5) explaining the purpose of the study. The mothers were asked to complete the questionnaire and return it using the enclosed stamped and addressed envelope provided.

### **Constraints to data collection**

The questionnaire sought mainly retrospective information, which may well have been altered from reality due to the passage of time. However, the mothers' retained perception or recollection of her experiences, worries, information and support needs remain 'real' for that individual mother and impact on her experience of early motherhood. The risk of 'altered' recollection of experiences was the same for all mothers. In addition, the possibility of non-compliance with the request to complete a questionnaire by busy mothers with a young baby was high.

### **Sensitivity check prior to distribution of the questionnaire**

Immediately prior to the questionnaires being posted, telephone checks were made by the researcher to health visitors, general practitioner surgeries and the Central Health Clinic to ascertain if any baby had died as a result of illness, accident or sudden infant death syndrome since they were discharge home. In the event of such a death it would be inappropriate to contact the mother. All the babies were alive and well and living with their mother.

### **Questionnaire design**

#### **Objectives addressed through the questionnaire**

The structured questionnaire elicited information that contributed to the fulfilment of the following objectives -

**objective (ix) – to discover the level of confidence in aspects of baby care expressed by mothers who had their baby discharged from a neonatal unit, and to compare this with mothers discharged home following standard postnatal care.**

**objective (xvi) – to identify the level of satisfaction with present sources of professional health information, advice and support expressed by mothers who had their baby discharged from a neonatal unit, and to compare this with mothers discharged home following standard postnatal care.**

**objective (xvii) – to identify the actual baby health care events experienced by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

**objective (xviii) – to discover the worries and concerns expressed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

**objective (xx) – to identify the professional and informal sources of information, advice and support accessed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

### **Content of the questionnaire**

The questionnaire design was similar for the NNU and PNW mothers and used a mixture of structured and semi-structured questions. The structure of the questionnaire varied slightly with questions which related specifically to a NNU given to the NNU mothers only and the stem of multiple questions was worded appropriately for NNU mothers (shown in Appendix 6) and PNW mothers (shown in Appendix 7). The questionnaire was piloted on a small number of randomly selected new mothers who attended a health visitor clinic.

Thereafter minor amendments were made to some questions.

The questionnaire was presented in five sections and references to the literature that support the enquiry are given in each section:-

#### **Section 1 Questions about the baby**

All the questions in this section were structured, factual questions about the baby designed to be non-challenging and ease the mother into the questionnaire.

#### **Section 2 Questions about being at home immediately after the baby was discharged from the Neonatal Unit / Maternity Hospital**

This sequence of questions required self-assessment of the degree of confidence felt by mothers about coping with possible baby health care events or behaviours. The questions were based on common queries frequently made by mothers and cited in the literature as maternal concerns (Adams, 1963; Pridham et al. 1982). Mothers were asked to circle the number on a Likert Scale from one to four, (1 = not confident, 2 = slightly confident, 3 = moderately confident and 4 = very confident), the response which mostly closely reflected how they felt about each baby care scenario.

**Section 3 Questions about any problems, worries or concerns experienced during the weeks since the baby was discharged from the Neonatal Unit / Maternity Unit**

The focus of this section was directed towards identifying any health problems, signs of illness or unusual behaviour by the baby that mothers had actually encountered since discharge home (Hewson et al. 1990; Thornton et al. 1990).

**Section 4 Questions about contacts for information, advice and/or support**

This sequence of questions aimed to identify whom mothers' perceived to be their sources of information, advice and support. Questions in this section also identified formal contacts with primary care health professionals and the mothers' level of satisfaction with those contacts (Levy, 1980).

**Section 5 Questions about the mother**

This section ascertained information about the mother such as age, occupation, and educational attainment on leaving school and access to a domestic telephone (Office of Population Censuses and Surveys, 1996).

## **HEALTH DIARY**

**The purpose of the health diary**

The purpose of the health diary was to gather information from mothers about their worries and concerns regarding their baby's health or care. In addition, their sources of information, advice and support and their satisfaction with the information, advice and support received were also recorded (Adams, 1963; Pridham et al. 1982; Hewson et al. 1990; Thornton et al. 1990). The health diary was piloted with two mothers for two weeks and amendments were made to specific questions in response to their comments.

**Mothers who agreed to receive a health diary**

The mothers of ten consecutive babies imminently to be discharged from a NNU who agreed to participate in the study and who signed a written consent form were asked to make daily entries into the Health Diary for one month following their baby's discharge home.

Prior to the baby's discharge home the mothers recruited were given the opportunity to withdraw from the study, although none chose to do so. The purpose of the study was

explained again and how to complete the diary was demonstrated. Mothers were requested to start entries in the Health Diary the day following discharge home. At the end of the data collection month a letter was sent thanking each mother for her participation in the study. The mothers were asked to return the completed diary in the stamped and addressed envelope provided.

### **Constraints to data collection**

Diaries can yield qualitative and quantitative data from contemporaneous record. However, a recognised constraint of diary keeping is that the quality and quantity of data collected are subject to the commitment of those who participate in the study. The risks of non-compliance or retrospective completion are high. There is also a risk of an 'observer effect' where behaviour is modified because of the diary keeping. Entries may be made in the diary to create a favourable impression of compliance with the study alternatively omissions regarding worries and concerns may be deliberate to give the impression of a mother who was in control and coping well (Oppenheim, 1966).

### **Health diary design**

#### **Objectives addressed through the health diary**

The health diary collected data that contributed to the fulfilment of the following objectives–

**objective (xvi) – to identify the level of satisfaction with present sources of professional health information and support expressed by mothers who had their baby discharged from a neonatal unit, and to compare this with mothers discharged home following standard postnatal care.**

**objective (xviii) – to discover the worries and concerns expressed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

**objective (xx) – to identify the professional and informal sources of information, advice and support accessed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

### **Content of the health diary**

The rationale for the content and structure of the health diary was based on previous studies that have considered the concerns and information needs of new mothers (Adams, 1963; Pridham et al. 1982; Harrison and Hicks, 1983; Smith, 1989; McKim, 1993a).

Each diary contained an instruction letter and a contact name and telephone number if any problems were encountered. Daily entries into the health diary were requested in order to illustrate any pattern to the worries or information needs experienced by mothers. It was also considered that regular daily entries might aid compliance. It was recommended that the diary be completed at roughly the same time each day. If however, a few days were missed the instruction was to ignore the missed days and the start again on the correct page for the current date.

On each day there was a maximum of eight questions that could be answered on two facing pages of an A5 sized book. A minimum of two questions (questions 1 & 5) were required to be completed each day with the need to respond to the remaining six questions dependent on those initial responses. The instructions and a daily page from the health diary are shown in Appendix 8. The questions within the health diary were:-

#### **Question 1**

In the last 24 hours, how worried have you felt about your baby's health and behaviour?  
(Likert scale response - 1 = not at all worried to 4 = very worried).

#### **Question 2**

Please give brief details of your worries or concerns (free text response).

#### **Question 3**

Please indicate below :-

- a who you contacted for advice and support?
- b how satisfied were you with the advice and support you received?

Listed were a range of formal and informal sources of advice and support. The distribution of the diaries coincided with a month long pilot study of the 'Baby Helpline' intervention. The mothers of all babies discharged from the NNU during that month received information about the pilot of 'Baby Helpline' and the telephone number. Therefore 'Baby Helpline' was listed as a possible source of support and information. A Likert scale was placed along side each possible source of support for mothers to indicate their level of satisfaction with

the advice and support received from that source - 1 = very dissatisfied, 2 = generally dissatisfied, 3 = generally satisfied, 4 = very satisfied).

**Question 4**

How did the advice or support you were given affect the way you looked after your baby today? (free text response).

**Question 5**

In the last 24 hours, have you wanted any extra information about your baby or babies in general? (YES/NO response).

**Question 6**

Please give brief details of your information needs (free text response).

**Question 7**

Please indicate below :-

- a whom you contacted for information?
- b how satisfied were you with the information you received?

Listed below was a range of formal and informal sources of information with a Likert scale along side for mothers to indicate their level of satisfaction with the information received from that source as for question 3.

**Question 8**

How did the information you were given affect the way you looked after your baby today? (free text response).

**TELEPHONE LOGS**

**The purpose of the telephone logs**

The widespread availability of the domestic telephone (Office of Population Censuses and Surveys, 1996) and its increased use for acquiring health information was described in Chapter Two. It was considered that mothers with a baby recently discharged from hospital might seek to acquire health information, advice and support from hospital sources. Therefore telephone logs were established to document calls from the public who proactively sought health information, even though no formal telephone helpline existed

within the hospital, and to provide 'real-time' information about the worries, concerns and information needs of those caring for babies at home.

### **Location of the telephone logs**

Telephone logs were instigated at four locations within the hospital where it was considered information, advice or support regarding baby health and care might reasonably be sought:-

- Infant Feeding Specialist
- Postnatal Ward
- Accident & Emergency Department (A & E)
- Neonatal Unit

No problems of access were experienced with personnel or within these departments. An interest in the study and willingness to participate was expressed by all concerned. The telephone logs were piloted for one week before data collection began in all locations except A & E which already had an established log of telephone calls received. Small amendments were made to the log sheets where necessary.

### **Constraints to data collection**

A major disadvantage to this method of data collection was its time-consuming nature for busy health professionals who may fail to record the information accurately or at all (Bell, 1993). The quality of the data collected was therefore dependent on the commitment to research of those answering the telephone.

### **Telephone log design**

#### **Objectives addressed through telephone call logging**

The telephone log data collection contributed towards the fulfilment of the following objectives –

**objective (xviii) – to discover the worries and concerns expressed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

**objective (xix) – to identify the extent to which mothers and others access baby care information and advice via the telephone.**

### **Infant Feeding Specialist telephone log**

The Infant Feeding Specialist (IFS) agreed to record details of all calls received requesting information, advice or support about feeding issues from mothers and health professionals prospectively for six months. A log of calls received was not previously recorded. Her availability was Monday to Friday during office hours and there was no cover in the event of her absence. A pre-formatted log sheet was collaboratively designed and the IFS asked to record details of the date and time of calls received, the problem as described by the caller, advice given, the relationship of the caller to the mother and baby, age of baby and the duration of the call. Regular contact with the IFS was maintained during the period of call logging.

### **Postnatal Ward telephone log**

All mothers with babies discharged from the postnatal ward (PNW) were routinely verbally invited to telephone a specific ward if they had any concerns regarding their own obstetric health or their baby's health. There was, in theory, twenty-four hour availability of this number. However, there was no dedicated telephone line allocated for these calls and all internal and external calls to the ward competed for the same two telephone lines. No specific guidance was given to mothers regarding when to telephone the PNW or when to call their community midwife or indeed an upper age limit for the baby concerned. Staffing levels and skill mix on the PNW were calculated on bed occupancy and no additional staff were allocated to cope with the additional workload of telephone enquiries. At ward level, no specific member of staff was allocated to answer telephone enquires and ward-based clerical staff were only available during morning hours to answer any administrative queries. Prior to the instigation of this telephone log no record was kept of calls received or the advice given.

Representatives of the PNW staff were involved with the development and introduction of the telephone log. All ward staff were informed of its purpose not only in terms of this research project but also its potential as a measure of their additional workload. A pre-formatted log sheet was designed and used to record the date and time of the call, the problem as described by the caller, advice given, identity of the caller, age of baby, the name of the person receiving the call and the duration of the call. The log was instigated for three months. Frequent contact was maintained with the PNW staff during the period of call logging.

### **Accident and Emergency Department telephone log**

The A & E Department already recorded full details of all telephone calls received from the public seeking medical or nursing advice. A senior nurse or doctor answered all telephone calls. There was twenty-four hour availability of this information and advice facility although it was not a formally advertised or promoted service. The date and time of each call was recorded along with the problem as described by the caller. The name and relationship of the caller to the person requiring medical or nursing assistance was recorded if the caller was willing to give this information. The advice given, the time the call ended and the name of the person giving the advice was entered. In all calls relating to children, the child's age was also recorded. Telephone calls pertaining to children were not referred to a qualified childrens' nurse even if one was on duty. However, at the time of this research there were only two qualified childrens' nurses employed in the A & E Department. Details of all calls received relating to babies under one year of age were abstracted by the researcher from these records on a weekly basis and entered on to a pre-formatted log sheet.

### **Neonatal Unit telephone log**

The Neonatal Unit (NNU) receives calls from the general public, parents and health professionals requiring health advice or information about baby care and management. Informally it was acknowledged that the majority of calls received concerned babies previously discharged from the NNU. There was, in theory, twenty-four hour availability of this source of information. However, there was no dedicated telephone line and calls competed with all other internal and external calls. Although this was not a formally advertised or funded service, parents were frequently verbally invited to telephone the NNU if they had any problems or concerns about their baby following discharge home. Any available nurse or doctor, regardless of their experience took the telephone calls and referrals to more experienced staff were at the discretion of the person receiving the initial call. No details of the calls received or the advice given were previously recorded.

Representatives of the NNU staff were involved with the development and introduction of the telephone log. All NNU staff were informed of its purpose and instructed in its use. They were asked to complete a pre-formatted log sheet for each call received about non-resident babies regardless of the origin of the call. The information recorded included date and time of call, the problem as described by the caller, action already taken, relationship of the caller to the baby, name and age of baby, confirmation of previous admission to the NNU, advice given including details of referrals to other health professionals, the person

giving the advice and the duration of the call. Frequent contact was maintained with the NNU during call logging.

### **STATISTICAL METHODS USED IN THE COMPARISON STUDY (PART 1)**

The analysis was carried out using Epi Info (version 5) and the Statistical Package for Social Sciences (SPSS for Windows version 8). Where data were normally distributed the mean and standard deviation were stated and for skewed data the median and interquartile range (IQR) were given.

The significance of differences between groups of mothers was derived by Pearson's Chi-square test if all cells had an expected cell count of five or greater. When the expected cell count was less than five in 2x2 tables the Fisher's Exact test was used. To test for the equality of mean scores between groups the Student's *t*-test was used. Where data were skewed the differences between median scores were derived from a non-parametric test, Mann-Whitney. Statistical significance was attributed to *p*-values of 0.05 or less.

Mark Mullee of the University Department of Medical Statistics and Computing is acknowledged for the production of the findings that related to matched pairs of NNU and PNW mothers.

### **SYNOPSIS OF CHAPTER FOUR**

This chapter has described the data collection methods selected to achieve the objectives of the comparison study (part 1) and the statistical methods used in the analysis. Data collection involved different populations of mothers in order to develop a broad as possible perspective of the issues under investigation and access a range of contextual situations. The data collection tools were a postal questionnaire, health diary and telephone logs. The findings of this study are presented in the following chapter.

## **CHAPTER FIVE**

### **COMPARISON STUDY (PART 1) FINDINGS**

#### **THE AIM OF THIS CHAPTER**

The aim of this chapter is to presents the findings of the -

- **Questionnaire**
- **Health Diary**
- **Telephone Logs**

#### **QUESTIONNAIRE**

##### **Mothers who completed the questionnaire**

The findings from the postal questionnaire related to mothers who had their baby discharged home from a neonatal unit (NNU) and the mothers with whom they were matched who were discharged home with their baby from a postnatal ward (PNW) following standard postnatal care.

Twenty-four (80%) NNU mothers and twenty-four (80%) PNW mothers completed and returned the questionnaires. That response provided 19 (79%) pairs of mothers who were matched for the time elapsed since discharge from hospital, postal code at district level (to take some account of similarities in environmental factors and local health care and support amenities), maternal age and previous mothering experience. There were no significant differences between the 24 NNU mothers and the 24 PNW mothers for any of the matched variables, or educational attainment on leaving full time education ( $p=0.66$ ) or telephone ownership ( $p=0.61$ ). The characteristics of the babies are shown in table 2.

**Table 2      Characteristics of babies (n=48)**

Characteristics	NNU mothers n=24 mean (sd)	PNW mothers n=24 mean (sd)	Difference between groups <i>p</i> -value
<b>Gestation at birth (weeks)</b>	35.42 (3.26)	39.96 (1.71)	<0.001
<b>Duration of hospital stay (days)</b>	21 (7 – 28) <sup>a</sup>	4 (2 – 6) <sup>a</sup>	<0.001 <sup>b</sup>
<b>Time since discharge (weeks)</b>	9.33 (3.36)	9.37 (3.23)	0.97
<b>Present age of baby (weeks)</b>	12.21 (4.13)	9.96 (3.29)	0.04

<sup>a</sup> = median (IQR)

<sup>b</sup> =Mann-Whitney test

In table 2, *t*-tests for the equality of means and a Mann-Whitney test show that there were significant differences between the babies of the NNU and PNW mothers. The NNU mothers gave birth at a significantly younger gestation than the PNW mothers ( $p<0.001$ ). The duration of stay in hospital was significantly longer for the NNU babies, median of 21 days compared with the PNW mothers and babies who were discharged home at a median of 4 days post delivery ( $p<0.001$ ). However, there was no significant difference between the NNU mothers and the PNW mothers for the length of time they had their baby at home as this was a matched variable ( $p=0.97$ ). At the time the mothers completed the questionnaire, the babies of NNU mothers were significantly chronologically older than the PNW babies as a result of prematurity and their longer stay in hospital prior to discharge home ( $p=0.04$ ).

### **Maternal confidence**

The mothers made a self-assessment of how confident they felt about a range of baby care scenarios immediately following their baby being discharged home. They indicated on a Likert scale the level of confidence which most closely represented how they felt. The objective addressed by these findings was -

**objective (ix) – to discover the level of confidence in aspects of baby care expressed by mothers who had their baby discharged from a neonatal unit, and to compare this with mothers discharged home following standard postnatal care.**

The mothers' self-assessed levels of confidence are shown in table 3.

**Table 3      How confident do you feel about:-**

3.1    **your baby remaining well?**

	<b>NNU mothers n=24 (%)</b>	<b>PNW mothers n=24 (%)</b>
<b>Not confident</b>	1 (04.2)	0
<b>Slightly confident</b>	3 (12.5)	1 (04.2)
<b>Moderately confident</b>	15 (62.5)	17 (70.8)
<b>Very confident</b>	5 (20.8)	6 (25.0)

3.2 **you recognising when your baby was not well?**

	NNU mothers n=24 (%)	PNW mothers n=24 (%)
<b>Not confident</b>	0	0
<b>Slightly confident</b>	5 (20.8)	5 (20.8)
<b>Moderately confident</b>	16 (66.7)	11 (45.8)
<b>Very confident</b>	3 (12.5)	8 (33.3)

3.3 **being able to care for your baby on your own?**

	NNU mothers n=24 (%)	PNW mothers n=24 (%)
<b>Not confident</b>	0	0
<b>Slightly confident</b>	2 (08.3)	1 (04.2)
<b>Moderately confident</b>	10 (41.7)	9 (37.5)
<b>Very confident</b>	12 (50.0)	14 (58.3)

3.4 **giving medicines to your baby?**

	NNU mothers n=22 (%)	PNW mothers n=24 (%)
<b>Not confident</b>	0	1 (04.2)
<b>Slightly confident</b>	1 (04.5)	2 (08.3)
<b>Moderately confident</b>	6 (27.3)	9 (37.5)
<b>Very confident</b>	15 (68.2)	12 (50.0)

3.5 **what to do if your baby would not feed?**

	NNU mothers n=24 (%)	PNW mothers n=24 (%)
<b>Not confident</b>	1 (04.5)	1 (04.5)
<b>Slightly confident</b>	5 (20.8)	6 (25.0)
<b>Moderately confident</b>	15 (62.5)	12 (50.0)
<b>Very confident</b>	3 (12.5)	5 (20.8)

3.6 **what to do if your baby would not stop crying?**

	NNU mothers n=24 (%)	PNW mothers n=24 (%)
<b>Not confident</b>	3 (12.5)	3 (12.5)
<b>Slightly confident</b>	6 (25.0)	7 (29.2)
<b>Moderately confident</b>	12 (50.0)	8 (33.3)
<b>Very confident</b>	3 (12.5)	6 (25.0)

3.7 what to do if your baby vomited back medicines?

	NNU mothers n=22 (%)	PNW mothers n=24 (%)
<b>Not confident</b>	4 (18.2)	5 (20.8)
<b>Slightly confident</b>	6 (27.3)	9 (37.5)
<b>Moderately confident</b>	8 (36.4)	9 (37.5)
<b>Very confident</b>	4 (18.3)	1 (04.2)

3.8 what to do if your baby vomited an entire feed?

	NNU mothers n=24 (%)	PNW mothers n=24 (%)
<b>Not confident</b>	2 (08.3)	1 (04.2)
<b>Slightly confident</b>	6 (25.0)	8 (33.3)
<b>Moderately confident</b>	14 (58.3)	14 (58.3)
<b>Very confident</b>	2 (08.3)	1 (04.2)

3.9 your baby's ability to continue breathing day and night?

	NNU mothers n=24 (%)	PNW mothers n=24 (%)
<b>Not confident</b>	3 (12.5)	5 (20.8)
<b>Slightly confident</b>	8 (33.3)	3 (12.5)
<b>Moderately confident</b>	9 (37.5)	12 (50.0)
<b>Very confident</b>	4 (16.7)	4 (16.7)

3.10 what to do if your baby stopped breathing?

	NNU mothers n=24 (%)	PNW mothers n=24 (%)
<b>Not confident</b>	4 (16.7)	11 (45.8)
<b>Slightly confident</b>	4 (16.7)	6 (25.0)
<b>Moderately confident</b>	10 (41.7)	4 (16.7)
<b>Very confident</b>	6 (25.0)	3 (12.5)

(When comparing 'not confident' + 'slightly confident' with 'moderately confident' + 'very confident' across two groups in this table  $p=0.009$ )

Table 3 shows self-assessed levels of confidence felt by mothers about a range of baby care scenarios. In table 3.1, only one PNW mother assessed herself as feeling less than 'moderately confident' about her baby remaining well compared with four NNU mothers. Only five NNU mothers and six PNW mothers felt 'very confident' that their baby would remain well.

All mothers felt at least 'slightly confident' of recognising when their baby was not well (table 3.2). Eight PNW mothers compared with only three NNU mothers felt 'very confident' of recognising when their baby was unwell.

Most NNU and PNW mothers described themselves as feeling 'very confident' about being able to care for baby on their own (table 3.3). However, 50% (n=12) of the NNU mothers and 42% (n=10) of the PNW mothers assessed themselves as feeling only 'slightly' or 'moderately confident' to care for their baby on their own.

In table 3.4, the majority of NNU mothers (96%) and PNW mothers (88%) assessed themselves as 'moderately' or 'very confident' at giving medicines to their baby. Fifty-five percent of NNU mothers felt 'moderately' or 'very confident' about what to do if baby vomited back medicines (table 3.7) but 58% of PNW mothers felt 'not confident' or only 'slightly confident' about this aspect of baby care.

Table 3.5 shows the majority of mothers in both groups felt 'moderately' or 'very confident' about what to do if their baby would not feed. In both groups, 58% of mothers felt 'moderately confident' about what to do if their baby vomited an entire feed (table 3.8) although one third or more in both groups assessed themselves as only 'slightly' or 'not confident' to deal with this common situation.

In table 3.6, twice as many PNW mothers (n=6) than NNU mothers (n=3) felt 'very confident' about what to do if their baby would not stop crying. Half of the NNU mothers (n=12) felt 'moderately confident' with this aspect of baby care compared with one-third (n=8) of the PNW mothers. Three mothers in each group described themselves as 'not confident' to deal with this very common event.

In table 3.9, only four (17%) mothers in both groups felt 'very confident' in their baby's ability to continue breathing day and night. Forty-six percent (n=11) of the NNU mothers and 33% (n=8) of the PNW mothers felt only 'slightly' or 'not confident' in their baby's ability to continue breathing day and night.

Almost half (n=11) of the PNW mothers assessed themselves as 'not confident' about what to do if baby stopped breathing compared with four NNU mothers. Two-thirds (n=16) of the NNU mothers felt 'moderately' or 'very confident' about what to do in this emergency situation compared with only seven PNW mothers (table 3.10).

In table 3, although there appeared to be differences between the mothers, when the mothers who assessed themselves to be 'not confident' or 'slightly confident' were combined and 'moderately confident' or 'very confident' were combined, Chi-squared and Fisher's Exact tests showed that there was only one significant difference between the NNU and PNW mothers. The NNU mothers were significantly more confident about 'what to do if your baby stopped breathing' (table 3.10) than the PNW mothers ( $p=0.009$ ).

### Overall confidence scores

From the ten sub-tables of table 3, an overall confidence score was calculated for individual mothers and an overall confidence score derived for the NNU and PNW groups of mothers.

The overall confidence score was achieved by calculating the mean score for each individual mother based on the numerical value attributed to their response on the Likert scale. This score was then allocated to a quartile rating of 'not confident', 'slightly confident', 'moderately confident' or 'very confident' as shown in table 4.

**Table 4      Overall confidence scores for individual mothers (n=48)**

	Mean score range	NNU mothers n=24	PNW mothers n=24
<b>Not confident = 1</b>	1 – 1.75	0	2
<b>Slightly confident = 2</b>	1.76 – 2.50	6	5
<b>Moderately confident = 3</b>	2.51 – 3.25	11	11
<b>Very confident = 4</b>	3.26 – 4.00	7	6

Table 4 shows the number of mothers whose average confidence score achieved each of the quartiles for confidence. Two PNW mothers averaged 'not confident' and five PNW mothers averaged 'slightly confident' compared with six NNU mothers who averaged 'slightly confident'. Eleven mothers in both groups had a 'moderately confident' average score and seven NNU mothers and six PNW mothers averaged 'very confident' in their overall confidence score with the baby care scenarios itemised.

A confidence score for each group of mothers was derived by calculating the median of the total individual scores within each group of mothers and is shown in table 5.

**Table 5 Overall confidence score for the groups of mothers (n=48)**

Group of mothers	Median (IQR) score for group	Overall confidence level
<b>NNU mothers (n=24)</b>	3.05 (2.43 – 3.30)	moderately confident
<b>PNW mothers (n=24)</b>	2.95 (2.43 – 3.35)	moderately confident
<b>Difference between groups</b>	<b>p=0.75</b>	

Table 5 shows the confidence score for the groups of NNU mothers and PNW mothers and are presented as median scores and interquartile range (IQR) because of skewed distribution. A Mann-Whitney test detected no significant difference between the confidence scores of the NNU mothers and the PNW mothers ( $p=0.75$ ). Both groups of mothers assessed themselves as 'moderately confident' to deal with the baby care scenarios presented.

### Level of confidence comparing matched pairs of mothers

Figure 2 shows the level of confidence of the NNU mothers compared to their matched or paired PNW mothers ( $n=19$  matched pairs). The numeric value attributed to the response on the Likert scale given by the NNU mothers was subtracted from that of the PNW mothers. The categories of less, equivalent or more confident are therefore relative so that if a NNU mother responded 'moderately confident' (3) and the PNW mother responded 'very confident' (4) the NNU mother would be classified as 'less confident' than the PNW mother even though both expressed a positive level of confidence.

**Figure 2 Level of confidence of neonatal unit mothers compared with paired postnatal ward mothers**

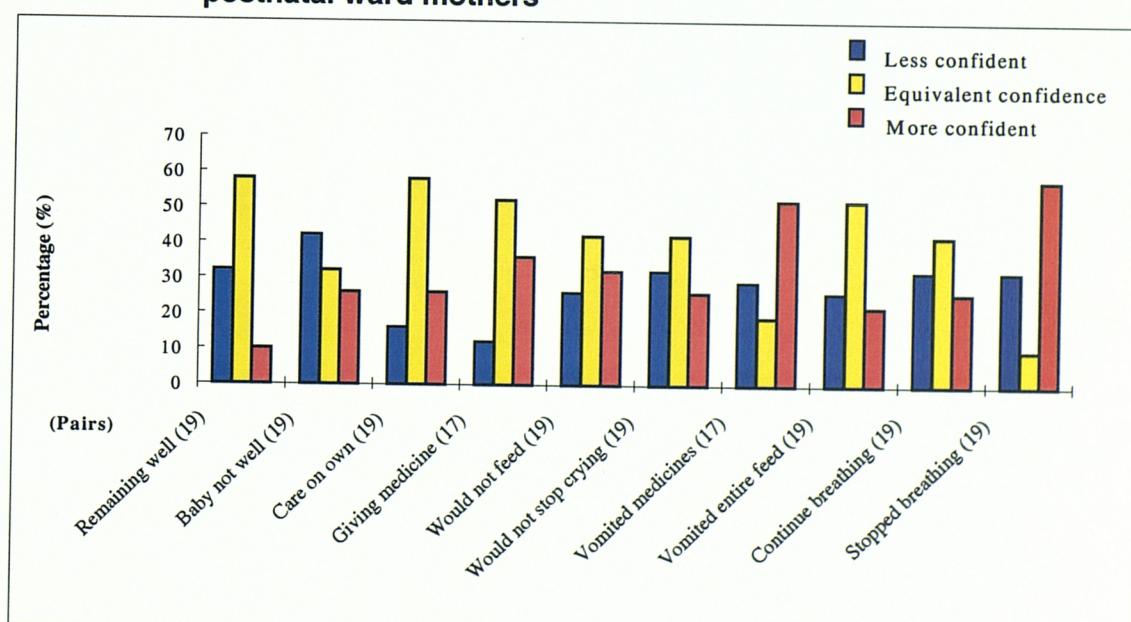


Figure 2 shows that although over 50% of the NNU mothers expressed equivalent confidence to the PNW mothers that their baby would remain well, 32% of NNU mothers were less confident. Even though mothers who had their baby in a NNU were likely to have seen their baby in an unwell state, 42% felt less confident than their paired PNW mothers that they would recognise when the baby was not well.

The majority of NNU mothers were equally or more confident than PNW mothers in their ability to care for their baby on their own. However 16% of NNU mothers assessed themselves as less confident.

Fifty-two per cent of NNU mothers expressed equivalent confidence to their paired PNW mothers in giving medicines to their baby but were more confident about what to do if their baby vomited back medicines. One quarter of NNU mothers were less confident than the PNW mothers about what to do if their baby would not feed or vomited back the entire feed.

The majority of NNU mothers were equally or more confident than the PNW mothers about what to do if their baby would not stop crying, but as many as 32% of the NNU mothers expressed less confidence than their paired PNW mother in this common parenting activity.

As many as 32% of NNU mothers expressed less confidence than their paired PNW mother that their baby would continue to breathe day and night and what to do if the baby stopped breathing. However, 58% of NNU mothers expressed more confidence in what to do if the baby stopped breathing than their paired PNW mother.

### **Summary of maternal confidence**

The NNU mothers were generally no more or less confident in their ability to cope with the baby care scenarios presented than the PNW mothers ( $p=0.75$ ). The overall confidence score showed that the NNU mothers and the PNW mothers assessed themselves to be 'moderately confident'. However, the NNU mothers were more confident than the PNW mothers about 'what to do if your baby stopped breathing' ( $p=0.009$ ).

Compared with their paired PNW mother, the majority of the NNU mothers felt:-

- **less confident about -** recognising when their baby was not well.
- **equivalent confidence about -** baby remaining well  
able to care for baby on own  
giving medicines to baby  
what to do if the baby would not feed  
what to do if baby would not stop crying  
what to do if baby vomited an entire feed  
baby's ability to continue to breathe day and night
- **more confident about -** what to do if baby vomited back medicine  
what to do if baby stopped breathing.

### Worries and information needs of mothers

The findings from this section of the questionnaire contributed toward fulfilment of -

**objective (xviii) – to discover the worries and concerns expressed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

Table 6 shows the number of mothers who reported that they had been worried or concerned about their baby's health and those who reported they had queries or information needs about baby care routines since discharge home.

**Table 6      Reported health worries and information needs (n=48)**

	Neonatal unit mothers		Postnatal ward mothers		Difference between groups <i>p</i> -value
	YES (%)		YES (%)		
Health worries	n=24	13 (54)	n=24	16 (67)	0.38
Information needs	n=24	7 (29)	n=23	7 (30)	0.92

Table 6 shows that there were no significant differences between the number of NNU mothers and PNW mothers who reported that they had health worries ( $p=0.38$ ) and baby care information needs ( $p=0.92$ ) since discharge home.

The reported worries are shown in table 7.

Table 7 Health worries reported by mothers

Worries	Neonatal unit mothers n=13	Postnatal ward mothers n=16
Apnoeic episode	1	
Blocked nose		1
Breathing difficulties	3	2
Bronchiolitis	2	2
Choking	1	
Cold	3	4
Colic		2
Constipation		2
Cough	1	2
Diarrhoea	2	
Feeding difficulties	3	3
Flaky skin		1
Floppiness		1
Flu	1	
Hernia	3	1
High temperature	1	2
Milk allergy	1	
Rash	2	2
Slow weight gain		1
Snuffy		3
Sticky eyes	3	1
Throat infection		1
Thrush	1	
Twitching sleep	1	
Vomiting/sickness	4	
<b>Total</b>	<b>33</b>	<b>31</b>

Table 7 shows that the majority of mothers in both groups reported multiple health concerns. In total, the 13 NNU mothers reported 33 health-related worries and the 16 PNW mothers reported 31 similar worries that ranged over 17 health issues. When the worries were physiologically grouped together, they predominately related to respiratory function and feeding issues.

There were seven mothers in both groups who identified baby care information needs. The queries as recorded by the mothers are shown in table 8.

**Table 8 Baby care information needs**

<b>Baby care information needs</b>	
<b>Neonatal unit mothers n=7</b>	<b>Postnatal ward mothers n=7</b>
Breastfeeding – milk supply	Birth mark, eczema, weaning, very sleepy
Changing from breast to bottle feeding	Care of penis and umbilicus stump
Breast / bottle feeding & weaning	Colic – what to give to help
Eye care	Feeding frequency and colic
Feeding	Feeding, skin, sleepy, crying, general behaviour
Timing of immunisations	Settling after feeds – how long to leave
Top ups after breastfeeding	Terry nappies – advice to prevent nappy rash

Table 8 shows that the NNU mothers reported mainly single issue queries. Five of the NNU mothers had queries related to feeding and the other queries referred to eye care and immunisation schedules. When a baby is born prematurely, the appropriate timing of immunisations and weaning are issues that cause confusion to parents and health professionals unfamiliar with the needs of premature babies and frequently result in parents receiving conflicting advice.

Five of the PNW mothers also had feeding related queries. Three mothers had multiple questions that concerned feeding, skin care, umbilical cord care and normal sleeping and crying behaviour. These questions suggest that the PNW mothers were less experienced at routine baby care and less knowledgeable about normal baby behaviour than the NNU mothers who tended to ask for specific information.

### **Summary of worries and information needs**

There were no significant differences between the number of NNU mothers and PNW mothers who reported that they had health worries and baby care related information needs since discharge home. The worries reported were similar for both groups of mothers and were mainly related to respiratory function and feeding issues. The information needs reported also had feeding as a common focus. However, the information needs of the PNW mothers appeared to be less specific than those of the NNU mothers and inferred that the PNW mothers were less experienced at mothering and had less knowledge of normal baby behaviour than the NNU mothers.

### **Baby health care events experienced**

This section of the questionnaire related to baby health care events actually experienced during the weeks since the baby was discharged home. These findings addressed -

objective (xvii) – to identify the actual baby health care events experienced by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.

The baby health care events or behaviours actually experienced by NNU and PNW mothers are shown in the table 9.

**Table 9 Baby health care events experienced (n=48)**

Health care event or behaviour	NNU mothers n=24 YES (%)	PNW mothers n=24 YES (%)	Difference between groups p-value
<b>Runny/blocked nose</b>	18 (75.0)	17 (70.8)	0.75
<b>Colic</b>	17 (70.0)	13 (54.2)	0.23
<b>Cough</b>	14 (58.3)	12 (50.0)	0.56
<b>Sticky eyes</b>	13 (54.2)	10 (41.7)	0.39
<b>Runny bowel motions</b>	9 (37.5)	6 (25.0)	0.35
<b>Just not him/her self</b>	9 (37.5)	6 (25.0)	0.35
<b>Rash</b>	8 (33.3)	11 (45.8)	0.38
<b>Noisy/difficult breathing</b>	8 (33.3)	9 (37.5)	0.76
<b>Increased irritability</b>	8 (33.3)	5 (20.8)	0.33
<b>Constipation</b>	7 (29.2)	7 (29.2)	1.00
<b>Feeling too hot or too cold</b>	7 (29.2)	5 (20.8)	0.50
<b>Reluctance to feed</b>	6 (25.0)	6 (25.0)	1.00
<b>Repeated vomiting</b>	6 (25.0)	2 (08.2)	0.24 <sup>a</sup>
<b>Unusual or persistent cry</b>	5 (20.8)	1 (04.2)	0.19 <sup>a</sup>
<b>Jaundice</b>	4 (16.7)	9 (37.5)	0.10
<b>Colour changes (blue/pale)</b>	4 (16.7)	4 (16.7)	1.00 <sup>a</sup>
<b>Increased sleepiness</b>	4 (16.7)	3 (12.5)	1.00 <sup>a</sup>
<b>Poor weight gain</b>	4 (16.7)	2 (08.3)	0.67 <sup>a</sup>
<b>Floppiness</b>	3 (12.5)	1 (04.2)	0.61 <sup>a</sup>
<b>Nappies less wet than usual</b>	2 (08.3)	1 (04.2)	1.00 <sup>a</sup>
<b>Decreased activity</b>	2 (08.3)	0	<sup>b</sup>
<b>Unusual movements</b>	2 (08.3)	0	<sup>b</sup>
<b>Lump in groin</b>	1 (04.2)	0	<sup>b</sup>
<b>Bleeding from the umbilicus</b>	0	3 (12.5)	<sup>b</sup>

<sup>a</sup> = Fisher's Exact test

<sup>b</sup> = cell count too small to calculate p-value

In table 9, Chi-squared and Fisher's Exact tests where indicated, show no significant differences between the baby health care events experienced by the NNU mothers and the PNW mothers. Upper respiratory tract infection with blocked or runny nose, cough and noisy/difficult breathing were equally common events for the babies of both the NNU and PNW mothers. Although colic was a common occurrence, more NNU mothers (70%) had experience of dealing with colic than the PNW mothers (54%). Runny bowel motions were

more common in the NNU babies (n=9) compared with PNW (n=6) babies whilst constipation was experienced equally by both groups. A baby with reluctance to feed was experienced by six mothers in each group although vomiting was three times more common and poor weight gain twice as common in the NNU babies than in the PNW babies. The PNW mothers saw jaundice and bleeding from the umbilicus more frequently than the NNU mothers as a reflection of the PNW baby's earlier age at discharge from hospital. However, the non-specific signs of illness in babies such as 'just not him/her self', unusual or persistent crying, floppiness, decreased activity, increased sleepiness and unusual movements were all seen by more NNU mothers than the PNW mothers. The NNU mothers had probably acquired a heightened awareness of the significance of the non-specific signs of illness in babies whilst their baby was in a NNU.

### **Summary of baby health care events experienced**

There were no significant differences between the baby health care events or behaviours experienced by the NNU mothers and the PNW mothers. However, more NNU mothers than PNW mothers reported non-specific signs of infection in their baby.

### **Mothers' contacts with primary care health professionals**

The number of contacts mothers had with primary health care professionals and the mothers' level of satisfaction with the information and support they received addressed - **objective (xvi) – to identify the level of satisfaction with present sources of professional health information and support expressed by mothers who had their baby discharged from a neonatal unit, and to compare this with mothers discharged home following standard postnatal care.**

**objective (xx) – to identify the professional and informal sources of information, advice and support accessed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

The mothers who had contact with primary health care professionals are shown in table 10.

**Table 10** Mothers' contacts with primary care health professionals (n=48)

	NNU mothers n=24 (%)	Total contacts NNU mothers n=24	PNW mothers n=24 (%)	Total Contacts PNW mothers n=24
<b>Community Midwife (CM)</b>				
home visit	9 (38)	not recorded	23 (96)	not recorded
<b>Health Visitor (HV)</b>				
home visit	24 (100)	127	24 (100)	101
clinic visit	18 (75)	77	21 (88)	63
mother phoned HV	16 (67)	30	9 (38)	19
HV phoned mother	16 (67)	44	13 (54)	17
<b>General Practitioner (GP)</b>				
home visit	9 (38)	11	17 (71)	18
surgery visit	21 (88)	36	18 (75)	35
Mother phoned GP	8 (33)	11	6 (25)	10
<b>Total</b>		<b>336</b>		<b>263</b>

### **Mothers' contacts with a community midwife**

Table 10 shows that only 9 (38%) NNU mothers were visited at home by a community midwife (CM) compared with 23 (96%) PNW mothers, the number of visits per mother was not recorded. Although a CM has responsibility for mothers and babies up to 28 days post delivery, home visits generally cease on the tenth postnatal day, unless either the mother or baby are unwell, and primary care support is usually transferred to the health visitor on the eleventh postnatal day. Since the majority of babies discharged home from a NNU were older than 10 days, a CM would not routinely visit the NNU mothers.

### **Mothers' contacts with a health visitor**

Table 10 shows health visitors (HV) made home visits to all mothers in both groups. Health visitor contacts with the NNU mothers at home were more frequent with 127 visits (median 4.5, IQR 3.0 – 6.0 visits) compared with 101 visits to the PNW mothers (median 4, IQR 2.3 – 5.0).

One-quarter (n=6) of the NNU mothers never attended the HV's clinic but the greater number of home visits made to this group probably accounted for this. The remaining 75% (n=18) of NNU mothers attended HV clinics between 1-14 times since their baby's discharge home. Three PNW mothers never attended the HV clinic and the remaining 21 (88%) mothers attended between 1-12 times each. The total number of clinic visits by the NNU mothers was 77 compared with 63 by the PNW mothers.

Sixteen (67%) NNU mothers initiated telephone contact with a HV on 30 occasions. Nine (38%) mothers telephoned on one occasion only, the remaining seven mothers made between two and six calls each. Nine (38%) PNW mothers made telephone calls to their HV on 19 occasions. Four (17%) mothers telephoned on one occasion only and the other five mothers made between two and six calls each.

Eight (33%) NNU mothers did not receive any telephone calls from their HV. Sixteen (67%) NNU mothers received 44 telephone contacts from a HV, 11 (46%) mothers received one or two telephone calls and five mothers received between 4-7 telephone calls from their HV. Eleven (46%) PNW mothers did not receive any telephone contacts from their HV. The remaining 54% of PNW mothers received 17 telephone contacts, 12 (50%) mothers received one or two telephone calls each and one mother received three telephone calls from her HV.

#### **Mothers' contacts with a general practitioner**

Table 10 shows that general practitioners (GP) made 11 home visits to nine (38%) NNU babies compared with 18 home visits to 17 (71%) PNW babies. Twenty-one (88%) NNU mothers made 36 visits to the GP's surgery (median 1.0, IQR 1.0 – 2.0) and 18 (75%) PNW mothers made 35 visits to the GP's surgery (median 1.5, IQR 0.25 – 2.0). Eight (33%) NNU mothers contacted their GP by telephone on 11 occasions and six (25%) PNW mothers initiated ten telephone contacts with their GP.

Overall, table 10 showed the total number of primary health care professional contacts was 336 for NNU mothers compared with 263 for PNW mothers. However, the increased number of health professional contacts with NNU mothers does not necessarily imply that they received greater support or information. Tables 11 and 12 show the reported level of mothers' satisfaction with the information and support received from primary health care professionals.

**Table 11** Mothers' satisfaction with information received from health care professionals (n=48)

Information source	NNU mothers n=24					PNW mothers n=24					Difference between groups p-value
	n=	A	B	C	D	n=	A	B	C	D	
CM	9	0	0	5	4	23	0	0	8	15	0.43 <sup>1</sup>
HV	24	1	0	17	6	24	0	2	7	15	0.01
GP	23	2	4	8	9	21	0	1	10	10	0.26
Total		3	4	30	19		0	3	25	40	

**Table 12** Mothers' satisfaction with support received from health care professionals (n=48)

Source of support	NNU mothers n=24					PNW mothers n=24					Difference between groups p-value
	n=	A	B	C	D	n=	A	B	C	D	
CM	9	0	0	6	3	23	0	0	8	15	0.26 <sup>1</sup>
HV	24	1	1	14	8	24	0	1	7	16	0.11
GP	23	1	3	10	9	21	0	1	9	11	0.54
Total		2	4	30	20		0	2	24	42	

A = very dissatisfied

B = dissatisfied

C = satisfied

D = very satisfied

<sup>1</sup> = Fisher's Exact test

CM = community midwife HV = health visitor GP = general practitioner

### Mothers' satisfaction with community midwife contacts

Tables 11 and 12 show that nine NNU mothers had contact with a CM and all were 'satisfied' or 'very satisfied' with the information and support they received from their CM. In the PNW group, 23 mothers were visited at home by a CM and all were 'satisfied' or 'very satisfied' with the information and support they received. The one PNW mother who was not visited at home by a CM reported that she had been 'forgotten in error'.

### Mothers' satisfaction with health visitor contacts

In table 11, 23 out of 24 NNU mothers and 22 out of 24 PNW mothers said they were 'satisfied' or 'very satisfied' with the information they received from a HV. However, one NNU mother was 'very dissatisfied' and two PNW mothers were 'dissatisfied' with the information they received.

In table 12, 22 NNU mothers and 23 PNW mothers said they were 'satisfied' or 'very satisfied' with the support they received from their HV. However, one NNU mother was

'very dissatisfied' and one NNU and one PNW mother were 'dissatisfied' with the support they received from a health visitor.

### **Mothers' satisfaction with general practitioner contacts**

In table 11, 17 out of 23 NNU mothers and 20 out of 21 PNW mothers reported being 'satisfied' or 'very satisfied' with the information they received from their GP. Of the remaining six NNU mothers, two were 'very dissatisfied' and four were 'dissatisfied' with the information received from a GP compared with one 'dissatisfied' PNW mother.

In table 12, 19 out of 23 NNU mothers and 20 out of 21 PNW mothers were 'satisfied' or 'very satisfied' with the support they received from their GP. Of the remaining four NNU mothers, one was 'very dissatisfied' and three were 'dissatisfied' with the support received from a GP compared with one 'dissatisfied' PNW mother.

Therefore, the majority of NNU mothers and PNW mothers indicated that they were 'satisfied' or 'very satisfied' with the information and support received from the primary health care team. Chi-squared tests and Fisher's Exact tests showed that significantly fewer NNU mothers than PNW mothers were specifically 'very satisfied' with the information they received from health visitors ( $p=0.01$ ). There were no other significant differences between the NNU and PNW mothers for their expressed level of satisfaction with the information and support received from community midwives, health visitors and general practitioners. However, the NNU mothers made a total of 13 indicators of being 'dissatisfied' or 'very dissatisfied' with the information or support received from HVs and GPs compared with five expressions of dissatisfaction from the PNW mothers. There were no indicators of dissatisfaction with the information or support received from community midwives.

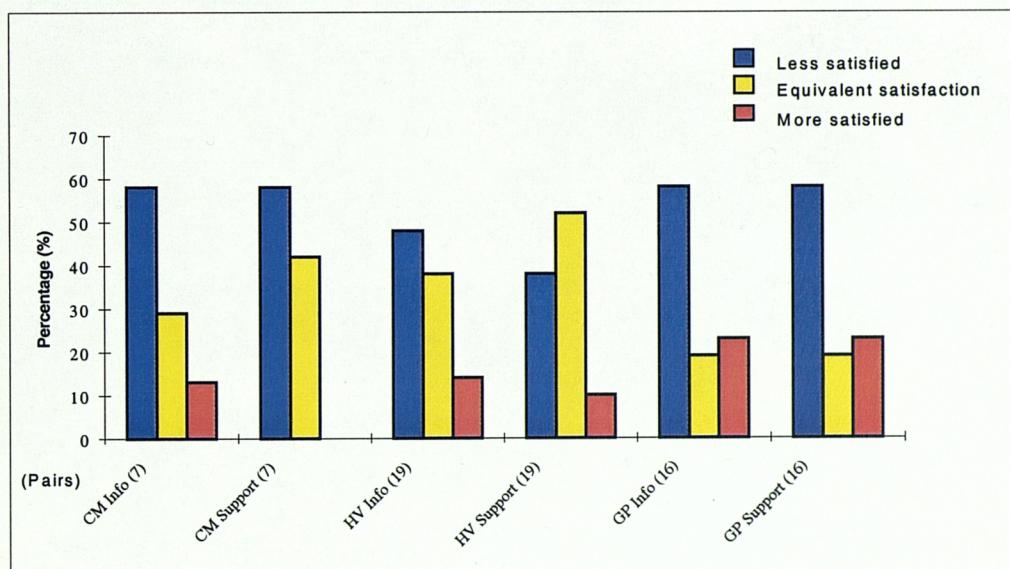
### **Satisfaction with health professionals by matched pairs of mothers**

The level of satisfaction with information and support received from health professionals was compared between the NNU mothers and their matched or paired PNW mothers in figure 3. The percentage responses of the NNU mothers were compared as less, equivalent or more satisfied than their matched PNW mother. The numeric value attributed to the response on the Likert scale given by the NNU mother was subtracted from that of the PNW mother. The categories of less, equivalent or more satisfied are therefore relative so that if a NNU mother responded 'moderately satisfied' (3) and the PNW mother

responded 'very satisfied' (4) the NNU mother would be classified as 'less satisfied' than the PNW mother even though both expressed a positive level of satisfaction.

As previously stated, only nine of the NNU mothers had any contact with a CM therefore the number of matched pairs of mothers was low compared with the number of paired mothers for HV and GP contacts.

**Figure 3 Satisfaction with health professionals comparing neonatal unit mothers with paired postnatal ward mothers**



Info = information

Figure 3 shows that, a higher percentage of NNU mothers were less satisfied than their paired PNW mother with the information they received from CMs, HVs, and GPs. The majority of NNU mothers compared with their paired PNW mothers were also less satisfied with the support they received from their CM and GP however, the majority indicated an equivalent level of satisfaction with the support they received from health visitors.

#### **Summary of mothers' satisfaction with primary health professional contacts**

The number of contacts with primary care health professionals was greater for NNU mothers (n=336) compared with PNW mothers (n=263). The only significant differences between the NNU and PNW mothers for their expressed level of satisfaction with the information or support they received from community midwives, health visitors or general practitioners was that fewer NNU mothers than PNW mothers were specifically 'very satisfied' with the information they received from health visitors ( $p=0.01$ ). However, more NNU mothers expressed that they were 'dissatisfied' or 'very dissatisfied' with the

information and support received from health visitors and general practitioners than the PNW mothers.

More NNU mothers compared with their paired PNW mother were less satisfied with the information they received from health visitors however, the majority indicated an equivalent level of satisfaction with the support they received from health visitors. The majority of NNU mothers were also less satisfied than their paired PNW mothers with the information and support received from community midwives and general practitioners.

### Information, advice and support

#### **Sources accessed by mothers**

Mothers were asked to tick 'yes' or 'no' to indicate whether they had contacted any of the formal and informal sources of information, advice and support listed. These findings address -

**objective (xx) – to identify the professional and Informal sources of information, advice and support accessed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

The sources of information and support accessed by NNU and PNW mothers are shown in table 13.

**Table 13 Sources of information, advice and support contacted by mothers (n=48)**

Sources of information, advice and support contacted	NNU mothers n=24 YES (%)	PNW mothers n=24 YES (%)	Difference between groups p-value
Family member	13 (54.2)	19 (79.2)	0.07
Friend / neighbour	10 (41.7)	15 (65.2)	0.15
Chemist / pharmacist	9 (37.5)	16 (66.7)	0.04
Community Midwife	5 (20.8)	4 (16.7)	1.00 <sup>a</sup>
Postnatal ward at Hospital	1 (4.2)	4 (16.7)	0.35 <sup>a</sup>
Parent group	1 (4.2)	1 (4.2)	1.00 <sup>a</sup>
Telephone Helpline	0 (0)	1 (4.2)	b
Community Paediatric Nurse	1 (4.2)	0 (0)	b
Ambulance service	0 (0)	0 (0)	b
A & E Department	0 (0)	0 (0)	b
Others - health visitor	3 (2.5)	4 (6.7)	1.00 <sup>a</sup>
- general practitioner	0 (0)	1 (4.2)	b

<sup>a</sup> = Fisher Exact's test

<sup>b</sup> = cell count too small to calculate p-value.

In table 13, Chi-squared and Fisher's Exact tests where indicated, show that there was only one source of information, advice and support that was significantly different between NNU and PNW mothers. Significantly more PNW mothers accessed a pharmacist as a source of information and advice than NNU mothers ( $p=0.04$ ). Family members were the most frequently cited sources of information, advice and support accessed however, fewer NNU mothers specifically indicated that they consulted with family members than PNW mothers. Similarly, fewer NNU mothers than PNW mothers contacted friends or neighbours for information, advice or support even though they might have been available. Therefore with fewer immediate sources of support accessed by the NNU mothers they might feel more isolated than the PNW mothers. Telephoning for information, advice and support was not common with either group of mothers. Four PNW mothers and one NNU mother telephoned the PNW for health advice regarding their baby. One PNW mother telephoned a helpline and only one mother in each group attended a parent group. However, the number of times each source was accessed by individual mothers was not recorded therefore it was not possible to report on the frequency of help-seeking behaviour.

### **Potential sources of information, advice or support**

Recognition by the NNU mothers and PNW mothers of potential sources of information, advice and support did not seem to reflect their actual help-seeking behaviour described in table 13. Health visitors and GPs followed by family and friends were the most cited potential sources of information, advice and support recognised by the NNU mothers and the PNW mothers. In terms of perceived potential to provide support, partners ranked after health professionals, other family members and friends for both groups of mothers. Although there was no formal post discharge advice service offered by the NNU, three NNU mothers said they would telephone for advice and a further three would make personal visits to seek advice.

In response to specific questions, 11 NNU mothers and 11 PNW mothers stated they would use a telephone helpline that was specifically designed to meet the information and support needs of new parents and a further ten mothers in each group said they would consider using such a helpline.

### **Summary of sources of information, advice and support accessed by mothers**

The only significant difference in the sources of information, advice and support accessed by the NNU and PNW mothers was that more PNW mothers consulted a pharmacist

( $p=0.04$ ). However, fewer NNU mothers than PNW mothers consulted with family members, friends or neighbours for information, advice or support. Perceived potential sources of information, advice and support did not necessarily reflect the sources actually accessed. Presentation of the findings of the questionnaire has now been completed. The following section of this chapter reports the findings of the health diaries.

## **HEALTH DIARY**

The following findings contributed to the fulfilment of –

**objective (xvi) – to identify the level of satisfaction with present sources of professional health information and support expressed by mothers who had their baby discharged from a neonatal unit, and to compare this with mothers discharged home following standard postnatal care.**

**objective (xviii) – to discover the worries and concerns expressed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

**objective (xx) – to identify the professional and informal sources of information, advice and support accessed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

### **Mothers who received a health diary**

The findings from the health diary related only to mothers who had their baby discharged from a NNU. Details of the returned diaries are shown in figure 4.

Figure 4 Health Diaries

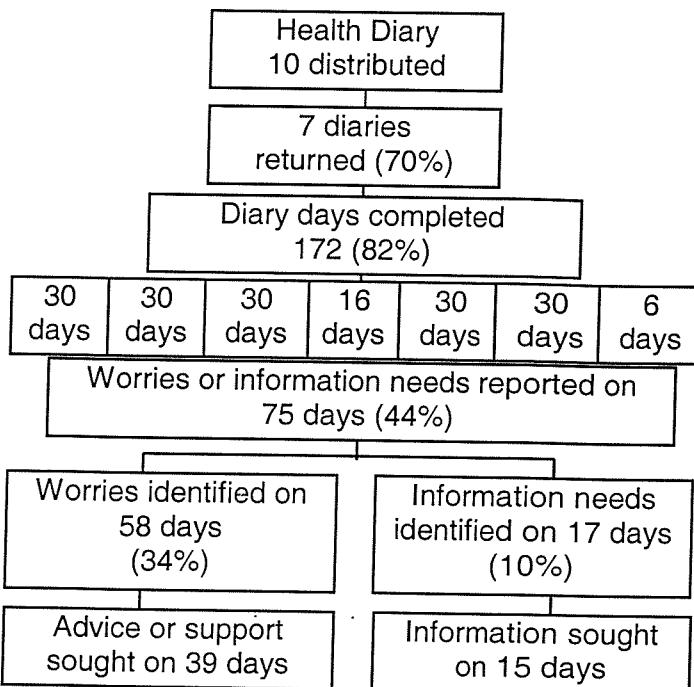


Figure 4 shows that seven out of ten (70%) diaries were returned. Five diaries had been completed on all 30 days and the remaining two diaries completed on 16 and 6 days respectively, which reflected a total of 172 days of baby care following discharge home from a NNU. The mothers reported worries about their baby's health or behaviour on 58 days (34%) and they sought advice or support on 39 of those days. The mothers also identified information needs on 17 days (10%) and they sought information on 15 of those days.

#### Worries about the baby's health or behaviour

Table 14 shows the degree and frequency of worry indicated by the mothers.

Table 14 Degree and frequency of worry reported by mothers

Degree of worry	Days reported in Health Diary (%)
Not at all worried	114 (66.3)
Slightly worried	32 (18.6)
Moderately worried	19 (11.0)
Very worried	7 ( 4.1)
<b>Total</b>	<b>172 (100)</b>

Table 14 shows mothers' recorded worries about the baby's health or behaviour on 58 days (34%). On 32 days mothers indicated they were 'slightly worried' and on 26 days mothers reported they were 'moderately worried' or 'very worried'. Feeding issues including colic, vomiting and constipation were the most frequently reported worry (n=23) followed

by signs of upper respiratory tract infection (n=11). Non-specific signs such as irritable behaviour, unusual cry and 'just not him/her self' caused reported worry on seven days. Two mothers identified four days each of 'baby care worries' and another mother identified 11 days of 'general new baby/mother anxiety'. These days included anxieties about taking the baby out and separation issues that related to leaving the baby with someone or being absent for a feed as well as 'general worries'. More than one worry was reported on some days.

### **Advice and support sought by mothers in relation to worries**

Advice and support in relation to the worries reported was sought on 39 of the 58 days (67%). The mother's partner was the most frequent source of advice or support (n=18) followed by the HV (n=14) and the GP (n=10). Friends and family members provided a source of advice or support on six occasions and a pharmacist was consulted once. More than one person per day was consulted on 12 days. Mothers who identified worries consulted with no one on 18 days (31%) and information was missing for one mother on one day.

### **Satisfaction with advice and support received**

The level of satisfaction with the advice or support received was recorded on 50 occasions. Mothers were generally 'satisfied' or 'very satisfied' with the advice and support they received from 47 people. Only one mother reported being 'generally dissatisfied' with advice or support received on two days, once from her partner and twice from a health visitor.

On 15 days mothers recorded that the advice they had been given enabled them to alter their baby care in accordance with the advice given. The advice given was ignored on two days.

### **Information needs of mothers**

Eighteen information needs were reported on 17 days, 10% of the post discharge baby care days. The most frequent information needs focused on feeding issues, including colic and elimination, which generated nine information queries and general baby care information needs were recorded on six days. Queries about normal developmental progress, immunisations and follow-up were also reported as information needs.

### **Information sought by mothers**

In an attempt to address the 18 information needs identified, the mothers sought answers from HVs on eight issues and family members on two occasions. One mother referred to 'baby care books' for the information she required twice and another sought information from specialist health professionals three times. Answers were not sought for three identified information needs.

### **Satisfaction with information received**

The level of satisfaction with the information received in response to eleven identified information needs was reported. On ten occasions the mothers recorded they felt 'generally' or 'very satisfied' with the information received. Only one mother reported feeling 'generally dissatisfied' with information received from a health visitor. The active response to the information given was recorded on eight occasions. On seven occasions mothers acted on the information given and on one occasion the mother did not.

### **Summary of the health diaries**

Seven out of ten health diaries given to mothers who had their baby discharged home from a NNU were returned and completed on 82% of the available days. Worries or information needs were reported on 44% of the 172 days completed. Feeding issues and concerns about the baby's respiratory function were the most frequent causes of worry. Mothers sought advice and support on 39 days in relation to their worries and the majority were 'generally satisfied' or 'very satisfied' with the advice and support they received from health professionals and others. Mothers identified 18 information needs, mainly about feeding related issues and general baby care, and sought information from health professionals, family members and 'baby care' books. The majority of mothers were 'generally satisfied' or 'very satisfied' with the information they received.

The following section in this chapter presents the findings of the telephone logs.

## **TELEPHONE LOGS**

The findings of the telephone logs addressed -

**objective (xix) – to identify the extent to which mothers and others access baby care information and advice via the telephone.**

**objective (xviii) – to discover the worries and concerns expressed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

#### **Location and duration of telephone logs**

Telephone logs were established at four hospital-based locations where it was considered that mothers and other carers of babies might seek health information and advice. The location, duration of the log and calls received that related to babies are shown in table 15.

**Table 15      Location, duration and number of calls recorded in telephone logs**

<b>Location of telephone log</b>	<b>Duration of log</b>	<b>Total number of calls recorded</b>	<b>Recorded calls per month</b>
<b>Postnatal ward</b>	5 weeks	39	31
<b>Infant Feeding Specialist</b>	6 months	110	18
<b>Accident &amp; Emergency Dept.</b>	9 months	75	8
<b>Neonatal Unit</b>	20 months	71	4

Table 15 shows the location and duration of the telephone logs and the number of calls recorded that concerned baby health or care issues or baby related information needs. The Postnatal Ward log recorded most calls per month (n=31), followed by the Infant Feeding Specialist (n=18), the Accident and Emergency Department (n=8) and the Neonatal Unit (n=4).

#### **Postnatal Ward telephone log**

The Postnatal Ward (PNW) telephone log was maintained for five weeks. Telephone calls received that were not related to current patients were recorded by any grade of staff, although calls requiring clinical information were always referred to a midwife, and 327 calls were recorded in total. Information seeking calls from the public and health professionals and clinical calls that related to the mother accounted for 288 calls. The remaining 39 calls (12%) related to enquires about baby health care or behaviour, the findings presented relate to these 39 calls.

The baby focused calls occurred throughout the 24 hours, 20 calls were received between 0900-1700 hours and 19 calls were received 'out of hours'. However, only five calls were received between 0830-1300 hours when clerical staff were available to answer administration enquiries or appropriately triage the telephone call to a midwife. As many as

50% of baby related calls occurred between 1330-1900 hours when clerical staff were not available to answer the telephone.

Parents made the majority (85%) of calls. Mothers were the most frequent caller and made 24 calls whilst fathers made 9 calls. Five health professionals (13%) telephoned to obtain or confirm information on behalf of mothers. The identity of one caller was not recorded. Age was recorded for 30 babies with the median age of 10 days (IQR 4 – 19.5 days). This was an unexpected finding as the community midwife has practical and legal responsibility for the welfare of mother and baby until ten days post delivery, which can be extended until 28 days post partum if necessary. Within each team of community midwives at least one midwife was available 'on-call' 24 hours a day. Therefore given the availability of a CM to personally address parents' worries or information needs it was unclear why parents chose to telephone the PNW. The reason, frequency and duration of the telephone calls are presented in table 16.

**Table 16 Frequency and percentage of telephone calls to the Postnatal Ward by reason for call and duration of call (n=39)**

Duration of call minutes	Reason for call			Total
	Information n= (%)	Feeding n= (%)	Baby Care n= (%)	
1 - 3	6 (15)	5 (13)	9 (23)	20 (51)
4 - 6	2 (5)	3 (8)	4 (10)	9 (23)
7 – 9			2 (5)	2 (5)
10 – 12				
13 – 15	2 (5)	2 (5)	1 (3)	5 (13)
16 +		1 (3)		1 (3)
Not recorded		1 (3)	1 (3)	2 (5)
Total	10 (26)	12 (31)	17 (44)	39 (100)

Table 16 shows the reason for the telephone calls to the PNW in three broad categories; information (n=10), feeding (n=12) and baby care issues (n=17). The duration of 37 calls was recorded and the median length of call was three minutes (IQR 2 – 5 minutes). The total duration of information calls was 53 minutes, feeding calls 82 minutes and baby care calls 69 minutes.

#### Infant Feeding Specialist telephone log

During a six month period, November 1993-April 1994, 110 calls were recorded by the Infant Feeding Specialist (IFS). Although the IFS was officially only available during 'office hours' some calls were received 'out of hours'. The duration of calls was recorded for 105

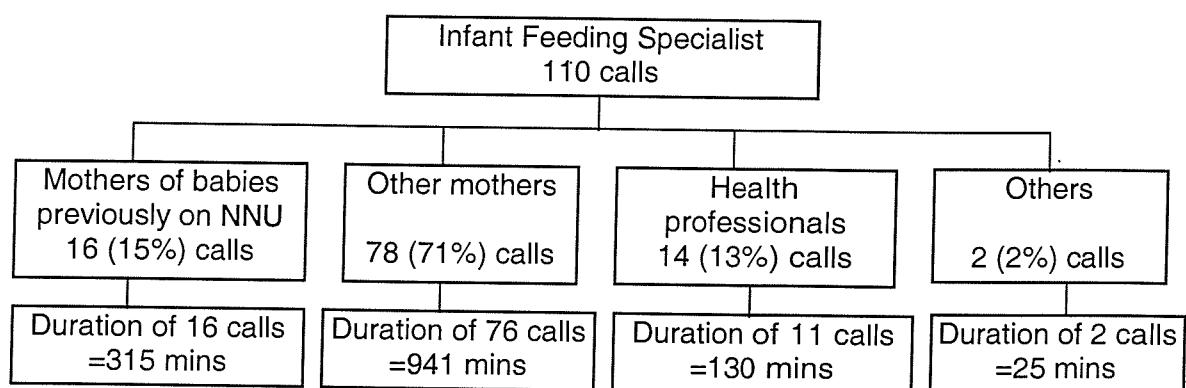


calls (95%) and accounted for 1411 minutes (23.5 hours) of the IFS's time. There were four categories of caller:-

- mothers of babies discharged from the Neonatal Unit
- other mothers
- health professionals
- others

The number and duration of calls received by each category of caller are shown in figure 5.

**Figure 5 Telephone calls to the Infant Feeding Specialist**



**Telephone calls to the Infant Feeding Specialist from mothers of babies previously discharged from the Neonatal Unit**

In figure 5, 16 (15%) calls were from mothers who had their baby discharged from a NNU and these calls accounted for 315 minutes or 22% of the total recorded time spent on telephone calls. Two mothers telephoned on five separate occasions. One of these mothers made her calls over nine weeks, whilst the other mother called over a three week period, which suggests persistent or recurring problems. The age of the baby was recorded for 13 (81%) calls and ranged between 4-19 weeks (mean 11 weeks). The time since discharge from hospital was recorded for 11 (69%) calls and ranged between 1-8 weeks (mean 3.6 weeks). All calls, except two calls from one mother, occurred during office hours. The subject of these calls broadly divided into feeding information/queries (n=6) and feeding problems (n=10).

### **Telephone calls to the Infant Feeding Specialist from other mothers**

Mothers who, with their baby, had standard postnatal care made 78 calls and represented 71% of the total calls to the IFS. The total time spent on these calls was recorded for 76 (97%) calls and accounted for 941 minutes. Fifty-seven (73%) calls were received in office hours and 21 (27%) were received 'out of hours'. The age of the babies concerned ranged from four days to three years and the time since discharge from hospital ranged from one day to three years. These calls broadly divided into feeding information/queries (n=13) and feeding problem (n=65).

### **Telephone calls to the Infant Feeding Specialist from health professionals**

Fourteen (13%) calls were from health professionals seeking information or advice from the IFS to enable them to pass on accurate information to their client. Health visitors were the largest group of health professionals to call and they made 10 calls, two calls were from community midwives, and one each from a general practitioner and a nursery nurse. The duration of health professional calls was not recorded on three occasions but the remaining 11 calls accounted for 130 minutes or 9% of time spent answering telephone calls. All except one call occurred during office hours. The age of the baby concerned was recorded for 10 calls and ranged between four days and three months (median 5 weeks). The age of the baby was not recorded for four calls. The time since discharge from hospital was recorded for 10 babies and ranged between two days and three months (median 4 weeks). None of the information or advice requested related to babies previously discharged from a NNU. The recorded calls from health professionals broadly divided into feeding information/queries (n=8) and feeding problems (n=6).

### **Telephone calls to the Infant Feeding Specialist from others**

The IFS received two telephone calls from other breastfeeding counsellors seeking information. The duration of these calls totalled 25 minutes and represented approximately 2% of the IFS's time spent on telephone calls.

### **Accident and Emergency Department telephone log**

Information was abstracted from the telephone log maintained in the Accident and Emergency Department (A & E) for nine months from March to November 1994. The number of calls received per month are shown in table 17.

**Table 17 Telephone calls logged in the Accident & Emergency Department**

Month 1994	Total telephone calls from public recorded	Recorded calls relating to babies aged 1 year or less
March	184	8 (4%)
April	181	10 (10%)
May	223	5 (2%)
June	204	10 (5%)
July	223	15 (7%)
August	184	8 (4%)
September	135	6 (4%)
October	196	6 (3%)
November	201	7 (3%)
<b>Total</b>	<b>1,731</b>	<b>75 (4%)</b>

Table 17 shows a total of 1,731 telephone calls (mean 192 calls per month / 6 calls per day) were recorded over nine months from the general public requesting health information or advice and 75 (4%) of these calls related to babies under one year of age.

Fifty-two (69%) baby related calls were made on weekdays and 23 calls (31%) were made at weekends, with Saturday as the day when most calls, 16 (21%), were received. The time of the call was recorded for 58 calls. Twenty-three calls (40%) were made between 9am - 5pm, Monday to Friday and 35 calls (60%) were made outside office hours. Twenty-one calls (36%) occurred between 5pm on a Friday and 9am on a Monday during which time health visitors were not available to provide health care advice and the general public were encouraged to call general practitioners for emergencies only.

The reasons for the telephone call to A & E and age of the baby are shown in table 18.

**Table 18 Frequency and percentage of telephone calls to the Accident and Emergency Department by reason for call and by age of baby (n=75)**

Age in weeks	Reason for call								Total n= (%)
	Feeding n= (%)	Infection n= (%)	Ingestion n= (%)	Head injury n= (%)	Misc. n= (%)	Baby care n= (%)	Drug info. n= (%)	Skin n= (%)	
1 - 4				3 (4)	1 (1)	1 (1)			5 (7)
5 - 8		1 (1)		2 (3)	1 (1)			1 (1)	5 (7)
9 - 12		2 (3)			1 (1)		2 (3)	1 (1)	6 (8)
13 - 16	1 (1)				1 (1)				2 (3)
17 - 20		3 (4)	1 (1)	1 (1)					5 (7)
21 - 24			1 (1)	2 (3)					3 (4)
25 - 28		1 (1)	3 (4)					2 (3)	6 (8)
29 - 32			4 (5)	3 (4)	1 (1)				8 (11)
33 - 36		3 (4)	1 (1)	2 (3)					6 (8)
37 - 40		1 (1)	5 (7)						6 (8)
41 - 44		1 (1)	3 (4)	4 (5)			1 (1)		9 (12)
45 - 48					2 (3)				2 (3)
49 - 52		2 (3)	4 (5)	4 (5)		1 (1)			11 (15)
NR		1 (1)							1 (1)
Total	1 (1)	15 (20)	22 (29)	21 (28)	7 (9)	2 (3)	3 (4)	4 (5)	75 (100)

NR = not recorded      Misc. = miscellaneous topics

Table 18 shows that the reason for the call was recorded for all 75 calls. Age was recorded for 74 babies and ranged from one week to one year (median 32, IQR 18.75 – 44 weeks). The age of one baby was not recorded but was assessed to be less than one month because of the nature of the problem (umbilical cord infection).

Ingestion (n=22), head injury (n=21) and infection (n=15) were the most frequent reasons for seeking health information or advice. Requests were also made for medication information (n=3) and advice regarding the management of skin conditions (n=4) such as eczema and rashes. Feeding issues (n=1) and baby care concerns (n=2) were infrequent reasons for calling the A & E Department and only occurred in relation to infants less than four months of age. The remaining seven calls were classified as miscellaneous. Calls related to babies less than 12 weeks of age were associated with infection, head injury, baby care, drug information, skin care and other miscellaneous 'new baby' issues. The cluster of calls regarding head injury, ingestion and infection that occurred from 20 weeks of age until one year probably reflects the hazards of normal social and motor development.

The identity of the caller was recorded for 50 calls. Mothers and female callers were the most frequent carers seeking information or advice about a baby. They made three times as many telephone enquires as fathers and male callers.

### Neonatal Unit telephone log

A telephone log was maintained on the NNU during the 20 months between June 1993 and February 1995. During that period 71 telephone calls from parents, relatives and others seeking information, advice or support not related to in-patients were recorded. It was acknowledged that the log was not a complete record of all calls received and should therefore be regarded as a sample only. Parents made 60 (85%) calls with mothers being the most frequent caller (47 calls). Grandparents, friends or relatives made six calls (9%) and health professionals made five calls (7%).

The majority (82%) of calls were related to babies previously discharged from the NNU. The baby for whom the information was requested was not recorded for three calls. Three calls made by health professionals were requesting general information relating to newborn babies.

The time of receiving a telephone call was recorded for 67 calls and ranged from 00.10 - 2330 hours. Thirty-two (48%) calls were received during office hours when members of the primary care team were also available. The majority of calls (78%) occurred between 0900-1600 hours when ward clerical staff were available to triage the call to the most appropriate member of staff. Of the 35 calls received 'out of hours', 23 were answered by nurses working on a day shift and the remaining 12 calls were answered by nurses working on a night shift. The duration and reason for the calls are presented in table 19.

**Table 19 Frequency and percentage of telephone calls to the Neonatal Unit by reason for call and duration of call (n=71)**

Duration of call minutes	Reason for call			Total n= (%)
	Information n= (%)	Feeding n= (%)	Baby care n= (%)	
1 - 5	11 (15)	6 (8)	15 (21)	32 (45)
6 - 10	7 (10)	10 (14)	4 (7)	21 (30)
11 - 15	2 (3)	2 (3)	2 (3)	6 (8)
16 - 20		1 (1)		1 (1)
21+			1 (1)	1 (1)
Not recorded	2 (3)	5 (7)	3 (4)	10 (14)
Total	22 (31)	24 (34)	25 (35)	71 (100)

Table 19 shows the reasons for the call were requests for information (n=22), to seek advice or support with feeding problems (n=24) or baby care/health issues (n=25). The duration of 61 calls was recorded and ranged from 2-40 minutes (median 5, IQR 5 - 10

minutes), the duration of 10 calls was not recorded. Baby care calls accounted for a total of 171 minutes, feeding calls 166 minutes and information calls totalled 142 minutes.

Thirty-seven (56%) of the non-professional callers were advised to refer to another health professional either immediately or at the next possible opportunity for more advice, assessment or treatment. The most frequent referrals were to the baby's general practitioner (n=25) or their health visitor (n=8) and other referrals included a pharmacist (n=1) and a dietician (n=3). This high referral rate might reflect a desire by the NNU staff to promote parental contact with the primary care team rather than continued dependence on the NNU after discharge, an inability of intensive care trained staff to relate to baby health and care problems in a community setting or an issue of professional 'insecurity' regarding giving telephone advice.

### **Summary of the telephone logs**

The telephone logs were established in four locations where it was thought that mothers or other carers of a baby might seek advice or information. At each of the telephone log locations mothers were the most frequent callers. Fathers and other family members were the second most frequent callers followed by health professionals, usually seeking information on behalf of a mother.

Issues that related to feeding problems or information needs were the most common reason for making a telephone call. Although the IFS received most of these calls feeding issues were also the most common reason for calling the PNW and the NNU. Callers appeared to discriminate between appropriate sources of advice and information. The A & E telephone log recorded only 4% of calls about feeding and baby care compared with 74% of calls to the Postnatal Ward and 69% of calls to the Neonatal Unit. In contrast, the A & E log was the only location to record calls which related to head injury and ingestion.

The majority of calls to A & E occurred out of office hours when the primary health care team were not available for advice and the call profile, especially head injury and accidental ingestion, suggested that 'emergency' information was required. Frequently, the advice given was to attend the A & E Department as soon as possible which indicated that the decision to ring A & E was appropriate.

The majority of calls to the Neonatal Unit telephone log were from mothers whose baby had previously been discharged from the NNU. In the Neonatal Unit log and the Postnatal

Ward log issues related to feeding and general baby care and information needs were common causes of worry and concern sufficient to seek information and support via the telephone.

Therefore there was evidence from these telephone logs that the general public, especially mothers, were willing to use the telephone as a resource for obtaining a range of health information and advice in relating to baby care issues.

### **SYNOPSIS OF CHAPTER FIVE**

This chapter has presented the findings of the questionnaire, health diaries and the telephone logs that contribute to the comparison study. These results provided a broad and detailed perspective of the baby health care experiences, worries, concerns and information needs of mothers who had their baby discharged from a NNU and mothers who were discharged home with their baby following standard postnatal care. The sources of information, advice and support accessed by mothers and their satisfaction with those sources were also described. These findings will be discussed in relation to the literature in Chapter Twelve of this thesis.

The following chapter will present the methods used for the main study.

## **CHAPTER SIX**

### **MAIN STUDY METHODS**

#### **THE AIM OF THIS CHAPTER**

The aim of this chapter is to present the methods of data collection used in the main study. The main study had two components, a randomised controlled trial (RCT) and the continuation of the comparison study.

The purpose of the RCT was to evaluate the effect of 'Baby Helpline', which offered 24-hour telephone support and information specifically for parents who had their baby discharged from a neonatal unit, and 'Baby Check', a self-assessment scoring system devised to help parents assess the severity of acute illness in babies under six months of age, on the anxiety and mood states of mothers who had their baby discharged from a neonatal unit. In addition, the characteristics of the neonatal unit (NNU) mothers that were associated with their anxiety and mood states were also identified.

The purpose of the second part of the comparison study was to discover the extent of differences in characteristics, anxiety and mood states between mothers who had their baby discharged from a NNU and mothers who were discharged home with their baby following standard postnatal care.

#### **Funding**

The South and West Regional Research and Development Directorate funded the RCT component of the main study from February 1995 to January 1997. The grant facilitated the continued half-time employment of the researcher, enabled the recruitment and employment of two half-time project nurses for fifteen months for data collection, and the recruitment, employment and training of nurses for 'Baby Helpline'. The comparison study, which involved mothers who were discharged home following standard postnatal care, was not funded.

#### **Ethical considerations**

The protocol and all documentation related to the RCT was submitted to the local Hospitals NHS Trust Ethical Committee and granted ethical approval. Due to an unavoidable delay in submitting the application for ethical approval of the comparison study, approval was not

granted until two months later. Both applications were considered and approved by the same committee.

## **RECRUITMENT OF MOTHERS TO THE MAIN STUDY**

### **Criteria for exclusion from recruitment**

Prior to commencement of the study, recruitment exclusion criteria were defined for the RCT and the comparison study. The exclusion criteria from recruitment were:-

- mothers of babies admitted to the NNU for pre-transport stabilisation prior to transfer to another unit for general or cardiac surgery. The period of such admissions is short and babies do not usually return to the NNU following surgery. The experience of these mothers was therefore not entirely comparable with the mothers of babies who required predominately medical care. The difference in maternal experience therefore had the potential to affect the baseline anxiety and mood scores recorded at the time of their baby's discharge home.
- mothers of babies who were discharged from the NNU or the postnatal ward (PNW) but who would receive their primary health care in another district. The rationale for this exclusion criterion was based on the difficulty in anticipating the districts concerned and obtaining ethical approval prior to commencement of the study and the consequent difficulties with prior communications with an extended distribution of primary health care teams.
- mothers with an active psychiatric problem currently undergoing treatment were excluded from recruitment because of the potential effect of their illness and or treatment on the results and interpretation of the outcome measures of anxiety and mood.
- mothers who were known drug or substance abusers were also excluded because the results and interpretation of the outcome measures would be unreliable.
- mothers of babies booked for delivery locally but whose baby was transferred out to another NNU and received a greater proportion of their care at that unit. The transfer of a baby between units had the potential to affect the anxiety and mood state of mothers at the time of discharge home. The experience of these mothers was not therefore entirely comparable with the majority of the mothers in the study.

- mothers unable to complete the outcome measures due to communication difficulties.
- mothers of multiple births when the complete set of babies was not admitted to the NNU. The mixed postnatal experience of these mothers, with one or more babies in the NNU and one or more babies with them on a PNW would not be comparable with the other mothers in the study.
- mothers who would not have care of their baby following discharge from hospital for example, babies going into foster care.

Therefore all mothers of babies discharged from the NNU, who did not fulfil the exclusion criteria, were invited to participate in the RCT. It will be recalled from Chapter Three that all mothers who received standard postnatal care, who did not fulfil the exclusion criteria, were eligible to participate in the comparison study if they matched for maternal age and mothering experience with a NNU mother who had been randomly allocated to the no-intervention group (group D) of the RCT.

### **Sample size calculation**

Based on an average of the annual statistics for the NNU for 1993 and 1994 an anticipated sample size for the RCT was calculated. On average 537 babies were admitted to the NNU per annum, of whom 32 were resident outside the district and would be excluded from the study because they would have out of district primary care. Another fourteen babies had locally based parents but were transferred in from other NNUs, approximately half of whom would only have very short term care locally prior to discharge home and therefore ineligible for inclusion in the study. Babies transferred to other units for any type of care totalled 97 and 19 deaths occurred. The number of parents with active psychiatric problems and current drug or substance abuse was assessed, at that time, to be no more than 10 per year who would be ineligible for recruitment into the study. It was estimated that approximately 20% of remaining eligible mothers might decline the opportunity to participate in the study.

Therefore it was calculated that the mothers of approximately 298 babies would be available for recruitment into the RCT study over a one year period. The number of

mothers anticipated for inclusion in the comparison study would be dependent on the number allocated to the no-intervention group of the RCT.

The number of participants in each of the trial arm groups influences the power of a study to demonstrate an effect of an intervention. In this study power calculations, by the Epidemiologist in the Research Management Group, were constrained by the purely descriptive nature of previous evaluations of telephone helplines and the only reported trial of 'Baby Check' with mothers following their baby's discharge from a NNU was a short pilot study in New Zealand (Stewart et al. 1994). A further constraint was that the recruitment of mothers to the main study was restricted to one year.

#### **Recruitment of mothers to the randomised controlled trial**

The population for the RCT was recruited from the mothers of 523 babies admitted to a NNU and subsequently discharged home between the beginning of May 1995 and the end of April 1996. Of these babies, 10 were re-admissions and 24 babies died.

The mothers of 84 babies were unavailable for recruitment because they fulfilled the exclusion criteria, details are given in Appendix 9. Eighty-four (21%) of the remaining 405 mothers eligible for recruitment declined the invitation to participate in this study. Ten mothers were lost to recruitment because of sudden and unexpected changes in discharge plans or demands from the baby that mitigated against recruitment prior to discharge.

Therefore 311 eligible NNU mothers with a baby ready for discharge were given an information letter, which is shown in Appendix 10, by the project nurses or the researcher. The information letter described the aims and objectives of the study, the possible trial arm groups and the requirements of participation in the study. It was emphasised that it was not possible for them to choose an intervention or change groups following randomisation, however mothers were free to cease participation at any time if they chose to do so without detriment to the present or future medical care of their baby. Written and verbal assurance was given to mothers that all information obtained would remain confidential within the research team and anonymous to others. The information letter incorporated a written consent form.

The project nurses or the researcher revisited the mother at a previously agreed time, usually at least 24 hours after the initial contact, to obtain her decision regarding participation in the study. Following receipt of written consent, the project nurse/researcher

would arrange a mutually convenient time with the mother to conduct the data collection interview. Only after written consent was obtained from a NNU mother did the random allocation of an intervention group occur preceded by stratification by mothering experience.

### **Avoiding contamination of the trial arm groups**

To avoid contamination of the trial arm groups the neonatal staff were asked not to engage in open discussion with groups of mothers about the interventions being evaluated.

Mothers were also asked not to swap 'Baby Helpline' or 'Baby Check' information with each other. Any information passed between participating mothers, such as the 'Baby Helpline' telephone number or a copy of 'Baby Check', might have contaminated the groups and complicated interpretation of the results. The risk of contamination was further minimised by making the initial contact with mothers as close as possible to the time of discharge and there were no publicity advertisements of the study or the interventions on the NNU.

In the local community, 'Baby Check' was not routinely available from the primary care teams although it was possible that mothers could obtain a copy from another source. Awareness was raised amongst health visitors of the risks to the quality of the research if contamination of the intervention groups occurred. The health visitors agreed not to pass 'Baby Helpline' or 'Baby Check' information between mothers on their case load.

### **Recruitment of mothers to the comparison study**

Recruitment to the comparison study began in July 1995. Whenever a mother was randomly allocated to the no-intervention arm of the RCT (group D), a mother, who had received standard postnatal care, was sought for the comparison study. Eligible mothers were identified from the birth register and matched for maternal age and mothering experience. An information letter, which is shown in Appendix 11, was given to the eligible PNW mothers and described the aims and objectives of the study and the requirements of participation in the study. The information letter incorporated a written consent form and stressed mothers were free to cease participation in the study at any time if they chose to do so without detriment to the present or future medical care of themselves or their baby. Twelve PNW mothers who were invited to participate in the comparison study refused.

### **The objectives of the main study**

The objectives for the main study were:-

**objective (i) - to identify the characteristics of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

**objective (ii) – to discover if there were significant differences in the characteristics of mothers and babies within the four trial arm groups of the randomised controlled trial.**

**objective (iii) - to identify the mothers' characteristics that were associated with anxiety in mothers who had their baby discharged from a neonatal unit.**

**objective (iv) - to identify the mothers' characteristics that were associated with the change in anxiety over time of mothers who had their baby discharged from a neonatal unit.**

**objective (v) – to identify the mothers' characteristics that were associated with the mood states of mothers who had their baby discharged from a neonatal unit.**

**objective (vi) - to identify the mothers' characteristics that were associated with change in mood states over time of mothers who had their baby discharged from a neonatal unit.**

**objective (vii) – to discover the level of mood states of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers who were discharged home following standard postnatal care.**

**objective (viii) – to discover the extent of change in mood states over time of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers who were discharged home following standard postnatal care.**

**objective (x) – to determine the effect of 'Baby Helpline' and 'Baby Check' on anxiety of mothers who had their baby discharged from a neonatal unit.**

**objective (xi) – to determine the effect of ‘Baby Helpline’ and ‘Baby Check’ on the change in anxiety over time of mothers who had their baby discharged from a neonatal unit.**

**objective (xii) – to determine the effect of ‘Baby Helpline’ and ‘Baby Check’ on the mood states of mothers who had their baby discharged from a neonatal unit.**

**objective (xiii) – to determine the effect of ‘Baby Helpline’ and ‘Baby Check’ on the change in mood states over time of mothers who had their baby discharged from a neonatal unit.**

**objective (xiv) – to discover the level of anxiety of mothers who had their baby discharged from a neonatal unit, and compare this with mothers who were discharged home following standard postnatal care.**

**objective (xv) – to discover the extent of change in anxiety over time of mothers who had their baby discharged from a neonatal unit, and compare this with mothers who were discharged home following standard postnatal care.**

## **DATA COLLECTION FOR THE MAIN STUDY**

### **Data collection period**

The data collection period for the RCT and the comparison study was three months following the baby’s discharge from hospital. As recruitment of mothers continued for one year, the data collection phase of the main study therefore spanned fifteen months. During the intervention and data collection period for the RCT there was no prompting of mothers to use the interventions allocated as this would better reflect their use in a routine setting.

### **Data collection interview**

The researcher trained the project nurses to conduct the data collection interview. The purpose of the interview was to administer the structured questionnaire and the standardised inventories to measure the mothers’ anxiety and mood states and, where appropriate, discuss the allocated additional support intervention(s).

The interview took approximately thirty minutes to complete without interruption. However, this proved to be a task easier planned than achieved, as demanding babies have no respect for arrangements made between mothers and researchers!

### **Structured questionnaire**

#### **The purpose of the questionnaire**

The purpose of the questionnaire was to collect information that would establish the characteristics of mothers who participated in the study. Demographic, obstetric and paediatric information were collected from the maternal and baby medical case notes and recorded on the structured questionnaire which is shown in Appendix 12 for the NNU mothers and Appendix 13 for the PNW mothers. At the interview, the information collected was verified with the mother and omissions or errors were rectified. The questionnaire took approximately ten minutes to complete. The rationale for information sought by the questionnaire was:-

#### **Demographic information**

The mothers' name, address and post-code were required to enable future contact by post. The mothers' date of birth was recorded so that age at childbirth could be calculated and related to their anxiety and mood states as referred to in the literature (Brooten et al. 1988; Redshaw, 1997; Green and Kafetsios, 1997). Members of the primary care team who had been informed of the baby's discharge were identified to enable assessment of the support available from the primary health care team.

Domestic access to a telephone was recorded to assess the availability of telephone ownership in the study population. As described in the rationale chapter, telephone ownership in Great Britain was 91% in 1994. As stated previously, low birth weight and admission to a NNU are frequently cited as being associated with low income and social disadvantage. Since one of the support interventions evaluated was a telephone helpline it was therefore necessary to discover the incidence of telephone ownership and ease of access to a telephone for NNU mothers, half of whom were randomised to receive the telephone helpline intervention.

#### **Obstetric information**

The occurrence of previous adverse obstetric events was recorded as the literature suggested that such events might impact subsequently on the mothers' anxiety and mood

(Bakketeig and Hoffman, 1981; Hoffman and Bakketeig, 1984; Lumley, 1993; Papiernik, 1993; Meis et al. 1998; Zhou et al. 1999). Parity was recorded to cross check information on previous adverse obstetric events and previous mothering experience. Confirmation of previous mothering experience was required to check that stratification had been applied appropriately prior to the mothers' random allocation to an intervention group. The type of delivery experienced was recorded. The literature suggested that when a mother had a delivery that was different from her expectations, the potential existed for the experience to impact on her anxiety and mood states (Oakley, 1980; Sherr, 1995; Ballard et al. 1995; Tarkka and Paunonen, 1996; Wijma et al. 1997; Ryding et al. 1997; Lyons, 1998; Ryding et al. 1998).

### **Baby information**

The baby's date of birth was recorded to enable maternal age on the date of childbirth to be calculated. Recording gestation at birth and birth weight would identify premature and low birth weight babies so that any association with anxiety and mood state in mothers could be assessed as referred to in previous studies (Caplan, 1960; Kaplan and Mason, 1960; Caplan et al. 1965; Benfield et al. 1976; Gennaro, 1988; Brooten et al. 1988; Miles, 1989; McHaffie, 1990; Gennaro et al. 1990).

### **Admission and discharge information**

This section related primarily to the baby's admission and discharge from the NNU. Length of stay on the NNU could then be calculated and related to mothers' anxiety and mood states as referred to in the literature (Brooten et al. 1988).

### **Questions about 'you and your family'**

In this section, questions about present smoking, smoking during pregnancy and other household smokers were asked because of the known association with low birth weight and the incidence of respiratory tract infections and cot death as a potential source of anxiety for mothers and baby illness (Hoffman et al. 1988; Department of Health, 1996). In addition, we might expect to see a higher incidence of maternal smoking, especially during pregnancy, in the NNU mothers compared with the PNW mothers.

Marital status was recorded for comparison with the national population and other studies (Berkowitz and Kasl, 1983; Mercer et al. 1996; Nordentoft et al. 1996; Meis et al. 1998). Home tenure was a proxy measure for family financial status (Lumley, 1993; Mercer et al. 1996). Low birth weight and admission to a NNU are both associated with low income, or

more likely, the effects of low income therefore we might expect to find fewer home owners in the NNU mothers. Maternal and partner occupations were recorded to facilitate an option for social class classification. Qualifications required to undertake the job were recorded to assist with the accuracy of social class coding. Mothers' educational attainment on leaving full time education was recorded to facilitate another option for 'social standing' assessment (Oakley and Rajan, 1991).

NNU mothers were asked to rate their level of satisfaction with information received about their baby's diagnosis, investigations, progress, medicines and discharge plans. Mothers were also asked to rate their level of satisfaction with their preparation for caring for their baby at home. Significant levels of dissatisfaction felt by mothers had the potential to impact on their anxiety and mood, particularly the baseline measurements recorded around the time of their baby's discharge home.

The Parent Held Child Health Record book was a recent innovation around the time of data collection. As the record book also contained a substantial volume of health information it was essential to ascertain its distribution amongst the mothers participating in this study therefore mothers were asked if they had received their book. Unequal distribution would have advantaged some and disadvantaged others and had the potential to interact positively or negatively with the support interventions on trial.

### **Standardised inventories for anxiety and mood states**

#### **The outcome measure for anxiety**

The standardised inventory selected to measure anxiety was the Spielberger State-Trait Anxiety Inventory (STAI) (Spielberger et al. 1983) and a sample of questions is shown in Appendix 14. Anxiety refers to two different, but logically related constructs or dimensions, firstly a current unpleasant emotional condition or state of variable duration and secondly 'anxiety-proneness' as a personality trait which is relatively consistent in an individual.

The rationale for selecting the STAI as the outcome measure for anxiety in mothers following their baby's discharge from a NNU was based on its ability to measure trait and state-anxiety. The state-anxiety scale consists of twenty statements that assess how respondents '***feel right now***,' at this moment in time. The trait-anxiety scale consists of twenty statements that assess how respondents '***generally feel***'. In addition, the STAI is appropriate for use with groups or individuals and has been used by other studies with similar populations of women (Consolvo, 1986; Gennaro, 1988; Statham and Green, 1994;

Koltyn, 1994; Green and Kafetsios, 1997; Hunfeld et al. 1997; Shields-Poë and Pinelli, 1997).

### **State-anxiety**

Anxiety states exist at particular moments in time, triggered by sudden or accumulative stimuli that pose a psychological threat to the individual. Anxiety states achieve a level of intensity and, although essentially transitory by nature, endure for a variable period of time whilst the evoking conditions persist. State-anxiety is characterised by negative, subjective feelings such as of worry, nervousness, apprehension and tension. Mothers at home with a new baby have described all of these emotions (Choi, 1972; Oakley, 1979; Mercer, 1986; McHaffie, 1990; Pond and Kemp, 1992; Crouch and Manderson, 1993; McKim, 1993a; Ball, 1994). The response, intensity and duration of state-anxiety are dependent on individual perceptions of the situation and the degree of threat it represents. This study will assess the state-anxiety of mothers who had their baby discharged from a NNU and mothers who were discharged home with their baby from a PNW around the time of discharge and at three months after discharge.

### **Trait-anxiety**

In contrast, trait-anxiety refers to enduring differences in the disposition of individuals to perceive the world in a particular way and a tendency to respond, react or behave in a predictable way in given situations. Trait-anxiety influences differences within individuals to perceive situations as stressful and influences the degree of perceived threat to personal well-being and the intensity of the state-anxiety response. This study will explore the extent of differences in trait-anxiety between mothers who had their baby admitted and subsequently discharged from a NNU and mothers who received standard postnatal care and were discharged home with their baby from a PNW.

### **Correlation of trait and state-anxiety**

Generally, individuals with high trait-anxiety show increased state-anxiety more frequently than low trait-anxiety individuals as a result of their predisposition to construe a wider range of situations as threatening (Spielberger et al. 1983). Those with high trait-anxiety are also more likely to react with greater intensity of state-anxiety to situations that involve interpersonal relationships and threatened self-esteem such as mothering a baby following discharge from a NNU. The extent to which those with different trait-anxiety will demonstrate a corresponding difference in state-anxiety depends on the extent to which

the individual perceives the situation as psychologically threatening, and that is greatly influenced by past experiences and may be a predictor of future responses.

However, the individual's interpretation of the degree of threat imposed by a situation may influence state-anxiety more than any real danger attributable to the actual situation. Situations that may result in failure or make an assessment of an individual's personal adequacy, such as mothering skills, tend to be regarded as more threatening to those with a high trait-anxiety. In general terms, the correlation between state and trait-anxiety are greater in situations of social evaluation, such as mothering competency, than in situations of personal physical threat. Individuals with a high trait-anxiety do not appear to respond to physical danger differently from those with low trait-anxiety.

In this study the findings on state-anxiety will be presented with and without being adjusted for trait-anxiety. In other studies of new mothers that reported trait-anxiety, the findings were not related to the state-anxiety also reported (Statham and Green, 1994; Green and Kafetsios, 1997).

### **Limitations to measuring anxiety**

The limitations of tests such as the STAI and others to accurately measure anxiety are acknowledged. Approximately half of the statements on the STAI refer to negative characteristics, such as feeling frightened, confused or a failure. Inevitably some mothers might be reluctant to admit to such negative feelings if they regard them as undesirable characteristics or a sign of personal weakness. In addition, some mothers might aspire to 'look good' to the health professionals and respond more positively than they actually feel to anxiety-absent questions, such as feeling self-confident or calm.

### **Administration of the Spielberger State-Trait Anxiety Inventory**

It is recommended in the STAI administration manual that the inventory be presented as a 'self-evaluation questionnaire' rather than a measure of 'anxiety' to avoid influencing responses (Spielberger et al. 1983). The STAI is not time limited, but generally takes approximately ten minutes to complete both assessment forms.

At the initial time point measurement, around the time of discharge from hospital, the state-anxiety scale was administered prior to the trait-anxiety scale. The trait-anxiety scale is 'relatively impervious' to the emotional conditions under which it is administered however, the state-anxiety scale is intentionally susceptible to the prevailing emotional conditions

and could be affected by earlier completion of the trait-anxiety scale (Spielberger et al. 1983).

To complete the state-anxiety scale, mothers were asked to circle the number along side each of the twenty statements which best described the **intensity** of their **feelings right now** on a four point scale: 1 = not at all; 2 = somewhat; 3 = moderately so; 4 = very much so.

The trait-anxiety scale was completed by circling the number along side each of the twenty statements which most closely represented the **frequency** of how they **generally feel** using another four point scale: 1 = almost never; 2 = sometimes; 3 = often; 4 = almost always.

The state-anxiety questionnaire was repeated three months following the baby's discharge from hospital. A questionnaire was sent to the mothers by post with full instructions on how to complete and return the questionnaire in the postage paid envelope provided.

### **Scoring the Spielberger State-Trait Anxiety Inventory**

The scores for the trait and state-anxiety scales range from a minimum of 20 to a maximum of 80, with a higher score indicating a greater degree of anxiety. As recommended in the manual for the STAI, for mothers who omitted one or two questions from the scale, an average score was achieved by calculating the mean weighted score of the questions answered, then multiplying that value by 20 and rounding up to the next whole number. If three or more questions were omitted the form was declared invalid and regarded as missing (Spielberger et al. 1983).

### **The outcome measure for mood**

The standardised inventory selected to measure mood was the Profile of Mood States-Bipolar Form (POMS-Bi) (Lorr and McNair, 1988) and a sample of questions is shown in Appendix 15. The rationale for selecting the POMS-Bi as the outcome measure for mood with mothers following their baby's discharge from a NNU was based on its ability to measure both positive and negative dimensions of mood states and its suitability for use with individuals or groups. In addition, the POMS-Bi had been used in other studies with similar populations of women (Affleck et al. 1990a; Affleck et al. 1990b; Koltyn, 1994) and there are normative data for British adults. The British normative data or normal values for

the POMS-Bi were established through tests, re-tests and follow up tests several months later on a sample of 416 male and female British adults (Bartram et al. 1991).

### **Six mood states**

The POMS-Bi measures six mood state dimensions. Twelve adjectives define each mood state, six of which characterise the positive dimension and six characterise the negative dimension of each mood state. The mood state dimensions are composed-anxious, agreeable-hostile, elated-depressed, confident-unsure, energetic-tired and clear headed-confused. Reliability studies have indicated that the 12 adjectives per mood state (six positive and six negative) were 'sufficient to achieve a satisfactory level of internal consistency' (Lorr and McNair, 1988).

### **Limitations to measuring mood**

Mood and feeling states are frequently measured using adjective checklists or rating scales, however most measure monopolar mood states, depression or 'general health status' (Snaith et al. 1976; Hunt et al. 1981; Cox et al. 1987). A problem identified early in the development of adjective lists and rating scales for measuring mood and social science research in general was that of subject acquiescence and extreme bias responses (Robson, 1993). However, the POMS-Bi is controlled for subject acquiescence and bias through a balanced rating scale and its scoring system.

### **Administration of the Profile of Mood States-Bi-Polar Form**

The mothers were asked to mark the number opposite the adjective or phrase that most closely represented how they have felt '***during the last week, including today***'. The rating scale for their answers was 3 = much like this; 2 = slightly like this; 1 = slightly unlike this and 0 = much unlike this. Mothers were reassured that there were no right or wrong answers. Administration of the POMS-Bi is not time limited and is usually completed in approximately ten minutes.

The POMS-Bi assessment was repeated at one, two and three months following the baby's discharge home. The POMS-Bi assessment form was inserted into the Health Diary at 28-day intervals. Mothers were asked to complete the form on the appropriate day when it appeared in the Health Diary even if some of the diary entries had been omitted. For ease of identification within the Health Diary, the POMS-Bi assessment forms were colour co-ordinated with the Health Diary cover (a different colour for each trial arm group).

At the end of the three months intervention/data collection period a large postage paid envelope was sent to each mother for the return of the Health Diary including the POMS-Bi assessments. As stated earlier, the report of the methods, analysis and findings from the Health Diary does not form part of this thesis.

### **Scoring the Profile of Mood States-Bi-Polar Form**

As stated earlier, the POMS-Bi questionnaire measures six negative and six positive mood dimensions. The scores on the six positive sub-scales range from 0 to 18 and the six negative sub-scales scores range from 0 to -18. The final score is calculated by the sum of the two sub-scale scores and adding 18. The final scores therefore ranged from 0 to 36 with lower scores representing more negative mood states.

### **STATISTICAL METHODS USED IN THE MAIN STUDY**

Statistical analysis was mainly undertaken using the Statistical Package for Social Science (SPSS for windows version 8.0) with some minor use of Epi Info (version 5). Where data were normally distributed the mean and standard deviation were stated and for skewed data the median and interquartile range (IQR) were given. Statistical significance was attributed to *p*-values of 0.05 or less, that is a probability level of 5% or less. All *p*-values reported were two-sided which indicated the probability of a difference in either direction. The significance of differences between groups were derived by using Chi-square tests. Pearson's Chi-square test was used if all cells had an expected cell count of five or greater. When the expected cell count was less than five in a 2x2 table the Fisher's Exact test was used. To test for the equality of mean scores between groups the Student's *t*-test was used.

An extension of the *t*-test was used called analysis of variance (ANOVA) for comparing the variability of means between two or more groups where data were normally distributed. The significance of the difference between the groups was expressed as a *p*-value.

Univariate analysis was used to consider the effect of individual variables on the data. Multivariate models were established to examine the interrelationship and effect of several variables on the data.

Although the POMS-Bi scale lengths of the six mood states were the same, their values were not comparable. Therefore a common unit of measurement was required. For the

analysis of the POMS-Bi data, the raw scores were converted into T-scores which enabled the six mood scores to be comparable with each other. Conversion to T-scores gave each scale a mean of 50 and a standard deviation of 10.

A simple regression model was used to describe the linear relationship between two continuous variables where, for example POMS-Bi T-score (y) would be the dependent or response variable and gestation at birth (x) would be the independent or predictor variable.

Correlations were used to demonstrate the strength of the relationship between the six mood dimensions of the POMS-Bi, and trait and state-anxiety, and state-anxiety at two time points. In addition, strength of the relationship between the STAI inventory and the POMS-Bi inventory was demonstrated.

## **SYNOPSIS OF CHAPTER SIX**

This chapter has described the methods used to collect data for the factorial stratified blocked RCT and the second part of the comparison study that formed the two components of the main study of this thesis.

The purpose of the RCT was to evaluate the effect of 'Baby Helpline' and 'Baby Check' on the anxiety and mood states of mothers who had their baby discharged from a neonatal unit. In addition, the characteristics of NNU mothers that were associated with their anxiety and mood were also identified.

The purpose of the comparison study was to discover the extent of differences between the characteristics, anxiety and mood states of mothers who had had their baby discharged from a NNU and mothers who had standard postnatal care and were discharged home with their baby from a PNW. In this part of the study, neither group of mothers received any additional support interventions.

The data collection tools used were a structured questionnaire and standardised inventories to measure anxiety and mood. The structured questionnaire was used to collect demographic, obstetric, paediatric and social information about mothers and their baby. The Spielberger State-Trait Anxiety Inventory measured the outcome of anxiety and the outcome of mood was measured by the Profile of Mood States Bi-Polar Form.

The recruitment of mothers and data collection methods were described in detail. The data collection and, where appropriate, the intervention period for each mother was three months following their baby's discharge home. Therefore the data collection phase of the main study spanned fifteen months. The statistical methods used in the analysis of the main study were also described.

The findings from the main study are presented in the following chapters.

## **CHAPTER SEVEN**

### **MAIN STUDY FINDINGS**

### **CHARACTERISTICS OF MOTHERS AND BABIES**

#### **THE AIM OF THIS CHAPTER**

The aim of this chapter is to present the findings of the investigation into the characteristics of the mothers and their babies who participated in the randomised controlled trial (RCT) and the comparison study (part 2). The aims of this investigation were:-

- to describe the extent of the differences in the characteristics of the mothers who had their baby discharged from a NNU and mothers who received standard postnatal care and took their baby home from a PNW. We will recall that in the comparison study (part 2) the PNW mothers were matched with the NNU mothers by age and previous mothering experience.
- to ascertain if the random allocation of mothers to the trial arm groups of the RCT had been effective in establishing an equal distribution of mother and baby characteristics across the four groups, which is important in relation to the interpretation of the evaluation of the support interventions. If the mothers in each of the trial arm groups are as similar as possible, any differences detected in their anxiety or mood are therefore more likely to be due to an effect of the support interventions rather than a difference in the mothers. We will recall that the mothers were randomly allocated to the trial arm groups following stratification for 'mothering experience' only.

#### **Objectives of the investigation into the characteristics of mothers and babies**

The objectives addressed by these findings are:-

**objective (i) - to identify the characteristics of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

**objective (ii) – to discover if there were significant differences in the characteristics of mothers and babies within the four trial arm groups of the randomised controlled trial.**

For clarity and ease of presentation the characteristics of the babies will be presented first followed by the characteristics of the mothers.

**Characteristics of the babies**

The characteristics of babies born to the NNU mothers and the PNW mothers are shown in table 20.

**Key for table 20 (on next page)**

NNU	= Neonatal Unit mother
PNW	= Postnatal Ward mother
MNNU	= NNU mothers matched with PNW mother for maternal age and mothering experience
Group A	= 'Baby Helpline' and 'Baby Check'
Group B	= 'Baby Helpline'
Group C	= 'Baby Check'
Group D	= No intervention
<sup>a</sup>	= <i>p</i> -value derived from analysis of variance of continuous variable
n/a	= not applicable

Table 20 Characteristics of babies (n=341) (Key for table 20 on previous page)

Characteristics	Total NNU Group n=287 (%)	NNU Group A n = 71 (%)	NNU Group B n = 72 (%)	NNU Group C n = 72 (%)	NNU Group D also MNNU n = 72 (%)	NNU Group n=54 (%)	Difference between groups	
							Groups A - D p-value	MNNU - PNW p-value
Birth weight (BW) Kg - mean (sd)	2.620 (0.985)	2.610 (1.117)	2.602 (0.907)	2.606 (0.956)	2.661 (0.970)	3.407 (0.437)	0.98 <sup>a</sup>	<0.001 <sup>a</sup>
Gestation - weeks								
24 - 29	22 (8)	8 (11)	6 (8)	4 (6)	4 (6)	0.80		<0.001
30 - 33	60 (21)	17 (24)	12 (17)	16 (22)	15 (21)	0		
34 - 37	91 (32)	17 (24)	29 (40)	22 (31)	23 (32)	0		
38 - 39	47 (16)	13 (18)	8 (11)	13 (18)	13 (18)	6 (11)		
40 +	67 (23)	16 (23)	17 (24)	17 (24)	17 (24)	12 (22)		
Birth at 32 or less weeks gestation &/or BW 1.5Kg or less -No -Yes	219 (76) 68 (24)	50 (70) 21 (30)	56 (78) 16 (22)	56 (78) 16 (22)	57 (79) 15 (21)	36 (68)		0.60
Length of stay-days								
0 - 1	55 (19)	16 (23)	9 (13)	13 (18)	17 (24)	n/a		0.45
2 - 7	90 (31)	17(24)	27 (38)	24 (33)	22 (31)	n/a		
8 - 14	33 (12)	8 (11)	10 (14)	10 (14)	5 (7)	n/a		
15 - 28	53 (19)	15 (21)	14 (19)	9 (13)	15 (21)	n/a		
29 - 56	32 (11)	5 (7)	8 (11)	11 (15)	8 (11)	n/a		
57 +	24 (8)	10 (14)	4 (6)	5 (7)	5 (7)	n/a		
Discharge weight Kg - mean (sd)	2.879 (0.759)	3.018 (0.811)	2.777 (0.715)	2.847 (0.762)	2.875 (0.743)	n/a	0.28 <sup>a</sup>	

Table 20 shows:-

**Birth weight**

**Comparison study**

There was a significant difference between the matched neonatal unit (MNNU) and postnatal ward (PNW) groups for birth weight ( $p<0.001$ ). The mean birth weight for the MNNU group was 2.661Kg (sd 0.970Kg) and for the PNW group 3.407Kg (sd 0.437Kg).

**Randomised controlled trial**

The mean birth weight for the babies born to the neonatal unit (NNU) mothers was 2.620Kg (sd 0.985Kg) with no significant difference demonstrated across the four trial arm groups ( $p=0.98$ ). Therefore birth weight was similar across all four trial arm groups.

**Gestation at birth**

**Comparison study**

There was also a significant difference between the MNNU and the PNW groups for gestation at birth. The MNNU mothers delivered earlier babies than the PNW mothers ( $p<0.001$ ). The median gestation for the MNNU group babies was 36.5 weeks (IQR 33-39 weeks) and the median gestation for the PNW group was 40 weeks (IQR 39-40 weeks).

Only babies born before 35 weeks of gestation were automatically admitted to the NNU based on their gestation at birth alone. It was therefore possible for some premature babies (between 35-37 completed weeks of gestation) to avoid admission to a NNU and be with their mother on a PNW. However, only six (11%) babies were born before 37 weeks of gestation to the PNW mothers compared with 30 (42%) term babies born to MNNU mothers.

**Randomised controlled trial**

The median gestation at birth of babies born to NNU mothers was 36 weeks (IQR 33-39 weeks). There was no significant difference in the gestation at birth of the babies in the four trial arm groups ( $p=0.80$ ). Premature birth (birth before 37 completed weeks of gestation) accounted for 173 (60%) babies and 114 (40%) babies born to NNU mothers were born at term.

## **Birth at 32 or less weeks gestation and/or 1.5Kg or less birth weight**

### ***Comparison study***

This category was not applicable to babies born to the PNW mothers. All babies in this gestation/weight category would be admitted to a NNU because of their known medical and nursing care needs.

### ***Randomised controlled trial***

There were no significant differences between the trial arm groups for the NNU mothers who delivered their baby at 32 or less weeks gestation and/or 1.5Kg or less birth weight ( $p=0.60$ ).

## **Length of stay on the Neonatal Unit**

### ***Comparison study***

This category was not applicable to babies born to PNW mothers. However, for the purposes of comparison, the usual length of stay in a PNW for mothers and babies at the time of the study was 2-3 days following a normal or instrumental delivery and 5-7 days following a Caesarean section.

### ***Randomised controlled trial***

The median length of stay for babies in the NNU was 7 days (IQR 2-23 days). Fifty-five babies (19%) were admitted for only one day and for fifty-six babies (20%) their duration of stay was for more than one month following birth. There was no significant difference in the length of stay for babies across the four trial arm groups ( $p=0.45$ ).

## **Discharge weight**

### ***Comparison study***

This category was not applicable to babies born to PNW mothers. All babies lose weight post delivery and are not expected to regain their birth weight until at least ten days after delivery. Discharge weight was therefore not recorded for the babies of the PNW mothers as they were discharged home before ten days of age. However, the babies of the MNNU mothers were significantly lighter at birth than the babies of the PNW mothers and were also likely to be lighter at the time of their discharge home.

***Randomised controlled trial***

The mean discharge weight for the babies born to the NNU mothers was 2.879Kg (sd 0.759 Kg). There were no significant differences in the discharge weight of babies across the four trial arm groups ( $p=0.28$ ).

**Characteristics of the mothers**

We will now turn our attention to the characteristics of the mothers. Table 21 shows the characteristics of mothers who had their baby discharged home from the NNU and mothers who received standard postnatal care and were discharged home their baby from a PNW.

**Key for table 21 (on next page)**

NNU	= Neonatal Unit mother
PNW	= Postnatal Ward mother
MNNU	= NNU mothers matched with PNW mothers for maternal age and mothering experience
Group A	= 'Baby Helpline' and 'Baby Check'
Group B	= 'Baby Helpline'
Group C	= 'Baby Check'
Group D	= No intervention
a	= $p$ -value derived from analysis of variance of continuous variable
b	= $p$ -value derived from married/lived with partner versus other groups combined
c	= data missing for 1 mother
d	= data missing for 2 mothers
e	= data missing for 3 mothers
C. section	= Caesarean section
general	= general anaesthetic
epidural	= epidural anaesthetic
H.A.	= Housing Association

**Table 21 Characteristics of mothers (n=341) (Key for table 21 previous page)**

Characteristics	Total NNU Group n=287 (%)	NNU Group A n = 71 (%)	NNU Group B n = 72 (%)	NNU Group C n = 72 (%)	NNU Group D also MNNU n= 72 (%)	NNU Group E also MNNU n=54 (%)	PNW Group	Difference between groups	
								Groups A - D	MNNU - PNW p-value
<b>Maternal age years - mean (sd)</b>	28.5 (5.5)	28.8 (5.6)	27.8 (5.7)	29.0 (5.1)	28.2 (5.7)	29.1 (5.4)		0.54 <sup>a</sup>	0.37 <sup>a</sup>
<b>Qualifications</b>									
None	29 (10)	9 (13)	9 (13)	5 (7)	6 (8)	6 (7)		0.42	0.24
GCSE/O Level	111 (39)	26 (37)	29 (40)	26 (36)	30 (42)	30 (42)			
A Level	31 (11)	9 (13)	8 (11)	10 (14)	4 (6)	4 (6)			
Higher Ed/degree	40 (14)	7 (10)	13 (18)	8 (11)	12 (17)	8 (15)			
Vocational	27 (9)	7 (10)	3 (4)	6 (8)	11 (15)	6 (11)			
Other	49 (17)	13 (18)	10 (14)	17 (24)	9 (13)	6 (11)			
<b>Marital status</b>									
Married/lived with partner	248 (86)	62 (87)	63 (86)	64 (89)	59 (82)	51 (94)		0.63 <sup>b</sup>	0.04 <sup>b</sup>
Single	20 (7)	8 (11)	4 (6)	3 (4)	5 (7)	2 (4)			
Single lived with parents	12 (4)	1 (1)	4 (6)	3 (4)	4 (6)	1 (2)			
Other	7 (2)	(0)	1 (1)	2 (2)	4 (6)	(0)			
<b>Adverse obstetric history</b>									
-No event	162 (56)	40 (56)	39 (54)	43 (60)	40 (56)	39 (72)			
-Any event	125 (44)	31 (44)	33 (46)	29 (40)	32 (44)	15 (28)			
<b>Experienced mother</b>	-No	160 (56)	40 (56)	40 (56)	40 (56)	31 (57)			
-Yes	127 (44)	32 (44)	32 (44)	32 (44)	32 (44)	23 (43)			
<b>Delivery type</b>									
C. section - general	56 (20)	6 (9)	14 (19)	20 (28)	16 (22)	2 (4)		0.22	0.02
C. section - epidural	79 (28)	24 (34)	20 (28)	18 (25)	17 (24)	15 (28)			
Forceps - Ventouse	35 (12)	11 (16)	8 (11)	5 (7)	11 (15)	7 (13)			
Normal vaginal	117 (41)	30 (42)	30 (42)	29 (40)	28 (39)	30 (56)			

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Table 21 Characteristics of mothers (n=341) continued

Characteristics	Total NNU Group n=287 (%)	NNU Group A n = 71 (%)	NNU Group B n = 72 (%)	NNU Group C n = 72 (%)	NNU Group D also MNNU n = 72 (%)	PNW Group n=54 (%)	Difference between groups	
							Groups A - D p-value	MNNU - PNW p-value
<b>Smoke exposure</b>								
Cigarette smoker	76 (27)	17 (24)	22 (31) <sup>c</sup>	18 (25)	19 (27) <sup>d</sup>	11(20)	0.58	0.32
Smoked in pregnancy	71 (25)	18 (25)	19 (26) <sup>c</sup>	18 (25)	16 (23) <sup>d</sup>	12 (22)	0.68	0.47
Other household smokers	105 (37)	25 (35)	25 (35) <sup>c</sup>	34 (47)	21 (30) <sup>e</sup>	21 (39)	0.10	0.20
<b>Home tenure</b>								
Home owner	180 (63)	45 (63)	39 (54)	49 (68)	47 (65)	43 (80)	0.52	0.17
Rent-Local Authority/H. A.	61 (21)	15 (21)	19 (26)	12 (17)	15 (21)	9 (17)		
Rent-private/employment	40 (14)	9 (13)	13 (18)	11 (15)	7 (10)	2 (4)		
Other	6 (2)	2 (3)	1 (1)	0	3 (4)	0		
<b>Access to telephone</b>								
Telephone in own home	268 (93)	67 (94)	69 (96)	66 (92)	66 (92)	49 (91)	0.68	1.00

Table 21 shows:-

### **Age**

#### ***Comparison study***

The effectiveness of matching the MNNU mothers and PNW mothers by age was confirmed as there were no significant difference between the MNNU and PNW mothers ( $p=0.37$ ).

The mean age was 29.1 years (sd 5.4 years) for the PNW mothers and 28.2 years (sd 5.7 years) for the MNNU mothers.

#### ***Randomised controlled trial***

The mean age of the MNNU mothers was 28.5 years (sd 5.5 years) which was not significantly different between the four trial arm groups ( $p=0.54$ ).

### **Qualifications**

#### ***Comparison study***

There was no significant difference in the educational attainment on leaving full time education between the MNNU mothers and PNW mothers ( $p=0.24$ ). Only 8% of MNNU and 7% of PNW mothers had no qualifications. Forty-two per cent MNNU and 28% PNW mothers achieved GCSE/O-Levels, 6% MNNU and 15% PNW mothers gained A-Levels and 17% MNNU and 28% PNW mothers completed their education with a higher education diploma or degree, the remainder in both groups had vocational or other qualifications.

#### ***Randomised controlled trial***

There was no significant difference across the four trial arm groups for educational attainment on leaving full time education ( $p=0.42$ ). Overall the educational attainment for MNNU mothers showed 10% of mothers completed full time education with no qualifications, 39% achieved GCSE/O-Levels, 11% gained A-Levels and 14% completed their education with a higher education diploma or degree, and the remainder (26%) had vocational or other qualifications.

### **Marital status**

#### ***Comparison study***

The majority of MNNU mothers (82%) and PNW mothers (94%) were married or lived with their partner. However, as many as 18% of MNNU mothers were single, separated, widowed, divorced or single and lived with their parents compared with only 6% of PNW

mothers. There was therefore a significant difference between the two groups for mothers who were married or lived with their partner and the other mothers combined ( $p=0.04$ ).

**Randomised controlled trial**

There was no significant difference across the four trial arm groups between those who were married or lived with their partner and the other mothers combined ( $p=0.63$ ). In total, although in the majority, only 86% (248) of NNU mothers were married or lived with their partner. Nine per cent (27) of women were single, separated, widowed or divorced mothers and another 4% (12) of mothers were single but lived with parents.

**Adverse obstetric history**

**Comparison study**

There was no significant difference between the PNW mothers and MNNU mothers who had experienced previous adverse obstetric events combined ( $p=0.06$ ). However, because the difference was nearly significant, obstetric history was looked at in more detail. The number of mothers who had previously experienced individual adverse obstetric events was also examined and the results are shown in table 22.

**Table 22 Previous adverse obstetric events by group (n=126)**

Previous obstetric event	Matched neonatal unit mothers n=72		Postnatal ward mothers n=54		Difference between groups <i>p</i> -value
<b>Infertility</b>	7	10%	6	11%	0.80
<b>Miscarriage</b>	19	26%	11	20%	0.43
<b>Ectopic pregnancy</b>	1	1%	0	0	1.00 <sup>a</sup>
<b>Termination of pregnancy</b>	12	17%	1	2%	0.007
<b>Stillbirth/neonatal/infant death</b>	6	8%	0	0	0.04

<sup>a</sup> = Fisher's Exact test

Table 22 shows the number of mothers who had previously experienced individual adverse obstetric events for the MNNU mothers and the PNW mothers. Previous adverse obstetric events were not mutually exclusive therefore some mothers experienced more than one event. Investigations or treatment for infertility and previous miscarriage were experienced by a similar number of mothers in both groups. However, the number who had experienced previous termination of pregnancy was significantly greater for MNNU mothers than the PNW mothers ( $p=0.007$ ). Previous baby death was only experienced by MNNU mothers and was therefore significantly different from the PNW mothers ( $p=0.04$ ).

***Randomised controlled trial***

Across the four trial arms of the NNU mothers there was no significant difference for previous adverse obstetric history ( $p=0.92$ ). However, NNU mothers who previously had a termination of pregnancy were more likely to have this baby born premature ( $p=0.05$ ) and/or of low birth weight ( $p=0.03$ ). More specifically, with a history of previous termination of pregnancy this baby was more likely to be born at 32 or less weeks of gestation and/or 1.5Kg or less birth weight ( $p=0.02$ ). There was no such association for any other previous adverse obstetric event such as miscarriage or ectopic pregnancy.

**Mothering experience**

***Comparison study***

The effectiveness of the matching process was confirmed by there being no significant difference between the MNNU mothers and the PNW mothers for mothering experience ( $p=0.84$ ). For 56% of MNNU and 57% of PNW mothers this was their first mothering experience.

***Randomised controlled trial***

The effectiveness of the stratification by mothering experience was confirmed by there being no significant difference across the four trial arm groups of NNU mothers ( $p=1.00$ ). For 56% of mothers in each of the trial arm groups this was their first mothering experience.

**Delivery type**

***Comparison study***

There was a significant difference between the PNW mothers and the MNNU mothers for type of delivery ( $p=0.02$ ). The MNNU mothers experienced more births by Caesarean section and fewer normal deliveries than the PNW mothers.

Forty-six per cent (33) of MNNU mothers delivered their baby by Caesarean section, 16 under general anaesthetic and 17 under epidural anaesthetic compared with 32% (17) of PNW mothers who had a Caesarean section, two under general anaesthetic and 15 under epidural anaesthetic. Similar proportions of the MNNU mothers (15%) and PNW mothers (13%) had forceps/Ventouse deliveries. However, only 39% of MNNU mothers had a normal vaginal delivery compared with 56% of the PNW mothers.

As Caesarean section is usually undertaken when the health of the mother or baby might be compromised by a delay in delivery or the effort of a normal delivery we would therefore expect the Caesarean section rate to be higher in the NNU mothers than the PNW mothers. However, a relatively high percentage of PNW mothers were delivered by Caesarean section and this finding was unexpected.

To further explore this unexpected finding, a comparison was made between the delivery types for the PNW mothers and the hospital delivery rates between May 1995 and April 1996 (the recruitment period for this study). The purpose of this comparison was to assess how representative the PNW mothers were of the hospital births profile in terms of delivery type. Table 23 shows the percentage of mothers undergoing each type of delivery for the PNW mothers and all live births within the hospital.

**Table 23 Comparison of delivery types for all hospital live births and the postnatal ward mothers (n=4813)**

Type of delivery	Total hospital live births n=4813	Postnatal ward mothers n=54	Difference between postnatal ward mothers & total hospital live births
<b>Caesarean section</b>	18%	32%	<i>p=0.01</i>
<b>Forceps/Ventouse</b>	13%	13%	<i>p=0.94</i>
<b>Normal delivery</b>	68%	56%	<i>p=0.02</i>

Table 23 shows the comparison of delivery types for all hospital live births and the PNW mothers, the difference between the groups was derived from chi-squared calculations from three 2x2 tables. The difference between the frequency of Caesarean section in the PNW mothers and the hospital rate was significant (*p=0.01*). Only 18% of all hospital live birth deliveries were by Caesarean section compared with 32% in the PNW mothers. This probably reflected the longer stay in hospital of post Caesarean section mothers, compared with mothers who had a normal delivery, and as a consequence their greater availability for recruitment into the study.

There was no significant difference between the PNW mothers and the total hospital live births for the incidence of forceps or Ventouse deliveries (*p=0.94*). However, during the same time period, 68% of all hospital live births were normal deliveries compared with 56% of the PNW mothers who had a normal delivery. This difference was significant (*p=0.02*) with normal deliveries being under represented in the PNW mothers.

Therefore, in terms of delivery type, the PNW mothers were only partially representative of the total live birth deliveries within the hospital. A greater proportion of PNW mothers delivered their baby by Caesarean section and a smaller proportion had normal deliveries than women in general during the same time period in the hospital.

***Randomised controlled trial***

There was no significant difference in the delivery type between the four trial arm groups of NNU mothers ( $p=0.22$ ). The majority of mothers in each group had their baby delivered by Caesarean section. In total, 56 (20%) had their Caesarean section under general anaesthetic and 79 (28%) under epidural anaesthetic, 35 (12%) mothers were delivered by forceps/Ventouse and 114 (41%) mothers had normal vaginal deliveries.

**Cigarette smoking**

***Comparison study***

There was no significant difference between the 27% of MNNU mothers and the 20% of PNW mothers who reported they smoked cigarettes ( $p=0.32$ ). There was also no significant difference between the MNNU mothers (23%) and the PNW mothers (22%) who smoked during their pregnancy ( $p=0.47$ ). Regardless of the mothers' smoking habit, there were other household smokers in the homes of 30% of the MNNU mothers and 39% of PNW mothers but there was no significant difference between the two groups ( $p=0.2$ ).

***Randomised controlled trial***

For the NNU mothers 27% smoked, 25% continued to smoke during their pregnancy and 37% lived with other household smokers. There were no significant differences across the four trial arm groups of NNU mothers who smoked ( $p=0.58$ ), smoked during pregnancy ( $p=0.68$ ) or those who lived in households with smokers ( $p=0.10$ ).

**Home tenure**

***Comparison study***

Even though a greater proportion of PNW mothers compared with the MNNU mothers owned their own homes, in terms of overall home tenure a chi-squared test showed there were no significant differences between the MNNU mothers and the PNW mothers ( $p=0.17$ ). For the PNW mothers, 80% owned their own home with or without a mortgage, 17% rented from the local authority or housing association and 4% rented their home privately or as part of their employment. For the MNNU mothers, 65% owned their own home with or without a mortgage, 21% rented from the local authority or housing

association, 10% rented their home privately or as part of their employment and 4% had other styles of accommodation.

***Randomised controlled trial***

There was no significant difference for home tenure across the four trial arm groups of NNU mothers ( $p=0.52$ ). Sixty-three percent of NNU mothers owned their own home with or without a mortgage, 21% rented from the local authority or a housing association and 14% rented from a private landlord or as an integral part of their employment. Six mothers had other styles of home tenure.

**Telephone access**

***Comparison study***

There was no significant difference between the MNNU mothers and PNW mothers for domestic access to a telephone ( $p=1.00$ ). The majority of MNNU mothers (92%) and PNW mothers (91%) had access to a telephone in their own home.

***Randomised controlled trial***

There was no significant difference between the trial arm groups of NNU mothers for access to a telephone ( $p=0.68$ ). The majority of mothers (93%) had access to a telephone within their own home.

**Satisfaction with information received from the Neonatal Unit**

***Randomised controlled trial***

Reported satisfaction with aspects of their care on the NNU were explored to discover if expressed levels of satisfaction and dissatisfaction were equally distributed across the four trial arm groups of NNU mothers. High levels of dissatisfaction with information received or discharge preparation might impact on the anxiety and mood states of mothers following their baby's discharge home.

Around the time of their baby's discharge home, the majority of NNU mothers described themselves as being 'generally satisfied' or 'very satisfied' with information received about their baby's diagnosis (97%), investigations (90%), medicines (94%) and progress (98%). Chi-squared tests showed that there were no significant differences across the four trial arm groups in the level of satisfaction in relation to information received about their baby's diagnosis ( $p=0.70$ ), investigations ( $p=0.29$ ), medicines ( $p=0.10$ ) and progress ( $p=0.80$ ).

## **Satisfaction with preparation for taking baby home from the Neonatal Unit and the discharge plan**

### ***Randomised controlled trial***

Around the time of their baby's discharge home, the majority of NNU mothers were 'generally satisfied' or 'very satisfied' with the preparation they had received for taking their baby home (97%) and the discharge plan (94%). Chi-squared tests showed there were no significant differences across the four trial arm groups of the NNU mothers in the level of satisfaction expressed in relation to their preparation for discharge home ( $p=0.84$ ) or the discharge plan ( $p=0.59$ ).

### **Summary of the characteristics of mothers and babies**

These findings fulfilled **objective (i) - to identify the characteristics of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

The findings were:-

- there were no significant differences between the MNNU mothers and the PNW mothers for educational attainment on leaving full time education ( $p=0.24$ ), adverse obstetric history ( $p=0.06$ ), smoking ( $p=0.32$ ), smoked during pregnancy ( $p=0.47$ ), other household smokers ( $p=0.20$ ), home tenure ( $p=0.17$ ) and access to a telephone ( $p=1.00$ ).
- significantly fewer MNNU mothers were married or lived with their partner compared with being single, separated or divorced than the PNW mothers ( $p=0.04$ ). The MNNU mothers also gave birth to smaller ( $p<0.001$ ) and earlier ( $p<0.001$ ) babies and had significantly more births by Caesarean section ( $p=0.02$ ) and fewer normal deliveries than the PNW mothers. When adverse obstetric history was looked at in detail, more matched neonatal unit mothers had previously had a termination of pregnancy ( $p=0.007$ ) or a baby death ( $p=0.04$ ) than the PNW mothers.

Therefore we can conclude that there were few unexpected significant differences between mothers who had their baby discharged from a neonatal unit and mothers who received standard postnatal care and were discharged home with their baby from a PNW, however past and present obstetric factors appeared to be more discriminating than social factors.

The findings of the RCT fulfilled **objective (ii)** – to discover if there were significant differences in the characteristics of mothers and babies within the four trial arm groups of the randomised controlled trial.

The findings showed:-

- the process of stratification by mothering experience was effective and there was no significant difference detected across the four trial arm groups of neonatal unit mothers ( $p=1.00$ ).
- the randomisation process was effective for characteristics that were neither stratified nor matched. There were no significant differences found between the four trial arm groups of neonatal unit mothers for age ( $p=0.54$ ), educational attainment on leaving full time education ( $p=0.42$ ), marital status ( $p=0.63$ ), adverse obstetric history ( $p=0.92$ ), delivery type ( $p=0.22$ ), cigarette smoking ( $p=0.58$ ), smoked during pregnancy ( $p=0.68$ ), other household smokers ( $p=0.10$ ), home tenure ( $p=0.52$ ), access to a telephone ( $p=0.68$ ), birth weight ( $p=0.98$ ), gestation age at birth ( $p=0.80$ ), birth at less than 32 weeks gestation and/or 1.5Kg or less birth weight ( $p=0.60$ ), length of stay in the Neonatal Unit ( $p=0.45$ ) or discharge weight ( $p=0.28$ ).
- there were no significant differences across the four trial arm groups for mothers' expression of satisfaction with information received about their baby's diagnosis ( $p=0.70$ ), investigations ( $p=0.29$ ), medicines ( $p=0.10$ ) or progress ( $p=0.80$ ).
- there were also no significant differences across the four trial arm groups of neonatal unit mothers who expressed satisfaction with the preparation they received for taking their baby home ( $p=0.84$ ) or their discharge plan ( $p=0.59$ ).
- Therefore we can conclude that the characteristics and experiences of neonatal care for the mothers were equally similar across the four trial arm groups, which confirmed a level baseline from which the support interventions could be evaluated.

## **SYNOPSIS OF CHAPTER SEVEN**

This chapter has presented the findings on the characteristics of the mothers who participated in the main study.

In relation to the comparison of mothers who had their baby discharged from a NNU and mothers who were discharged home with their baby from a PNW, the extent of differences in their characteristics were found to be few. However, past and present obstetric factors appeared to be more discriminating than social factors.

In relation to the RCT, the processes of stratification and randomisation of the NNU mothers to the trial arm groups ensured that their characteristics were equal across the four trial arm groups. Equality of characteristics across the trial arm groups minimises the risk, as far as possible, that the mothers' characteristics do not influence the outcome of the evaluation of the support interventions.

The following chapter will present the findings on the extent of differences in anxiety in mothers who had their baby discharged from a NNU and mothers who were discharged home with their baby from a PNW for the comparison study (part 2). In relation to the RCT, the following chapter will present the evaluation of the effect of the support interventions on the anxiety of mothers who had their baby discharged from a NNU.

## **CHAPTER EIGHT**

### **MAIN STUDY FINDINGS** **ANXIETY IN MOTHERS**

#### **THE AIM OF THIS CHAPTER**

The aim of this chapter is to present the findings on anxiety in mothers in relation to the randomised controlled trial (RCT) and the comparison study (part 2). The Spielberger State-Trait Anxiety Inventory (STAI) measured anxiety in the mothers. This standardised measure of trait and state-anxiety has been fully described in Chapter Six.

#### **THE EFFECT OF 'BABY HELPLINE' AND 'BABY CHECK' ON ANXIETY**

##### **The randomised controlled trial**

###### **The aim of the randomised controlled trial**

The aim of the RCT was to evaluate the effect on anxiety of two support interventions on mothers who had their baby discharged home from a NNU. The support interventions were:-

- i 'Baby Helpline', which offered 24-hour telephone support and information specifically for parents who had taken home their baby from a neonatal unit.
- ii 'Baby Check', a self-assessment scoring system devised to help parents assess the severity of acute illness in babies under six months of age.

###### **Objectives for the randomised controlled trial**

The objectives addressed by these findings were:-

**objective (x) – to determine the effect of 'Baby Helpline' and 'Baby Check' on anxiety of mothers who had their baby discharged from a neonatal unit.**

**objective (xi) – to determine the effect of 'Baby Helpline' and 'Baby Check' on the change in anxiety over time of mothers who had their baby discharged from a neonatal unit.**

## ANXIETY IN NEONATAL UNIT MOTHERS AND POSTNATAL WARD MOTHERS

### The comparison study

#### **The aim of the comparison study**

The aim of the comparison study was to discover the extent of differences between mothers who had their baby discharged from a NNU and mothers who were discharged home with their baby following standard early postnatal care. The mothers who received standard postnatal care were matched with the no-intervention group of the NNU mothers who participated in the RCT.

#### **Objectives for the comparison study**

The objectives addressed by these findings were:-

**objective (xiv) – to discover the level of anxiety of mothers who had their baby discharged from a neonatal unit, and compare this with mothers who were discharged home following standard postnatal care.**

**objective (xv) – to discover the extent of change in anxiety over time of mothers who had their baby discharged from a neonatal unit, and compare this with mothers who were discharged home following standard postnatal care.**

## MOTHERS RECRUITED TO THE STUDIES

### Mothers recruited to the randomised controlled trial

Two hundred and eighty-seven mothers (89% of eligible mothers) were recruited to the RCT around the time their baby was discharged from the NNU. They were randomly allocated to one of four trial arm groups of the RCT following stratification by 'mothering experience' as shown in table 24.

**Table 24      Randomisation to the trial arm groups**

Intervention received	Number in group
Group A – Baby Helpline and Baby Check	71
Group B – Baby Helpline	72
Group C – Baby Check	72
Group D - No intervention	72

Table 24 shows the number of mothers randomly allocated to each trial arm group and the intervention they received. As described in Chapter Three, blocking ensured that similar

numbers would be allocated to each trial arm group. The mothers allocated to Group A received the 'Baby Helpline' and 'Baby Check' interventions, Group B received 'Baby Helpline', Group C received 'Baby Check' and those allocated to Group D received neither intervention.

### **Mothers recruited to the comparison study**

Fifty-four mothers were recruited to the comparison study around the time of their discharge home with their baby from a PNW. As previously described in Chapter Six, the PNW mothers recruited were matched by maternal age and mothering experience with mothers who had been randomly allocated to the no-intervention group (Group D) of the RCT and who had their baby discharged from a NNU at the same time. Therefore all mothers in the comparison study received standard follow-up primary health care with no additional support interventions.

## **THE SPIELBERGER STATE-TRAIT ANXIETY INVENTORY**

### **Process analysis**

#### **Mothers who completed the anxiety questionnaires**

The process analysis of the STAI is considered in relation to the mothers who completed all the questionnaires and on whom further analysis of anxiety was performed.

### ***Randomised controlled trial***

In the RCT, 261 (91%) NNU mothers completed the trait-anxiety questionnaire. The first state-anxiety questionnaire, recorded around the time of their baby's discharge from a NNU, was completed by 268 (93%) mothers. The second state-anxiety questionnaire was recorded at the end of the intervention period, three months following their baby's discharge home and was completed by 206 (72%) mothers.

Of the 261 mothers who completed the trait and first state-anxiety questionnaires, the mean score for those who did not complete the second state-anxiety questionnaire was higher (38.82,  $sd$  11.27) than for those who did complete the second state-anxiety questionnaire (37.02,  $sd$  11.29). It was speculated that those who did not complete the second state-anxiety questionnaire might have been dis-empowered by increased anxiety. However, that was not proven as *t*-tests indicated that the difference in the mean scores between those who completed the second state-anxiety questionnaire and those who did not was not significant (trait-anxiety  $p=0.26$  and first state-anxiety  $p=0.27$ ).

### **Comparison study**

In the comparison study, 110 (87%) mothers completed the trait-anxiety questionnaire. The first state-anxiety questionnaire, recorded around the time of their baby's discharge home, was completed by 116 (92%) mothers. The second state-anxiety questionnaire, recorded three months following their baby's discharge home was completed by 91 (72%) mothers.

### **Mothers on whom further anxiety analysis was performed**

In order to detect change in anxiety over time, further analysis of the STAI was undertaken only on mothers who completed the trait-anxiety and the state-anxiety questionnaires recorded around the time of their baby's discharge (first state-anxiety) and the state-anxiety questionnaire at three months following discharge home (second state-anxiety).

Therefore in the RCT, further analysis of the STAI was undertaken on 194 neonatal unit (NNU) mothers and in the comparison study, further analysis of the STAI was undertaken on 47 matched neonatal unit (MNNU) mothers and 35 postnatal ward (PNW) mothers.

As further analysis of anxiety was conducted on subsets of the original groups of mothers it was important to establish if the subsets of mothers were representative of the entire groups of NNU mothers and PNW mothers.

### **Characteristics of the mothers in the anxiety analysis groups**

#### **Mothers in the randomised controlled trial**

It will be recalled that the NNU mothers in the RCT were stratified by mothering experience prior to being randomly allocated to a trial arm group. Investigation of the characteristics of the 194 mothers, who formed the subset for the STAI analysis, found there were no significant differences in mothering experience between the mothers in the four trial arm groups ( $p=0.93$ ). The number of mothers in each arm of the trial was approximately even. Therefore the randomisation and stratification processes remained consistent within the subset for the STAI analysis.

There were also no significant differences between the mothers in the four trial arm groups for the STAI analysis for the characteristics of maternal age ( $p=0.88$ ), educational attainment on leaving full time education ( $p=0.10$ ), marital status ( $p=0.34$ ), adverse obstetric history ( $p=0.75$ ), delivery type ( $p=0.49$ ) cigarette smoker ( $p=0.75$ ), smoked during pregnancy ( $p=0.98$ ), other household smokers ( $p=0.48$ ), home tenure ( $p=0.94$ ), domestic

access to a telephone ( $p=0.87$ ) or the baby characteristics of birth weight ( $p=0.95$ ), gestation ( $p=0.68$ ), birth at 32 weeks or less gestation and/or 1.5Kg or less birth weight ( $p=0.87$ ), length of stay ( $p=0.33$ ) or discharge weight ( $p=0.37$ ). Therefore the mothers within this STAI analysis group were representative of the total group of NNU mothers. A full description of the characteristics of the mothers and babies in the STAI group is given in Appendix 16.

Consequently, any differences detected in the STAI scores between the mothers in the intervention groups were therefore likely to be an effect of the 'Baby Helpline' or 'Baby Check' interventions rather than due to differences in the characteristics of the mothers or babies.

### **Mothers in the comparison study**

It will be recalled that, in the comparison study, the PNW mothers were matched with the NNU mothers by age and mothering experience. The consistency of the matching process for the mothers who formed the sub-group for the STAI analysis was confirmed as there were no significant differences between the 35 PNW mothers and the 47 MNNU mothers for maternal age ( $p=0.30$ ) or mothering experience ( $p=0.54$ ).

There were also no significant differences between the MNNU mothers and PNW mothers in the STAI analysis group for the characteristics of educational attainment on leaving full time education ( $p=0.06$ ), marital status ( $p=0.19$ ), adverse obstetric history ( $p=0.19$ ), delivery type ( $p=0.09$ ), cigarette smoker ( $p=0.10$ ), smoked during pregnancy ( $p=0.42$ ), other household smokers ( $p=0.86$ ), home tenure ( $p=0.36$ ) or access to a telephone ( $p=0.65$ ). However, as expected, there were significant differences between the baby characteristics of birth weight ( $p<0.001$ ) and gestation ( $p<0.001$ ). Therefore, with the exception of marital status and delivery type, the mothers within this STAI analysis group were representative of the total group of mothers within the comparison study (part 2). A full description of the mother and baby characteristics is given in Appendix 16.

Consequently, any differences detected in the STAI scores between the MNNU mothers and the PNW mothers are likely to be differences in their anxiety rather than due to differences in the characteristics of the mothers.

### Normal values for trait and state-anxiety

#### **Comparison of normal values with mothers' anxiety**

As described in Chapter Six, the scores for the trait and state-anxiety scales range from a minimum of 20 to a maximum of 80, with a higher score indicating a greater degree of anxiety. Table 25 shows the trait and state-anxiety scores for the NNU mothers who participated in the RCT and the MNNU mothers and the PNW mothers compared with the normative or normal values for working women aged 19-39 years (Spielberger et al. 1983).

**Table 25** Mean trait and state-anxiety scores at two time points and the difference between the neonatal unit mothers and the postnatal ward mothers from the normal values (n=229)

Groups of mothers	Trait-anxiety mean (sd)	First state-anxiety mean (sd)	Second state-anxiety mean (sd)
<b>Normal values* (n=210)</b>	<b>36.15 (9.53)</b>	<b>36.17 (10.96)</b>	<b>36.17 (10.96)</b>
<b>Postnatal ward (n=35)</b>	34.49 (7.84)	36.26 (11.70)	32.97 (11.77)
<b>Difference from normal value</b>	<i>p</i> =0.26	<i>p</i> =0.97	<i>p</i> =0.14
<b>Matched neonatal unit (n=47)</b>	38.13 (10.61)	34.28 (10.91)	32.23 (10.27)
<b>Difference from normal value</b>	<i>p</i> =0.24	<i>p</i> =0.28	<i>p</i> =0.02
<b>Neonatal unit (n=194)</b>	38.49 (9.31)	37.02 (11.29)	32.95 (10.41)
<b>Difference from normal value</b>	<i>p</i> =0.01	<i>p</i> =0.45	<i>p</i> =0.003

\* normal values for working women aged 19-39 years

Table 25 shows the mean trait and state-anxiety scores recorded around the time of the baby's discharge home and at three months following discharge and the difference between the NNU mothers and the PNW mothers from the normal values of women of a similar age.

#### ***Randomised controlled trial***

The mean trait-anxiety score of the total group of NNU mothers indicated they were significantly more anxious than the normal value for women of a similar age (*p*=0.01). The first state-anxiety score was not significantly different from the normal value (*p*=0.45) but the second state-anxiety mean score indicated the NNU mothers were significantly less anxious than the normal value for women of a similar age (*p*=0.003).

#### ***Comparison study***

There were no significant differences between the mean scores for the PNW mothers and the normal values for trait-anxiety (*p*=0.26), first state-anxiety (*p*=0.97) or second state-anxiety (*p*=0.14).

The mean trait-anxiety ( $p=0.24$ ) and the first state-anxiety ( $p=0.28$ ) scores for the MNNU mothers were also not significantly different from the normal values. However, their second-state-anxiety scores indicated that the MNNU mothers were significantly less anxious than the normal values for women of a similar age ( $p=0.02$ ).

Therefore we can conclude that anxiety in mothers who had received standard postnatal care was not significantly different from other women of a similar age. However, mothers who had their baby discharged home from a NNU showed a significantly higher propensity towards anxiety but a significantly lower level of anxiety three months after their baby's discharge home than other women of a similar age.

### **Correlations of trait and state anxiety scores**

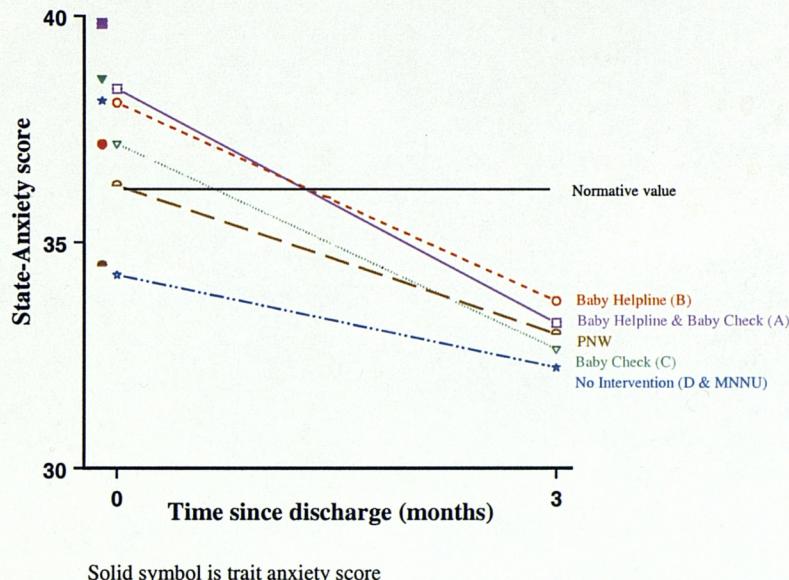
The strength of the relationship between trait-anxiety and state-anxiety at two time points are shown in Appendix 17. The tables of correlations indicate that mothers with, for example, a high trait-anxiety score were likely to show a high state-anxiety score at both time points but particularly at the first state-anxiety score. Similarly, mothers who showed a low first state-anxiety score also showed a low second state-anxiety score. These positive correlations confirmed the strength of the relationship between trait and state-anxiety, and between state-anxiety at two separate time points.

## **ANALYSIS OF ANXIETY IN MOTHERS**

### **Trait and state-anxiety of mothers**

We will now move on to the analysis of anxiety in mothers using the STAI. The mean trait and state-anxiety scores at two time points for the PNW mothers and the MNNU mothers who participated in the comparison study and the NNU mothers who participated in the RCT are presented collectively in figure 6 to illustrate the pattern of anxiety in mothers in this study. The findings will then be described in detail and supported by tables giving the results of the analysis. State-anxiety will be reported both with and without adjustment for trait-anxiety.

**Figure 6 Mean trait, and state-anxiety scores at two time points for all mothers (n=229)**



Solid symbol is trait anxiety score

Figure 6 shows the state-anxiety scores recorded around the time of the baby's discharge home (first state-anxiety) and at three months following discharge (second state-anxiety) for the PNW mothers, the MNNU mothers, and the NNU mothers by intervention group (A-D). The direction of change in state-anxiety clearly shows a reduction in state-anxiety for all mothers between the first and second state-anxiety measurements that indicated an overall decrease in anxiety over time. The trait-anxiety for all mothers and normal value for state-anxiety for working women aged 19-39 years are also shown.

In order that the findings on anxiety for the NNU mothers who participated in the RCT can be located into the context of 'new mother at home', the findings of the comparison study will be present at the beginning of each section followed by the findings of the RCT.

### Mean trait and state-anxiety in postnatal ward mothers and matched neonatal unit mothers

#### *Comparison study*

In support of the findings illustrated in figure 6, table 26 shows the mean trait-anxiety and state-anxiety for the MNNU mothers and the PNW mothers. The differences between these two groups of mothers for trait-anxiety, and state-anxiety at two time points are also shown.

**Table 26** Mean trait and state-anxiety scores and the difference between the matched neonatal unit mothers and the postnatal ward mothers (n=82)

Group	n	Trait-anxiety	First state-anxiety		Second state-anxiety	
			mean (sd)	mean (sd)	adjusted for trait	mean (sd)
Postnatal ward mothers	35	34.49 (7.84)	36.26 (11.70)	37.78 (8.77)	32.97 (11.77)	34.06 (10.52)
Matched neonatal unit mothers	47	38.13 (10.61)	34.28 (10.91)	33.14 (8.25)	32.23 (10.27)	31.42 (8.89)
Difference between groups		<i>p</i> =0.09	<i>p</i> =0.43	<i>p</i> =0.02	<i>p</i> =0.76	<i>p</i> =0.22

Table 26 shows the mean trait and state-anxiety scores for the MNNU mothers and the PNW mothers and the difference between the two groups. The trait-anxiety for the MNNU mothers was higher than the trait-anxiety of the PNW mothers. The first state-anxiety score for the MNNU mothers was lower than the first state-anxiety score for the PNW mothers. The second state-anxiety score for both groups of mothers was lower than their first state-anxiety scores, which indicated a decrease in state-anxiety over time.

However, the *p*-values, derived from *t*-tests, indicated that there were no significant differences in mean STAI scores between the MNNU mothers and the PNW mothers for trait-anxiety (*p*=0.09), state-anxiety around the time of their baby's discharge home (*p*=0.43), or at three months following discharge (*p*=0.76).

Although the difference between the trait-anxiety score of the PNW mothers and the MNNU mothers was not significant, when the state-anxiety scores were adjusted for trait-anxiety, a significant difference in state-anxiety was detected. At the first state-anxiety measurement the MNNU mothers were shown to be significantly less anxious compared with the PNW mothers (*p*=0.02).

Therefore we have seen the fulfilment of **objective (xiv) – to discover the level of anxiety of mothers who had their baby discharged from a neonatal unit, and compare this with mothers who were discharged home following standard postnatal care.**

The findings showed that, when measured with the STAI, there were no significant differences detected between the MNNU mothers and the PNW mothers for trait-anxiety, state-anxiety measured around the time of their baby's discharge home or state-anxiety

measured at three months following discharge home. However, when state-anxiety was adjusted for trait-anxiety, at the first state-anxiety measurement the MNNU mothers were significantly less anxious than the PNW mothers ( $p=0.02$ ).

Therefore we can conclude that there were no significant differences in the propensity for anxiety or actual anxiety between the MNNU mothers and PNW mothers. However, when their state-anxiety level was adjusted for their proneness towards anxiety, the MNNU mothers were significantly less anxious than the PNW mothers around the time their baby was discharged home.

We have seen the trait and state-anxiety scores presented for the MNNU mothers and the PNW mothers in relation to the comparison study. Now we will consider the mean trait and state-anxiety scores for the NNU mothers in the four trial arms or intervention groups of the RCT.

### Mean trait and state-anxiety in neonatal unit mothers

#### *Randomised controlled trial*

In support of the findings illustrated in figure 6, table 27 shows the mean trait-anxiety and state-anxiety for the NNU mothers recorded around the time of their baby's discharge home and at three months following discharge. The state-anxiety scores are shown both with and without adjustment for trait-anxiety.

**Table 27** Mean trait and state-anxiety scores by intervention group (n=194)

Intervention group	n	Trait-anxiety	First state-anxiety		Second state-anxiety	
			mean (sd)	mean (sd)	adjusted for trait (sd)	mean (sd)
Neonatal unit mothers-total	194	38.49 (9.31)	37.02 (11.29)	37.01 (9.26)	32.95 (10.41)	32.95 (9.61)
A - Baby Helpline & Baby Check	52	39.85 (9.35)	38.40 (11.59)	37.46 (8.74)	33.23 (10.47)	32.65 (9.83)
B - Baby Helpline	45	37.18 (8.64)	38.09 (11.81)	39.00 (10.14)	33.71 (10.59)	34.27 (10.62)
C - Baby Check	50	38.62 (8.60)	37.18 (10.70)	37.09 (9.62)	32.64 (10.56)	32.58 (9.25)
D - No intervention	47	38.13 (10.61)	34.28 (10.91)	34.53 (8.23)	32.23 (10.27)	32.39 (8.90)
Difference between groups		$p=0.56$	$p=0.27$	$p=0.13$	$p=0.91$	$p=0.77$

Table 27 shows the mean trait and state-anxiety scores for the NNU mothers by intervention group. Differences between the groups, shown by  $p$ -values, were derived from an analysis of variance. The trait-anxiety scores were all high, compared with the normal

values for women of a similar age shown previously in table 25, but there were no significant differences between the intervention groups ( $p=0.56$ ). There was no significant difference across the four intervention groups for the first state-anxiety recorded around the time of the baby's discharge ( $p=0.27$ ). Therefore the mothers in the four intervention groups had similar baseline anxiety scores around the time of their baby's discharge from a NNU.

There was a trend for second state-anxiety scores to be lower than the scores achieved at the time of the baby's discharge (first state-anxiety). This was seen across all four intervention groups and indicated an overall decrease in anxiety over time. However, there were no significant differences between the four intervention groups for the second state-anxiety recorded three months following discharge home ( $p=0.91$ ).

Even when the state-anxiety scores were adjusted for trait-anxiety there were no significant differences between mothers in the intervention groups for the first state-anxiety ( $p=0.13$ ) or the second state-anxiety ( $p=0.77$ ).

Therefore we have seen the fulfilment of **objective (x) – to determine the effect of ‘Baby Helpline’ and ‘Baby Check’ on anxiety of mothers who had their baby discharged from a neonatal unit.**

The findings showed that, when measured by the STAI, access to the ‘Baby Helpline’ and or ‘Baby Check’ interventions made no significant difference to the state-anxiety of mothers at three months following their baby's discharge from a neonatal unit ( $p=0.91$ ).

Consequently we can conclude that neither the ‘Baby Helpline’ nor ‘Baby Check’ contributed to the lower state-anxiety scores of mothers recorded three months following their baby's discharge home from a NNU. It is however essential not to overlook the other equally important conclusion that access to ‘Baby Helpline’ and or ‘Baby Check’ did not increase the anxiety of mothers after their baby's discharge home from a NNU.

We have looked at state-anxiety at two fixed time points. If we now refer back to figure 6, we can see that the range of scores on the scale for the first state-anxiety scores was wider than the range of scores for the second state-anxiety measurement for all mothers. Therefore the magnitude of change in state-anxiety over the three months was greater for

some mothers than others. We will therefore progress to consider the magnitude of change in state-anxiety scores over time.

### **Magnitude of change in anxiety over time**

We will now consider the magnitude of change in the mothers' state-anxiety between the score achieved around the time of their baby's discharge home and the score recorded at three months after discharge. The change in state-anxiety will be shown both with and without adjustment for trait-anxiety. When considering the magnitude of change in state-anxiety over time it was important to remember, as shown in figure 6, that the mothers with the greatest change in state-anxiety were not necessarily less anxious at the three month measurement than other mothers. Change in anxiety was therefore relative and is described for the MNNU mothers and PNW mothers in relation to the comparison study and the NNU mothers in relation to the RCT.

### **Change in state-anxiety between two time points for the matched neonatal unit mothers and the postnatal ward mothers**

#### ***Comparison study***

The magnitude of change between the state-anxiety scores of mothers at three months following discharge home from their state-anxiety scores recorded at the time of their baby's discharge home are given in table 28.

**Table 28      Change in state-anxiety between two time points for the matched neonatal unit mothers and the postnatal ward mothers (n=82)**

<b>Groups of mothers</b>	<b>n</b>	<b>Change in anxiety at second state-anxiety from first state-anxiety</b>		<b>Change in anxiety at second state-anxiety from first state-anxiety adjusted for trait-anxiety</b>	
		<b>mean</b>	<b>sd</b>	<b>mean</b>	<b>sd</b>
<b>Postnatal ward</b>	35	-3.29	11.97	-3.73	11.72
<b>Matched neonatal unit</b>	47	-2.04	11.85	-1.71	11.68
<b>Difference between groups</b>		<b><i>p=0.64</i></b>		<b><i>p=0.44</i></b>	

Table 28 shows the magnitude of change in state-anxiety between two time points for the MNNU mothers and the PNW mothers. The change in state-anxiety scores are given with and without adjustment for trait-anxiety. Although both the PNW mothers and the MNNU mothers demonstrated a decrease in state-anxiety over time (indicated by the minus score), *t*-tests showed there was no significant difference between the groups of mothers for the change in state-anxiety (*p*=0.64). Even when trait-anxiety was taken into account

and the change in state-anxiety score over time was adjusted for trait-anxiety, there was no significant difference between the PNW mothers and the MNNU mothers ( $p=0.44$ ).

We have seen therefore the fulfilment of **objective (xv) – to discover the extent of change in anxiety over time of mothers who had their baby discharged from a neonatal unit, and compare this with mothers who were discharged home following standard postnatal care.**

The findings showed, when measured with the STAI, there was no significant difference in the magnitude of change in state-anxiety between the MNNU mothers and the PNW mothers at three months following their baby's discharge home from the scores recorded around the time of discharge ( $p=0.64$ ). Even when state-anxiety was adjusted for trait-anxiety there was no significant difference between the two groups of mothers ( $p=0.44$ ).

Therefore we can conclude that magnitude of the decrease in anxiety over time was not significantly different between the mothers who had their baby discharged from a neonatal unit and mothers who had standard postnatal care.

### **Change in state-anxiety between two time points for the neonatal unit mothers**

#### ***Randomised controlled trial***

The effect of the 'Baby Helpline' and 'Baby Check' interventions on the magnitude of change in anxiety for the NNU mothers between the state-anxiety scores at three months following their baby's discharge from the state-anxiety scores recorded at the time of discharge are shown in table 29.

**Table 29      The effect of support interventions on the change in state-anxiety between two time points (n=194)**

Intervention groups	n	Change in anxiety at second state-anxiety from first state-anxiety		Change in anxiety at second state-anxiety from first state-anxiety adjusted for trait-anxiety	
		mean	sd	mean	sd
A - Baby Helpline/Baby Check	52	-5.17	12.90	-4.82	12.35
B - Baby Helpline	45	-4.38	14.25	-4.72	13.74
C - Baby Check	50	-4.54	11.11	-4.51	11.45
D - No intervention	47	-2.04	11.85	-2.14	11.70
<b>Difference between groups</b>		<b><math>p=0.63</math></b>		<b><math>p=0.67</math></b>	

Table 29 shows the effect of 'Baby Helpline' and 'Baby Check' on the change in state-anxiety between two time points. The changes in state-anxiety are given both with and without adjustment for trait-anxiety. A decrease in state-anxiety over time was seen in all four intervention groups. The mothers in group D (with no additional support intervention) showed least change in their state-anxiety whilst the mothers in group A, who received both 'Baby Helpline' and 'Baby Check', showed the greatest change in their state-anxiety (refer back to figure 6 to see these findings illustrated). However, analysis of variance showed there were no significant differences between the four intervention groups for the magnitude of change in state-anxiety scores at the end of the three month intervention period (second state-anxiety) from the state-anxiety scores recorded at the time of the baby's discharge home (first state-anxiety) ( $p=0.63$ ). Even when the changes in state-anxiety scores were adjusted for trait-anxiety there was no significant difference demonstrated between the intervention groups ( $p=0.67$ ).

However, as the magnitude of change in anxiety over time was greater for the mothers who received the interventions (groups A-C) compared with the mothers who received no intervention (group D) the effect of receiving any intervention compared with not receiving an intervention was explored and is shown in table 30.

**Table 30 Change in state-anxiety for mothers who received any intervention and mothers who received no intervention (n=194)**

Intervention groups	Change in state-anxiety (sd)
Any intervention (groups A+B+C) - n=147	-4.71 (12.68)
No intervention (group D) - n=47	-2.04 (11.85)
Difference between groups	$p=0.20$

Table 30 shows that when all the mothers who received an intervention were combined and compared with the mothers who received no-intervention there was still no significant difference in the change in their anxiety over time ( $p=0.20$ ).

We have therefore seen the fulfilment of objective (xi) – to determine the effect of 'Baby Helpline' and 'Baby Check' on the change in anxiety over time of mothers who had their baby discharged from a neonatal unit.

The findings showed that, when measured with the STAI, there were no significant differences between the mothers in the intervention groups for the magnitude of change in

state-anxiety at three months after the baby's discharge home from the state-anxiety scores recorded around the time of discharge ( $p=0.63$ ). There was also no significant difference between the mothers in the intervention groups when the changes in state-anxiety scores were adjusted for trait-anxiety ( $p=0.67$ ). Even when all the mothers who received an intervention were combined and compared with the mothers who received no-intervention, there was still no significant difference in the change in their anxiety over time ( $p=0.20$ ).

We can therefore conclude that the magnitude of change in anxiety over time for mothers who had their baby discharged home from a neonatal unit was neither increased or decreased by their access to 'Baby Helpline' and or 'Baby Check'.

## **SYNOPSIS OF CHAPTER EIGHT**

This chapter has comprehensively described anxiety in the matched neonatal unit mothers and the PNW mothers in relation to the comparison study (part 2) and the neonatal unit mothers in relation to the RCT. Anxiety was measured with the STAI.

Anxiety in mothers who had received standard postnatal care was not significantly different from other women of a similar age. However, mothers who had their baby discharged home from a neonatal unit showed a significantly higher propensity towards anxiety but a significantly lower level of anxiety three months after their baby's discharge home than other women of a similar age.

There were no significant differences in the propensity for anxiety or actual anxiety between the matched neonatal unit mothers and PNW mothers. However, when their state-anxiety level was adjusted for their proneness towards anxiety, the matched neonatal unit mothers were significantly less anxious than the PNW mothers around the time their baby was discharged home.

The magnitude of the decrease in anxiety over time was not significantly different between the mothers who had their baby discharged from a neonatal unit and mothers who had standard postnatal care with or without adjustment for trait-anxiety.

There was no significant difference in anxiety or the change in anxiety over time between the mothers in the four trial arm groups at three months following their baby's discharge from a neonatal unit with or without adjustment for trait-anxiety.

Therefore access to 'Baby Helpline' or 'Baby Check' did not contribute to the lower anxiety of mothers recorded three months following their baby's discharge home from a neonatal unit. It is however essential not to overlook the equally important conclusion that access to 'Baby Helpline' and or 'Baby Check' did not increase the anxiety of mothers after their baby's discharge home from a neonatal unit. In addition, the magnitude of change in the mothers' anxiety over time was neither increased nor decreased by their access to 'Baby Helpline' and or 'Baby Check'.

The following chapter will consider the findings on the mood states of mothers who participated in the comparison study (part 2) and the RCT.

## **CHAPTER NINE**

### **MAIN STUDY FINDINGS** **MOOD STATES OF MOTHERS**

#### **THE AIM OF THIS CHAPTER**

The aim of this chapter is to present the findings on mood states of mothers in relation to the randomised controlled trial (RCT) and the comparison study (part 2). The Profile of Mood States-Bi-Polar Form (POMS-Bi) measured mood in the mothers. This standardised measure of mood states has been fully described in Chapter Six.

#### **THE EFFECT OF 'BABY HELPLINE' AND 'BABY CHECK' ON MOOD**

##### **The randomised controlled trial**

###### **The aim of the randomised controlled trial**

The aim of the RCT was to evaluate the effect on mood states of two support interventions on mothers who had taken their baby home from a NNU.

- i 'Baby Helpline', which offered 24-hour telephone support and information specifically for parents who had taken home their baby from a neonatal unit.
- ii 'Baby Check', a self-assessment scoring system devised to help parents assess the severity of acute illness in babies under six months of age.

###### **Objectives for the randomised controlled trial**

The objectives addressed by these findings were:-

**objective (xii) – to determine the effect of 'Baby Helpline' and 'Baby Check' on the mood states of mothers who had their baby discharged from a neonatal unit.**

**objective (xiii) – to determine the effect of 'Baby Helpline' and 'Baby Check' on the change in mood states over time of mothers who had their baby discharged from a neonatal unit.**

## MOOD IN NEONATAL UNIT MOTHERS AND POSTNATAL WARD MOTHERS

### The comparison study

#### **The aim of the comparison study**

The aim of the comparison study was to discover the extent of differences in mood states between mothers who had their baby discharged from a NNU and mothers who had standard postnatal care and were discharged home with their baby from a PNW. The mothers who received standard postnatal care were matched with the no-intervention group (group D) of the NNU mothers who participated in the RCT. As in the previous chapter, the findings of the comparison study are presented in parallel to the RCT.

#### **Objectives for the comparison study**

The objectives addressed by these findings were:-

**objective (vii) – to discover the level of mood states of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers who were discharged home following standard postnatal care.**

**objective (viii) – to discover the extent of change in mood states over time of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers who were discharged home following standard postnatal care.**

## THE PROFILE OF MOOD STATES BI-POLAR FORM

### Process analysis

#### **Mothers who completed the mood questionnaires**

The process analysis of the POMS-Bi will be considered in relation to the mothers who completed the questionnaires and the mothers on whom further analysis of mood was performed. Only questionnaires with all 72 questions completed were valid and used for the analysis. Table 31 shows the number of mothers who completed all 72 questions on the POMS-Bi questionnaire.

**Table 31** Mothers who completed the mood questionnaire at four time points

Groups of mothers	At discharge home n (%)	1 month after discharge n (%)	2 months after discharge n (%)	3 months after discharge n (%)
<b>Matched neonatal unit mothers</b>	56 (78)	40 (56)	33 (46)	34 (47)
<b>Postnatal ward mothers</b>	45 (83)	32 (59)	33 (61)	31 (57)
<b>Neonatal unit mothers</b>	233 (81)	150 (52)	140 (49)	141 (49)

Table 31 shows the number of mothers who completed the POMS-Bi questionnaire around the time of discharge home and at one, two and three months following discharge home.

#### ***Randomised controlled trial***

For the RCT, the POMS-Bi questionnaire was completed by 233 neonatal unit (NNU) mothers at the time of the baby's discharge, 150 at one month following discharge, 140 (49%) two months following discharge and 141 (49%) mothers at three months following their baby's discharge from a NNU.

#### ***Comparison study***

For the comparison study, the POMS-Bi questionnaire was completed by 56 matched neonatal unit (MNNU) mothers around the time of their baby's discharge home, 40 mothers at one month, 33 mothers at two months and 34 mothers at three months after their baby's discharge from a NNU. The POMS-Bi questionnaire was completed by 45 postnatal ward (PNW) mothers around the time of their discharge home, 32 mothers at one month, 33 mothers at two months and 31 mothers at three months after their discharge from a PNW.

#### **Mothers on whom further mood analysis was performed**

In order to detect change in mood states over time, further analysis of the POMS-Bi questionnaire was undertaken only on the mothers who completed all 72 questions around the time of their baby's discharge home and at one, two and three months following discharge.

Therefore in the RCT, further analysis of the POMS-Bi was undertaken on 110 NNU mothers and in the comparison study further analysis of the POMS-Bi was undertaken on 28 MNNU mothers and 22 PNW mothers. As further analysis of the POMS-Bi and the findings presented were conducted on subsets of the original groups of mothers it was

important to establish if the subsets were representative of the original groups of NNU mothers and PNW mothers.

### **Characteristics of the mothers in the mood analysis groups**

#### **Mothers in the randomised controlled trial**

It will be recalled that NNU mothers in the RCT were stratified by mothering experience prior to randomisation to a trial arm group. Investigation of the characteristics of the 110 NNU mothers who formed the subset for the POMS-Bi analysis found there were no significant differences between the four trial arm groups of mothers for mothering experience ( $p=0.78$ ). The number of mothers in each group remained approximately even. Therefore the stratification and randomisation process remained consistent within the subset of mothers for the POMS-BI analysis.

There were also no significant differences between the mothers in the four trial arm groups for the POMS-Bi analysis for the characteristics of maternal age ( $p=0.53$ ), marital status ( $p=0.81$ ), adverse obstetric history ( $p=0.89$ ), delivery type ( $p=0.42$ ), cigarette smoker ( $p=0.61$ ), smoked during pregnancy ( $p=0.56$ ), other household smokers ( $p=0.68$ ), home tenure ( $p=0.41$ ), access to a telephone ( $p=0.99$ ) or the baby characteristics of birth weight ( $p=0.90$ ), gestation ( $p=0.64$ ), birth at 32 or less weeks gestation and/or 1.5Kg or less birth weight ( $p=0.96$ ), length of stay ( $p=0.51$ ) or discharge weight ( $p=0.31$ ). However, there was a significant difference in educational attainment of leaving full time education ( $p=0.04$ ) but the high number of 'vocational' qualifications in group A and the high number of 'other' qualifications in group D probably accounts for this difference. Therefore the mothers in the POMS-Bi group were largely representative of the total group of NNU mothers. Consequently, any differences detected in the POMS-Bi scores between the mothers in the trial arm groups were therefore likely to be an effect of 'Baby Helpline' or 'Baby Check' rather than a difference in the characteristics of mothers or babies. A full description of the characteristics of the POMS-Bi mothers and babies is given in Appendix 18.

#### **Mothers in the comparison study**

It will be recalled that the NNU mothers were matched with the PNW mothers by maternal age and mothering experience in the comparison study. The effectiveness of the matching process for the mothers who formed the sub-group for the POMS-BI analysis was confirmed by there being no significant differences between the 28 MNNU mothers and the 22 PNW mothers for age ( $p=0.58$ ) or mothering experience ( $p=0.52$ ).

There were also no significant differences between the MNNU and PNW mothers in the POM-Bi analysis group for the characteristics of educational attainment on leaving full time education ( $p=0.25$ ), marital status ( $p=1.00$ ), adverse obstetric history ( $p=0.43$ ), delivery type ( $p=0.30$ ), cigarette smoker ( $p=0.73$ ), smoked during pregnancy ( $p=1.00$ ), other household smokers ( $p=0.88$ ), home tenure ( $p=0.67$ ) or access to a telephone ( $p=0.31$ ). However, as expected, there were significant differences between the baby characteristics of birth weight ( $p<0.001$ ) and gestation ( $p<0.001$ ). Therefore, with the exception of marital status and delivery type, the mothers in this group were representative of all the mothers in the comparison study (part 2). A full description of these mother and baby characteristics is given in Appendix 18.

Consequently, any differences detected in the POMS-Bi scores between the MNNU mothers and the PNW mothers is likely to be a difference in mood rather than due to differences in the characteristics of mothers.

### **Mood dimensions**

The POMS-Bi questionnaire measures six negative and six positive mood dimensions and the high and low scoring mood dimensions are shown in table 32.

**Table 32      High and low scoring mood dimensions of the Profile of Mood states Bi-Polar Form**

<b>Mood dimension High score</b>	<b>Mood dimension Low score</b>
Composed	Anxious
Agreeable	Hostile
Elated	Depressed
Confident	Unsure
Energetic	Tired
Clear headed	Confused

### **Comparison of normal values and mood states scores**

#### **Comparison of the mood scores of the matched neonatal unit mothers with normal value scores**

The mean and standard deviation scores for the six mood dimensions for the MNNU mothers at four time points and the normal values for British adults are shown in table 33.

**Table 33** Normal values and the mean scores for the six mood states at four time points for the matched neonatal unit mothers (n=28)

Mood state	British adult normal values (n=416)	At discharge	1 month after discharge	2 months after discharge	3 months after discharge
		mean (sd)	mean (sd)	mean (sd)	mean (sd)
<b>Composed-Anxious</b>	21.22 (7.31)	18.36 (8.07) <i>p</i> =0.07	25.07 (6.46) <i>p</i> =0.002	25.00 (6.08) <i>p</i> =0.002	26.25 (6.08) <i>p</i> <0.001
<b>Agreeable-Hostile</b>	25.50 (6.51)	26.36 (6.36) <i>p</i> =0.49	26.32 (6.01) <i>p</i> =0.48	26.61 (6.07) <i>p</i> =0.25	29.11 (4.90) <i>p</i> <0.001
<b>Elated-Depressed</b>	22.49 (7.24)	22.93 (7.34) <i>p</i> =0.76	25.54 (6.82) <i>p</i> =0.02	25.96 (7.27) <i>p</i> =0.01	28.39 (6.27) <i>p</i> <0.001
<b>Confident-Unsure</b>	20.11 (6.94)	18.29 (7.60) <i>p</i> =0.22	23.82 (6.00) <i>p</i> =0.002	24.21 (6.70) <i>p</i> =0.002	26.29 (7.09) <i>p</i> <0.001
<b>Energetic-Tired</b>	22.85 (7.56)	14.07 (6.13) <i>p</i> <0.001	17.18 (5.95) <i>p</i> <0.001	17.68 (7.87) <i>p</i> <0.001	21.61 (8.10) <i>p</i> =0.43
<b>Clear headed-Confused</b>	23.25 (7.19)	20.07 (7.93) <i>p</i> =0.03	26.11 (6.00) <i>p</i> =0.02	26.75 (6.74) <i>p</i> =0.008	28.18 (6.52) <i>p</i> <0.001

Table 33 showed the mean scores for the MNNU mothers for the six mood states recorded around the time of their baby's discharge home and at one, two and three months after discharge with the normal values for comparison. Compared with the normal values for British adults, the MNNU mothers were significantly:-

- less energetic and less clear headed around the time of their baby's discharge home
- more composed, more elated, more confident, less energetic and more clear headed at one month after their baby's discharge home
- more composed, more elated, more confident, less energetic and more clear headed at two months after their baby's discharge home
- more composed, more agreeable, more elated, more confident and more clear headed at three months after their baby's discharge home.

#### **Comparison of the mood scores of the postnatal ward mothers with normal value scores**

Table 34 shows the normal values for the six mood dimensions for British adults and the mean and standard deviation scores for the mood states of the PNW mothers at four time points.

**Table 34** Normal values and the mean scores for six mood states at four time points for the postnatal ward mothers (n=22)

Mood state	British adult normal values (n=416)	At discharge	1 month after discharge	2 months after discharge	3 months after discharge
		mean (sd)	mean (sd)	mean (sd)	mean (sd)
<b>Composed-Anxious</b>	21.22 (7.31)	21.95 (8.51) <i>p</i> =0.70	22.64 (8.67) <i>p</i> =0.23	24.59 (6.82) <i>p</i> =0.02	23.73 (8.98) <i>p</i> =0.20
<b>Agreeable-Hostile</b>	25.50 (6.51)	28.23 (5.60) <i>p</i> =0.03	25.36 (7.91) <i>p</i> =0.42	27.91 (7.32) <i>p</i> =0.13	25.64 (10.70) <i>p</i> =0.55
<b>Elated-Depressed</b>	22.49 (7.24)	25.45 (6.80) <i>p</i> =0.05	23.82 (8.76) <i>p</i> =0.45	27.00 (6.25) <i>p</i> =0.001	25.27 (10.19) <i>p</i> =0.21
<b>Confident-Unsure</b>	20.11 (6.94)	20.59 (5.73) <i>p</i> =0.70	21.27 (9.54) <i>p</i> =0.58	25.91 (5.83) <i>p</i> <0.001	24.27 (9.40) <i>p</i> =0.07
<b>Energetic-Tired</b>	22.85 (7.56)	17.00 (8.12) <i>p</i> <0.001	17.32 (8.92) <i>p</i> =0.004	22.86 (7.05) <i>p</i> =0.95	22.23 (10.62) <i>p</i> =0.79
<b>Clear headed-Confused</b>	23.25 (7.19)	21.91 (7.96) <i>p</i> =0.84	24.59 (9.29) <i>p</i> =0.50	28.09 (6.65) <i>p</i> =0.001	25.73 (10.58) <i>p</i> =0.28

Table 34 showed the mean scores for six mood states for the PNW mothers recorded around the time of their baby's discharge home and at one, two and three months after discharge and the normal values for mood states scores for British adults. Compared with the normal values for British adults, the PNW mothers were significantly:-

- more agreeable, more elated and less energetic around the time of their baby's discharge home
- less energetic at one month after their baby's discharge home
- more composed, more elated, more confident and more clear headed two months after their baby's discharge home.

#### **Comparison of the mood scores of the neonatal unit mothers with normal value scores**

Table 35 shows the mean scores and standard deviations for the six mood dimensions at four time points for the NNU mothers compared with the normal values for British adults.

**Table 35 Mean scores for the six mood states at four time points and difference from normal values for the neonatal unit mothers (n=110)**

Mood state	British adult normal values (n=416)	At discharge	1 month after discharge	2 months after discharge	3 months after discharge
	mean (sd)	mean (sd)	mean (sd)	mean (sd)	mean (sd)
<b>Composed-Anxious</b>	21.22 (7.31)	17.03 (7.67) <i>p</i> <0.001	23.71 (6.60) <i>p</i> <0.001	24.25 (6.26) <i>p</i> <0.001	25.21 (6.11) <i>p</i> <0.001
<b>Agreeable- Hostile</b>	25.50 (6.51)	25.85 (6.13) <i>p</i> =0.60	25.75 (6.30) <i>p</i> =0.71	27.19 (5.78) <i>p</i> =0.008	28.00 (6.29) <i>p</i> <0.001
<b>Elated- Depressed</b>	22.49 (7.24)	20.40 (7.55) <i>p</i> =0.009	24.36 (7.00) <i>p</i> =0.001	25.42 (7.54) <i>p</i> <0.001	26.93 (6.85) <i>p</i> <0.001
<b>Confident- Unsure</b>	20.11 (6.94)	16.95 (7.08) <i>p</i> <0.001	22.14 (6.51) <i>p</i> =0.04	23.43 (6.80) <i>p</i> <0.001	24.53 (6.78) <i>p</i> <0.001
<b>Energetic- Tired</b>	22.85 (7.56)	13.35 (7.03) <i>p</i> <0.001	15.92 (7.82) <i>p</i> <0.001	18.15 (8.09) <i>p</i> <0.001	20.93 (7.98) <i>p</i> =0.02
<b>Clear headed- Confused</b>	23.25 (7.19)	19.15 (7.70) <i>p</i> <0.001	24.75 (6.32) <i>p</i> =0.03	26.00 (6.55) <i>p</i> <0.001	27.10 (6.21) <i>p</i> <0.001

Table 35 showed the mean scores for the six mood states for the NNU mothers recorded around the time of their baby's discharge home and at one, two and three months after discharge and differences from the normal values for British adults. Compared with the normal values for British adults, the NNU mothers were significantly:-

- less composed, less elated, less confident, less energetic and less clear headed around the time of their baby's discharge home
- more composed, more elated, more confident, less energetic and more clear headed at one month after their baby's discharge home
- more composed, more agreeable, more elated, more confident, less energetic and more clear headed at two months after their baby's discharge home
- more composed, more agreeable, more elated, more confident, less energetic and more clear headed at three months after their baby's discharge home.

Therefore we can conclude that there were significant differences between the mood states of new mothers and the mood states of the normal British adult. The finding that new mothers were significantly less energetic than other adults was not surprising, as feeling profoundly tired appears to be a common feature of early motherhood. However,

mothers who had their baby discharged home from a NNU showed significantly lower mood states around discharge followed positive differences from the normal values over a longer period of time and over a wider range of mood states than the PNW mothers.

### **Correlation of mood states**

The strength of the relationships between the six mood states recorded around the time of the baby's discharge home, and at one, two and three months after discharge are given in Appendix 19. All the mood states were highly correlated at the baseline or discharge reading and at one, two and three months following discharge. These highly correlated scores illustrated that if one mood state achieved a high or low score on the POMS-Bi scale then the other five mood states were also likely to be high or low scores at the same time point. The correlation was equally strong at all four time points.

Appendix 20 shows the correlation between the POMS-Bi and the STAI. The highly correlated results indicated that the STAI and POMS-Bi were measuring the concept of emotional health in a similar way.

## **ANALYSIS OF MOOD IN MOTHERS**

### **Comparable values for mood states**

We will now consider the mood profile of the mothers for six mood states at four points in time. Even though the scales for all of the six mood states were the same length, the mood states were not directly comparable with each other because, for example, the effect of a five point change in one mood state did not necessarily have a commensurate effect on another mood state. A common unit of measurement was therefore required to make the six mood scales comparable with each other. The 'raw' scores for all the mothers were therefore converted to T-scores that gave each scale a mean of 50 and a standard deviation of 10 (Lorr and McNair, 1988).

### **Mean T-scores for the profile of mood states**

The following six graphs show the mood state scores at four time points and the pattern of change for the six mood states over time. The mood states were recorded around the time of the baby's discharge home and at one, two and three months following discharge for the matched neonatal unit (MNNU) mothers and the postnatal ward (PNW) mothers for the comparison study and the NNU mothers in the RCT by intervention group.

The actual T-scores for the six mood states at the four time points and the change in mood states over time are presented in tables 36-46 following the graphs. These tables will identify the extent of differences between the MNNU mothers and the PNW mothers, and the differences between the intervention groups of the NNU mothers.

### T-scores for the composed-anxious mood state of mothers

**Figure 7 T-scores for the composed-anxious mood state by group at four time points (n=132)**

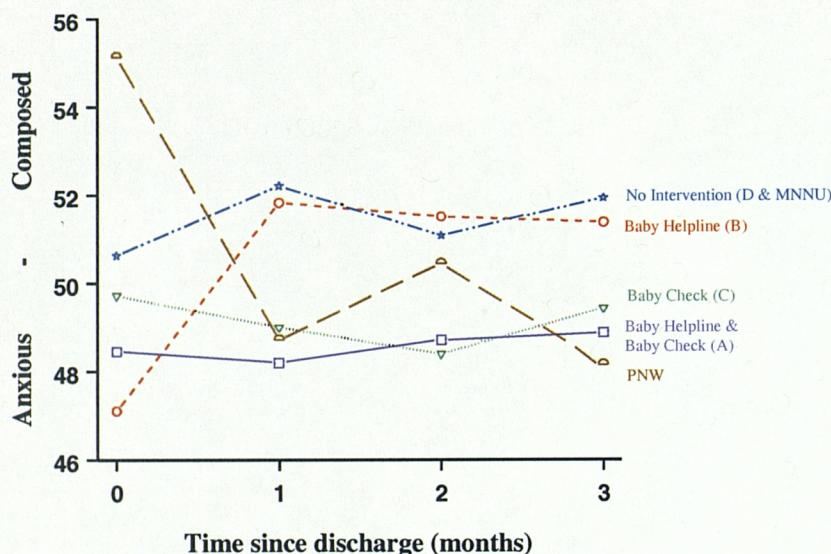


Figure 7 shows the scores at each time point and the pattern of change on the composed-anxious mood scale for the MNNU mothers, PNW mothers and the NNU mothers by intervention group (A-D). Scores above the mean (50) indicate that mothers were relatively more composed and scores below the mean (50) indicate that mothers were relatively more anxious on the bi-polar scale.

### Comparison study

The MNNU mothers and the PNW mothers moved in opposite directions on the scale at each time point. However, the MNNU mothers always remained above the mean (50) whilst the PNW mothers dropped below the mean (50) at one and three months after discharge home.

### Randomised controlled trial

The NNU mothers who received 'Baby Helpline' (group B) and those who received neither intervention (group D) made a positive change on the composed-anxious scale between

discharge and one month, whilst mothers who received both 'Baby Helpline' and 'Baby Check' (group A) and those who received 'Baby Check' (group C) made a slight negative change. There was a degree of levelling of mood for all groups of mothers at two months after discharge. At three months following the baby's discharge home, the mothers who received 'Baby Helpline' (group B) and those who received neither intervention (group D) had polarised just above the mean (50) whilst the mothers who received both interventions (group A) and those who received 'Baby Check' (group C) were polarised just below the mean (50) on the scale.

### T-scores for the agreeable-hostile mood state of mothers

**Figure 8 T-scores for the agreeable-hostile mood state by group at four time points (n=132)**

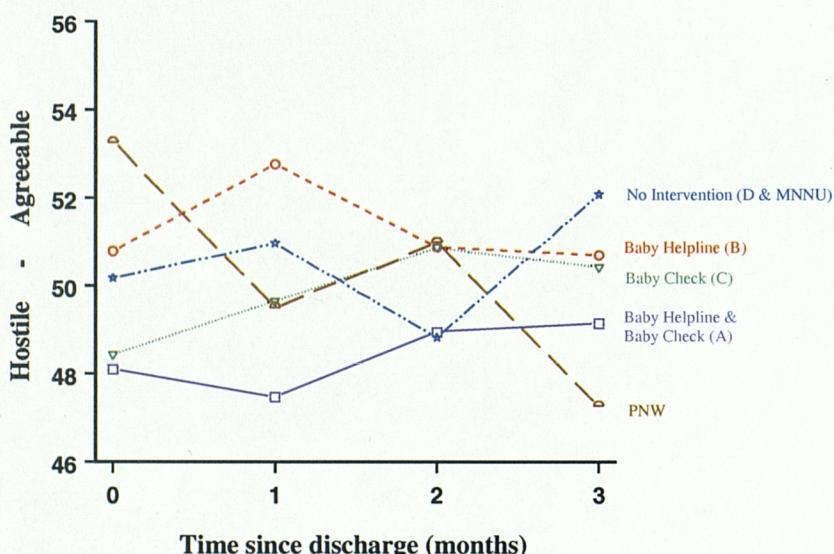


Figure 8 shows the scores at each time point and the pattern of change on the agreeable-hostile mood scale for the MNNU mothers, PNW mothers and the NNU mothers by intervention group (A-D). Scores above the mean (50) indicate mothers were relatively more agreeable and scores below the mean (50) indicate that mothers were relatively more hostile on the bi-polar scale.

### Comparison study

The MNNU mothers and PNW mothers both scored above the mean (50) around the time of their baby's discharge home. The MNNU and PNW mothers changed mood in opposite directions at one, two and three months after discharge. For the two groups of mothers

their relative positions on the scale was reversed at three months from their positions at the time of the baby's discharge home.

### **Randomised controlled trial**

At the baseline record, the NNU mothers who received both the 'Baby Helpline' and 'Baby Check' (group A) and mothers who received 'Baby Check' (group C) were below the mean (50) and mothers who received 'Baby Helpline' (group B) and mothers who received neither intervention (group D) clustered just above the mean (50) on the scale. At one month the mothers in groups B, C and D made a positive mood change. At two months following discharge, the mothers in groups A and C improved their mood whilst the mothers in groups B and D deteriorated on the scale. At three months, the mothers in groups A, B and C remained fairly consistent with their two month score whilst the mothers in group D made a positive change from below to above the mean (50) on the mood scale. However, the scores at three months were little changed from the baseline scores.

### **T-scores for the elated-depressed mood state of mothers**

**Figure 9 T-scores for the elated-depressed mood state by group at four time points (n=132)**

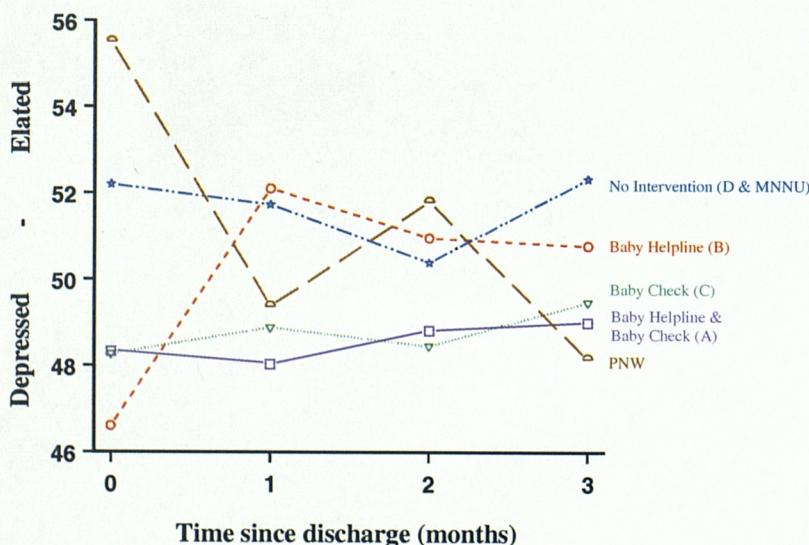


Figure 9 shows the scores at each time point and the pattern of change on the elated-depressed mood scale for the MNNU mothers, PNW mothers and the NNU mothers by intervention group (A-D). Scores above the mean (50) indicate that mothers were relatively more elated and scores below the mean (50) indicate that mothers were relatively more depressed on the bi-polar scale.

***Comparison study***

The MNNU mothers and the PNW mothers both scored above the mean (50) around the time of their baby's discharge home but decreased in mood at one month after discharge, the PNW mothers became less elated more dramatically than the MNNU mothers. The MNNU mothers continued to become less elated at two months after discharge whilst the PNW mothers made some improvement in mood. At three months following their baby's discharge, the MNNU mothers scored approximately the same as they did at the baseline whilst the PNW mothers scored considerably lower on the scale. The relative positions of the MNNU mothers and the PNW mothers at three months were reversed from their position at the time of discharge.

***Randomised controlled trial***

All the NNU mothers who received the 'Baby Helpline' and 'Baby Check' (groups A, B and C) scored below the mean (50) which indicated they felt more depressed than the mothers who did not receive an intervention (group D) around the time of discharge home. At one month after discharge, the mothers who received 'Baby Helpline' (group B) made a great improvement in mood which resulted in the mothers in groups B and D being above the mean (50) whilst the mothers who received both interventions (group A) and the mothers who received 'Baby Check' (group C) remained below the mean (50). The mothers in groups A and C changed mood very little and remained below the mean (50) at two and three months after discharge. The mothers in groups B and D dipped mood slightly at 2 months but recovered (group D) or remained about the same (group B) at three months after discharge.

## T-scores for the confident-unsure mood state of mothers

**Figure 10 T-scores for the confident-unsure mood state by group at four time points (n=132)**

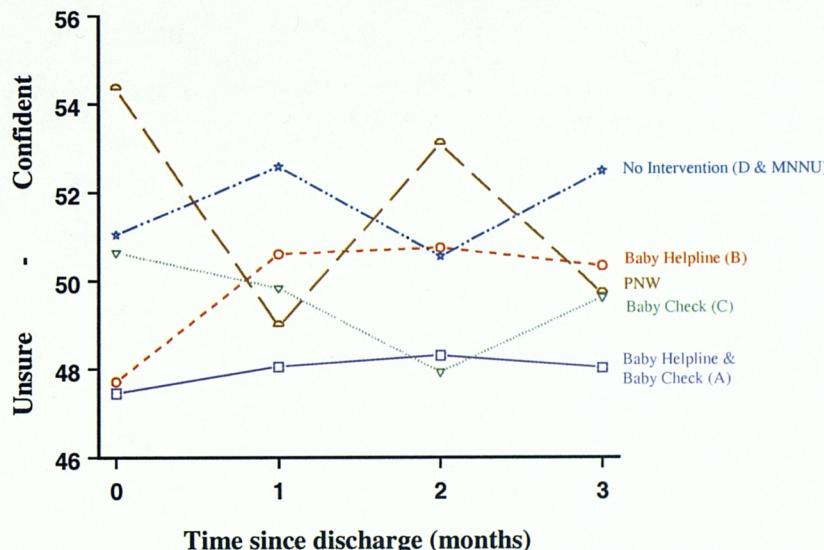


Figure 10 shows the scores at each time point and the pattern of change on the confident-unsure mood scale for the MNNU mothers, PNW mothers and the NNU mothers by intervention group (A-D). Scores above the mean (50) indicate that mothers were relatively more confident and scores below the mean (50) indicate that mothers were relatively more unsure on the bi-polar scale.

### ***Comparison study***

Both the PNW mothers and the MNNU mothers scored above the mean (50) around the time of the baby's discharge. At one month after discharge, MNNU mothers improved in confidence on the scale, decreased in confidence at two months but improved again at three months. All their scores were above the mean (50) score. In contrast, the PNW mothers became more unsure at one month, improved at two months and deteriorated on the scale again at three months after their baby's discharge home. The relative position of the MNNU and PNW mothers on the mood scale at three months was reversed from their position at the time of their baby's discharge home.

### ***Randomised controlled trial***

The NNU mothers who received 'Baby Check' (group C) and those who received neither intervention (group D) clustered above the mean (50) at the time of discharge home.

Mothers who received both 'Baby Helpline' and 'Baby Check' (group A) and those who received 'Baby Helpline' (group B) clustered below the mean (50) around the time of the baby's discharge home. There was a wider dispersion between the four groups at one month after discharge. At two months after discharge, the mothers in groups C and D deteriorated on the scale which resulted in the mothers in groups B and D being clustered above the mean (50) whilst the mothers in groups A and C were clustered below the mean (50). At three months following discharge, the mothers in groups C and D recovered on the scale. The mothers in groups A and B remained relatively consistent on the scale at one, two and three months.

### T-scores for the energetic-tired mood states of mothers

**Figure 11 T-scores for the energetic-tired mood state by group at four time points (n=132)**

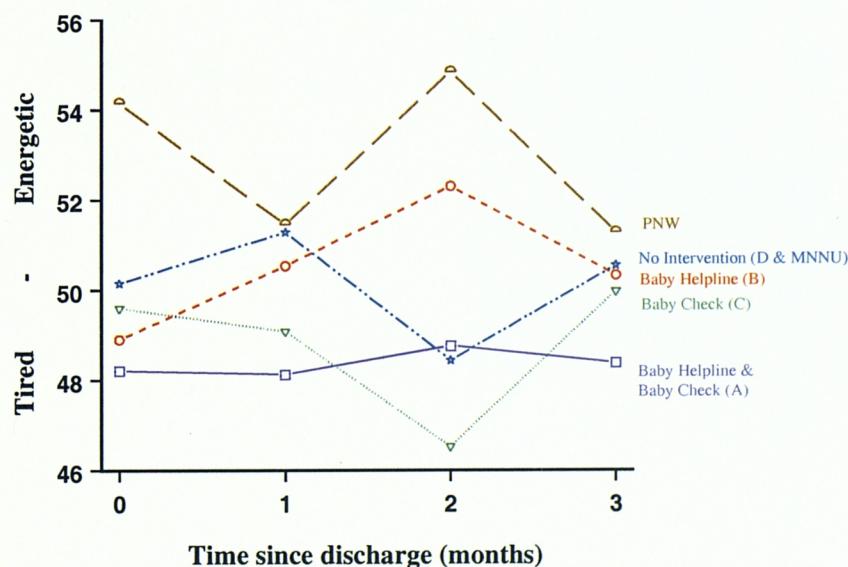


Figure 11 shows the scores at each time point and the pattern of change on the energetic-tired mood scale for the MNNU mothers, PNW mothers and the NNU mothers by intervention group (A-D). Scores above the mean (50) indicate that mothers were relatively more energetic and scores below the mean (50) indicate that mothers were relatively more tired on the bi-polar scale.

### Comparison study

The MNNU mothers and PNW mothers scored at or above the mean (50) around the time of their baby's discharge home. At one month after discharge, the MNNU mothers became

more energetic in contrast to the PNW mothers who became less energetic than at discharge. At two months after discharge, the MNNU mothers became less energetic whilst the PNW mothers became more energetic and at three months following discharge this was reversed and they returned, approximately, to the scores obtained at one month after the baby's discharge home.

### **Randomised controlled trial**

The NNU mothers who received both 'Baby Helpline' and 'Baby Check' (group A) remained more or less level in their mood, below the mean (50), at one, two and three months. The mothers who received 'Baby Helpline' (group B) and those who received neither intervention (group D) improved slightly in mood at one month whilst the mothers who received 'Baby Check' (group C) became slightly worse in mood. Group B mothers continued to show an improvement in mood at the two month record whilst groups C and D mothers deteriorated. At three months after discharge groups C and D mothers improved and group B mothers became worse in mood to approximately the same point as the mothers in groups C and D.

### **T-scores for the clear headed-confused mood states of mothers**

**Figure 12** T-scores for the clear headed-confused mood state by group at four time points (n=132)

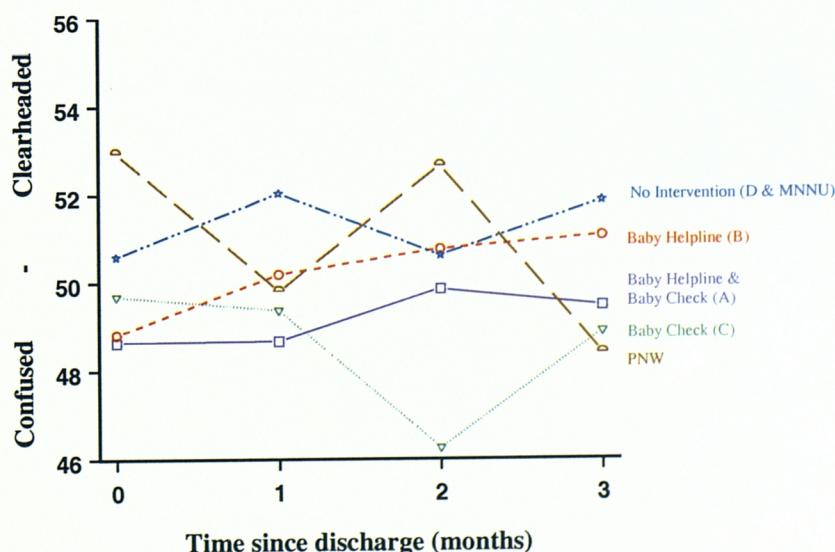


Figure 12 shows the scores at each time point and the pattern of change on the clear headed-confused mood scale for the MNNU mothers, PNW mothers and the NNU mothers

by intervention group (A-D). Scores above the mean (50) indicate that mothers were relatively more clear headed and scores below the mean (50) indicate that mothers were relatively more confused on the bi-polar scale.

### ***Comparison study***

The MNNU mothers and the PNW mothers scored above the mean (50) around the time of discharge. At one month after discharge, the MNNU mothers improved, then decreased at two months and increased again at three months after discharge with all their scores being above the mean (50). At one month the PNW mothers decreased, improved at two months but decreased again on the scale at three months after discharge. At three months after discharge, the MNNU mothers score was similar to that obtained at one month after discharge whilst the PNW mothers were lower on the scale. The relative position of the MNNU and PNW mothers on the scale at three months was reversed from their position at the time of their baby's discharge home.

### ***Randomised controlled trial***

The NNU mothers in all groups were clustered around the mean (50) at the time of their baby's discharge home. At one month after discharge the mothers who received both 'Baby Helpline' and 'Baby Check' (group A) and those who received 'Baby Check' (group C) remained at similar levels whilst the mothers who received 'Baby Helpline' (group B) and those who received neither intervention (group D) showed an improvement in mood. At two months following discharge, the mothers in groups A and B improved slightly and the group D mothers deteriorated slightly to a similar level whilst the mothers in group C showed a deterioration. At three months after discharge, the mothers in group A remained about the same whilst the mothers in all the other groups showed an improvement in mood. Therefore at three months, the mothers in groups A and C were below the mean (50) and the mothers in groups B and D were above the mean (50) on the scale.

### **Mood profile at four time points for the comparison study**

The preceding six graphs presented the T-scores for the six mood states for the MNNU mothers, PNW mothers and the NNU mothers by intervention groups. We need now to consider the mothers mood profile at the four individual time points, around the time of their baby's discharge home and at one, two and three months following their baby's discharge home. Therefore we will now proceed to the supporting tables where any significant differences will be identified between the mood scores for the MNNU mothers

and the PNW mothers for the comparison study and between the NNU mothers in the intervention groups for the randomised controlled trial.

For the comparison study, the following tables show the mood profile mean and standard deviation T-scores for the MNNU mothers and the PNW mothers recorded around the time their baby was discharged home and at one, two and three months after discharge. The differences between the two groups of mothers were derived from *t*-tests of the equality of means.

**Mood states around the time of discharge home for the matched neonatal unit mothers and the postnatal ward mothers**

***Comparison study***

Table 36 shows the mean and standard deviation T-scores for the MNNU mothers and the PNW mothers recorded around the time their baby was discharged home.

**Table 36 Mood state T-scores for the matched neonatal unit mothers and the postnatal ward mothers at the time of discharge (n=50)**

Mood state	Matched neonatal unit mothers n=28		Postnatal ward mothers n=22		Difference in means <i>p</i> -values
	mean	(sd)	mean	(sd)	
<b>Composed-Anxious</b>	50.64	(10.08)	55.13	(10.64)	<b>0.13</b>
<b>Agreeable-Hostile</b>	50.19	(10.44)	53.26	(9.19)	<b>0.28</b>
<b>Elated-Depressed</b>	52.21	(9.60)	55.51	(8.90)	<b>0.22</b>
<b>Confident-Unsure</b>	51.05	(10.87)	54.35	(8.20)	<b>0.24</b>
<b>Energetic-Tired</b>	50.15	(8.38)	54.15	(11.09)	<b>0.15</b>
<b>Clear headed-Confused</b>	50.59	(10.19)	52.95	(10.24)	<b>0.42</b>

Table 36 shows the mean T-scores at the time of discharge for the MNNU mothers and the PNW mothers. The T-scores were all lower for the MNNU mothers than the PNW mothers which indicated the MNNU mothers felt more negative in all six mood dimensions than the PNW mothers. However, the differences between the groups of mothers were small and not significant for any mood state.

**Mood states at one month after discharge home for the matched neonatal unit mothers and the postnatal ward mothers**

***Comparison study***

Table 37 shows the T-scores for the MNNU mothers and the PNW mothers recorded at one month following their baby's discharge home.

**Table 37 Mood state T-scores for the matched neonatal unit mothers and the postnatal ward mothers at one month after discharge (n=50)**

Mood state	Matched neonatal unit mothers n=28		Postnatal ward mothers n=22		Difference in means p-values
	mean	(sd)	mean	(sd)	
<b>Composed-Anxious</b>	52.21	(9.27)	48.72	(12.45)	0.26
<b>Agreeable-Hostile</b>	50.97	(9.15)	49.52	(12.05)	0.64
<b>Elated-Depressed</b>	51.73	(9.35)	49.38	(12.02)	0.44
<b>Confident-Unsure</b>	52.59	(8.49)	48.98	(13.49)	0.28
<b>Energetic-Tired</b>	51.29	(7.45)	51.46	(11.16)	0.95
<b>Clear headed-Confused</b>	52.02	(8.75)	49.81	(13.54)	0.51

Table 37 shows the mood state T-scores for the MNNU mothers and the PNW mothers at one month after their baby's discharge home. The table shows that a major change in mood state occurred in both groups at this time point. The MNNU mothers improved on five out of six mood states whilst the PNW mothers deteriorated on all the mood scales compared with the scores recorded around the time of discharge. However, the differences in mood between the MNNU mothers and PNW mothers were not significant for any mood state.

**Mood states two months after discharge home for the matched neonatal unit mothers and the postnatal ward mothers**

***Comparison study***

Table 38 shows the mood state T-scores for the MNNU mothers and the PNW mothers recorded at two months following their baby's discharge home.

**Table 38 Mood state T-scores for the matched neonatal unit mothers and the postnatal ward mothers at two months after discharge (n=50)**

Mood state	Matched neonatal unit mothers n=28		Postnatal ward mothers n=22		Difference in means p-values
	mean	(sd)	mean	(sd)	
<b>Composed-Anxious</b>	51.09	(9.60)	50.44	(10.76)	0.82
<b>Agreeable-Hostile</b>	48.83	(10.05)	50.99	(12.13)	0.50
<b>Elated-Depressed</b>	50.38	(9.90)	51.79	(8.51)	0.60
<b>Confident-Unsure</b>	50.56	(10.01)	53.09	(8.72)	0.35
<b>Energetic-Tired</b>	48.44	(9.72)	54.85	(8.71)	0.02
<b>Clear headed-Confused</b>	50.61	(10.22)	52.64	(10.09)	0.49

Table 38 shows the mood state T-scores for the MNNU mothers and the PNW mothers at two months following their baby's discharge home. The MNNU mothers were significantly less energetic than the PNW mothers ( $p=0.02$ ), however this may have been a chance finding as there were no other significant differences between the MNNU and PNW mothers for any other mood state.

**Mood states three months after discharge home for the matched neonatal unit mothers and the postnatal ward mothers**

**Comparison study**

The mood state T-scores for the MNNU mothers and the PNW mothers recorded at three months following their baby's discharge home are given in table 39.

**Table 39 Mood state T-scores for the matched neonatal unit mothers and the postnatal ward mothers at three months after discharge (n=50)**

Mood state	Matched neonatal unit mothers n=28		Postnatal ward mothers n=22		Difference in means <i>p</i> -values
	mean	(sd)	mean	(sd)	
<b>Composed-Anxious</b>	51.93	(9.14)	48.14	(13.49)	0.27
<b>Agreeable-Hostile</b>	52.08	(6.80)	47.27	(14.84)	0.17
<b>Elated-Depressed</b>	52.32	(8.37)	48.16	(13.61)	0.22
<b>Confident-Unsure</b>	52.49	(9.80)	49.71	(12.98)	0.39
<b>Energetic-Tired</b>	50.55	(9.59)	51.28	(12.57)	0.82
<b>Clear headed-Confused</b>	51.84	(9.20)	48.39	(14.92)	0.35

Table 39 shows the mood state T-scores for the MNNU mothers and the PNW mothers at three months after their baby's discharge home. Although the scores for the MNNU mothers were mostly higher than the scores for the PNW mothers, the differences were small and not significant for any of the mood states.

Therefore we have seen the achievement of **objective (vii) – to discover the level of mood states of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers who were discharged home following standard postnatal care.**

The findings showed that, when measured by the POMS-Bi, the matched NNU mothers were significantly less energetic than the PNW mothers at two months following their baby's discharge home ( $p=0.02$ ). However, this was probably a chance finding as there

were no other significant differences between the matched NNU mothers and the PNW mothers for any other mood state.

We can therefore conclude that there were no significant differences between mood profiles of the matched NNU mothers and the PNW mothers at the time of their baby's discharge home and at one, two and three months following discharge.

### **Mood profile at four time points for the randomised controlled trial**

The following tables show the mood profile mean and standard deviation T-scores for the NNU mothers recorded around the time their baby was discharged home and at one, two and three months following discharge. The findings of the NNU mothers are presented by intervention group. We will recall that the mothers in group A received the 'Baby Helpline' and 'Baby Check' interventions, group B received 'Baby Helpline', group C received 'Baby Check' and the mothers in group D received neither intervention. Differences between the intervention groups, presented as *p*-values, were derived from analysis of variance.

### **Mood states around the time of discharge home for the neonatal unit mothers**

#### ***Randomised controlled trial***

Table 40 shows the mean and standard deviation T-scores for the NNU mothers recorded around the time of their baby's discharge home.

**Table 40      Mood state T-scores for the neonatal unit mothers at discharge by intervention group (n=110)**

Mood state	Group A n=32	Group B n=26	Group C n=24	Group D n=28	Difference in means <i>p</i> -value
	mean (sd)	mean (sd)	mean (sd)	mean (sd)	
<b>Composed-Anxious</b>	48.47 (8.08)	47.11 (10.83)	49.72 (9.64)	50.64 (10.08)	<b>0.57</b>
<b>Agreeable-Hostile</b>	48.11 (10.76)	50.80 (10.11)	48.44 (8.88)	50.19 (10.44)	<b>0.71</b>
<b>Elated-Depressed</b>	48.33 (10.11)	46.61 (10.22)	48.26 (9.08)	52.21 (9.60)	<b>0.19</b>
<b>Confident-Unsure</b>	47.46 (8.84)	47.72 (11.58)	50.64 (9.16)	51.05 (10.87)	<b>0.41</b>
<b>Energetic-Tired</b>	48.22 (7.31)	48.90 (12.71)	49.60 (10.22)	50.15 (8.38)	<b>0.88</b>
<b>Clear headed-Confused</b>	48.65 (9.50)	48.82 (11.06)	49.69 (9.20)	50.59 (10.19)	<b>0.88</b>

Table 40 shows the mood state T-scores for the NNU mothers recorded around the time of their baby's discharge home by intervention group. There were no significant differences between the intervention groups.

### **Mood states one month after discharge home for the neonatal unit mothers**

#### ***Randomised controlled trial***

Table 41 shows the mood state T-scores for the NNU mothers recorded at one month after their baby's discharge home by intervention group.

**Table 41 Mood states T-scores for neonatal unit mothers at one month after discharge by intervention group (n=110)**

Mood state	Group A n=32	Group B n=26	Group C n=24	Group D n=28	Difference in means <i>p</i> -value
	mean (sd)	mean (sd)	mean (sd)	mean (sd)	
<b>Composed-Anxious</b>	48.21 (8.34)	51.83 (9.47)	49.00. (10.91)	52.21 (9.27)	<b>0.28</b>
<b>Agreeable-Hostile</b>	47.49 (8.89)	52.77 (8.25)	49.66 (11.80)	50.97 (9.15)	<b>0.20</b>
<b>Elated-Depressed</b>	48.04 (9.05)	52.11 (8.36)	48.88 (11.54)	51.73 (9.35)	<b>0.29</b>
<b>Confident-Unsure</b>	48.07 (8.52)	50.61 (9.91)	49.83 (9.97)	52.59 (8.49)	<b>0.30</b>
<b>Energetic-Tired</b>	48.13 (8.67)	50.53 (11.46)	49.08 (11.69)	51.29 (7.45)	<b>0.61</b>
<b>Clear headed-Confused</b>	48.68 (9.08)	50.18 (8.80)	49.38 (10.43)	52.02 (8.75)	<b>0.55</b>

Table 41 shows the mood state T-scores for NNU mothers at one month after their baby's discharge home by intervention group. There were no significant differences between the intervention groups.

### **Mood states two months after discharge home for the neonatal unit mothers**

#### ***Randomised controlled trial***

Table 42 shows the mood state T-scores for the NNU mothers at two months following their baby's discharge home by intervention group.

**Table 42** Mood state T-scores for the neonatal unit mothers at two months after discharge by intervention group (n=110)

Mood state	Group A n=32	Group B n=26	Group C n=24	Group D n=28	Difference in means <i>p</i> -value
	mean (sd)	mean (sd)	mean (sd)	mean (sd)	
<b>Composed-Anxious</b>	48.72 (9.26)	51.51 (9.05)	48.39 (11.91)	51.09 (9.60)	<b>0.56</b>
<b>Agreeable-Hostile</b>	48.97 (10.08)	50.89 (8.07)	50.87 (10.19)	48.83 (10.05)	<b>0.77</b>
<b>Elated-Depressed</b>	48.82 (10.14)	50.96 (10.61)	48.45 (10.90)	50.38 (9.90)	<b>0.78</b>
<b>Confident-Unsure</b>	48.32 (10.42)	50.76 (9.49)	47.93 (10.94)	50.56 (10.01)	<b>0.65</b>
<b>Energetic-Tired</b>	48.76 (9.65)	52.31 (10.02)	46.52 (10.41)	48.44 (9.72)	<b>0.22</b>
<b>Clear headed-Confused</b>	49.85 (9.74)	50.76 (8.78)	46.25 (10.95)	50.61 (10.22)	<b>0.34</b>

Table 42 shows the mood state T-scores for the NNU mothers at two months following their baby's discharge home by intervention group. There were no significant differences between the intervention groups.

### **Mood states three months after discharge home for the neonatal unit mothers**

#### ***Randomised controlled trial***

Table 43 show the mood state T-scores for the NNU mothers at three months following their baby's discharge home by intervention group.

**Table 43 Mood state T-scores for the neonatal unit mothers at three months after discharge by intervention group (n=110)**

Mood state	Group A n=32	Group B n=26	Group C n=24	Group D n=28	Difference in means p-value
	mean (sd)	mean (sd)	mean (sd)	mean (sd)	
<b>Composed-Anxious</b>	48.88 (9.84)	51.39 (7.68)	49.43 (9.93)	51.93 (9.14)	<b>0.53</b>
<b>Agreeable-Hostile</b>	49.16 (7.94)	50.71 (10.13)	50.43 (10.19)	52.08 (6.80)	<b>0.64</b>
<b>Elated-Depressed</b>	49.01 (8.51)	50.77 (10.92)	49.46 (8.88)	52.32 (8.37)	<b>0.52</b>
<b>Confident-Unsure</b>	48.03 (8.62)	50.34 (9.29)	49.62 (9.78)	52.49 (9.80)	<b>0.33</b>
<b>Energetic-Tired</b>	48.39 (8.93)	50.33 (9.82)	49.98 (9.97)	50.55 (9.59)	<b>0.81</b>
<b>Clear headed-Confused</b>	49.48 (8.85)	51.05 (6.92)	48.89 (9.99)	51.84 (9.20)	<b>0.59</b>

Table 43 shows the mood state T-scores for the NNU mothers at three months following the baby's discharge home by intervention group. There were no significant differences between the intervention groups.

Therefore we have seen the achievement of **objective (xii) – to determine the effect of 'Baby Helpline' and 'Baby Check' on the mood states of mothers who had their baby discharged from a neonatal unit.**

The findings showed that, when measured by the POMS-Bi scale, there were no significant differences in mood states of NNU mothers between any of the intervention groups at any time point.

We can conclude therefore that access to 'Baby Helpline' and or 'Baby Check' had neither a positive nor a negative effect on the mood states of mothers around the time of their baby's discharge home from a NNU or at one, two or three months following their baby's discharge home.

Having considered the mood profile of mothers at four discrete time points, we will now progress to the findings on the magnitude of mood change over time.

### **Magnitude of change in the mood over time**

If we refer back to figures 7-12 we can see from the pattern of mood change for each mood state, that the magnitude of change in mood was greater for some mothers than others. The greatest change in the moods of mothers appeared to occur between their baby's discharge home and one month after discharge. Therefore we will now consider the magnitude of change in the mood states of mothers between the scores at one and three months following their baby's discharge home from the score achieved at the baseline recorded around the time of the baby's discharge home.

When considering the magnitude of change in mood over time it was important to remember that the mothers with the greatest change in their mood states were not necessarily more positive (or negative) in their mood than other mothers but that they experienced greater change in their mood over time. Changes in mood states were therefore relative.

The change in mood state was explored for the MNNU mothers and PNW mothers in relation to the comparison study and the NNU mothers in relation to the RCT. The differences between the groups of mothers were calculated by *t*-tests for the comparison study and analysis of variance for the RCT.

#### **Change in mood at one month after discharge for the matched neonatal unit mothers and the postnatal ward mothers**

##### ***Comparison study***

The magnitude of change in mood states of the MNNU mothers and PNW mothers recorded at one month after their baby's discharge home from the scores recorded around the time of the baby's discharge home are shown in table 44.

**Table 44 Change in mood states at one month after discharge from the baseline scores for the matched neonatal unit mothers and the postnatal ward mothers (n=50)**

Mood state	Matched neonatal mothers n=28		Postnatal ward mothers n=22		Difference in means p-values
	mean	(sd)	mean	(sd)	
<b>Composed-Anxious</b>	1.58	(12.17)	-6.42	(11.49)	<b>0.02</b>
<b>Agreeable-Hostile</b>	0.79	(13.20)	-3.74	(9.83)	<b>0.19</b>
<b>Elated-Depressed</b>	-0.47	(11.46)	-6.14	(9.02)	<b>0.06</b>
<b>Confident-Unsure</b>	1.54	(11.20)	-5.36	(11.26)	<b>0.04</b>
<b>Energetic-Tired</b>	1.14	(10.35)	-2.69	(8.66)	<b>0.17</b>
<b>Clear headed-Confused</b>	1.43	(12.73)	-3.14	(9.20)	<b>0.16</b>

Table 44 shows the change in mood states at one month following discharge from the baseline score for the MNNU mothers and the PNW mothers. The MNNU mothers made a relative improvement for all mood states, that is they became more positive in their moods, than indicated at the time of their baby's discharge home, except on the elated-depressed mood where they showed a relative deterioration over time. In contrast, the PNW mothers made a negative change for all the mood states. These findings indicated that the PNW mothers felt relatively less composed, less agreeable, less elated, less confident, less energetic and less clear headed at one month after discharge home than they indicated around the time of their baby's discharge home. The differences between the MNNU mothers mostly positive mood change and the PNW mothers negative mood change were significant for the mood dimensions of composed-anxious ( $p=0.02$ ) and confident-unsure ( $p=0.04$ ).

#### **Change in mood at three months after discharge for the matched neonatal unit mothers and the postnatal ward mothers**

##### **Comparison study**

The change in mood states for the MNNU mothers and the PNW mothers at three months following their baby's discharge home from the baseline scores recorded around the time of discharge home are shown in table 45.

**Table 45 Change in mood states at three months after discharge from the baseline scores for the matched neonatal unit mothers and postnatal ward mothers (n=50)**

Mood state	Matched neonatal unit mothers n=28		Postnatal ward mothers n=22		Difference in means <i>p</i> -values
	mean	(sd)	mean	(sd)	
<b>Composed-Anxious</b>	1.30	(12.78)	-6.99	(12.92)	<b>0.03</b>
<b>Agreeable-Hostile</b>	1.89	(12.56)	-5.99	(13.51)	<b>0.04</b>
<b>Elated-Depressed</b>	0.12	(10.07)	-7.35	(11.92)	<b>0.02</b>
<b>Confident-Unsure</b>	1.44	(13.47)	-4.64	(13.80)	<b>0.12</b>
<b>Energetic-Tired</b>	0.40	(12.24)	-2.87	(14.75)	<b>0.40</b>
<b>Clear headed-Confused</b>	1.26	(12.80)	-4.56	(12.73)	<b>0.12</b>

Table 45 shows the change in the six mood states of the MNNU mothers and the PNW mothers recorded at three months following the baby's discharge home from the baseline score recorded around the time of their baby's discharge. The change in mood for all six mood states was positive for the MNNU mothers in contrast to the completely negative

change in the mood profile for the PNW mothers. The differences between the MNNU mothers and the PNW mothers were significant for the composed-anxious ( $p=0.03$ ), agreeable-hostile ( $p=0.04$ ) and elated-depressed ( $p=0.02$ ) mood dimensions.

We have therefore seen the achievement of **objective (viii) – to discover the extent of change in mood states over time of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers who were discharged home following standard postnatal care.**

When measured by the POMS-Bi scale, the change in mood states recorded around the time of their baby's discharge home and one month after discharge, showed mainly positive mood change for the matched NNU mothers and negative mood change for the PNW mothers. These differences were significant for the composed-anxious ( $p=0.02$ ) and confident-unsure ( $p=0.04$ ) mood dimensions.

The change in mood that occurred at three months after their baby's discharge home from the baseline mood recorded around the time of their baby's discharge home was positive mood change for the matched NNU mothers and negative mood change in the PNW mothers. Differences in the magnitude of the mothers' mood change were significant for the composed-anxious ( $p=0.03$ ) agreeable-hostile ( $p=0.04$ ) and elated-depressed ( $p=0.02$ ) mood dimensions.

We can therefore conclude that there were significant differences in the magnitude of mood change experienced by mothers who had their baby discharged home from a NNU and mothers who were discharged home with their baby following standard postnatal care. The direction of significant mood change was positive for the matched NNU mothers and negative for the PNW mothers.

### **Mood change in the neonatal unit mothers**

The magnitude of change in mood states for the NNU mothers at one, two or three months following their baby's discharge home from the baseline scores obtained at the time of their baby's discharge showed that there were no significant differences between the intervention groups. Therefore only the mothers' change in mood states between the time of their baby's discharge home and three months following discharge and the effect on the change in mood over time of receiving or not receiving an intervention are presented.

## Change in mood at three months after discharge for the neonatal unit mothers

### ***Randomised controlled trial***

The magnitude of change in mood for the NNU mothers at three months from the baseline scores recorded around the time of their baby's discharge home by intervention group is shown in table 46.

**Table 46 Change in mood states at three months after discharge from the baseline scores for the neonatal unit mothers by intervention group (n=110)**

Mood state	Group A n=32	Group B n=26	Group C n=24	Group D n=28	Difference in means <i>p</i> -value
	mean (sd)	mean (sd)	mean (sd)	mean (sd)	
<b>Composed-Anxious</b>	0.41 (11.20)	4.27 (10.67)	-0.29 (11.01)	1.30 (12.78)	<b>0.50</b>
<b>Agreeable-Hostile</b>	1.05 (10.17)	-0.095 (14.02)	1.99 (9.48)	1.89 (12.56)	<b>0.91</b>
<b>Elated-Depressed</b>	0.67 (11.71)	4.16 (13.65)	1.20 (11.22)	0.12 (10.07)	<b>0.59</b>
<b>Confident-Unsure</b>	0.57 (11.55)	2.62 (13.73)	-1.02 (9.91)	1.44 (13.47)	<b>0.76</b>
<b>Energetic-Tired</b>	0.17 (10.55)	1.44 (15.53)	0.38 (10.65)	0.40 (12.24)	<b>0.98</b>
<b>Clear headed-Confused</b>	0.83 (11.66)	2.23 (13.80)	-0.80 (10.66)	1.26 (12.80)	<b>0.85</b>

Table 46 shows the change in mood for the NNU mothers at three months from the baseline scores recorded around the time of their baby's discharge home by intervention group. The direction of change was mostly positive. There were however negative changes for the mothers who received 'Baby Helpline' (group B) on the agreeable-hostile mood dimension and the mothers who received 'Baby Check' (group C) on the composed-anxious, confident-unsure and clear headed-confused mood dimensions. However, there were no significant differences between the intervention groups in the magnitude of mood change over time.

## Change in mood at three months after discharge for the neonatal unit mothers with and without access to an intervention

### ***Randomised controlled trial***

The effect on the change in mood over time of receiving or not receiving an intervention is shown in table 47.

Table 47 Change in mood states for mothers who received any intervention and mothers who received no intervention (n=110)

Time since discharge	Group	Composed-Anxious (sd)	Agreeable-Hostile (sd)	Elated-Depressed (sd)	Confident-Unsure (sd)	Energetic-Tired (sd)	Clear headed-Confused (sd)
1 month	<b>Any intervention n=82</b>	-0.11 (11.26)	-0.03 (11.04)	0.57 (12.55)	-0.24 (10.47)	-0.20 (10.62)	-0.33 (11.51)
	<b>No intervention n=28</b>	0.33 (12.75)	0.08 (13.39)	-1.68 (11.77)	0.69 (11.43)	0.59 (10.69)	0.96 (13.28)
2 months	<b>Difference between groups</b>	<b>p=0.86</b>	<b>p=0.97</b>	<b>p=0.41</b>	<b>p=0.69</b>	<b>p=0.73</b>	<b>p=0.62</b>
	<b>Any intervention n=82</b>	0.19 (11.67)	0.63 (11.66)	0.90 (12.55)	0.25 (11.53)	0.55 (11.15)	0.02 (12.07)
3 months	<b>No intervention n=28</b>	-0.54 (11.10)	-1.84 (13.35)	-2.63 (10.41)	-0.73 (12.31)	-1.61 (11.84)	-0.05 (12.81)
	<b>Difference between groups</b>	<b>p=0.77</b>	<b>p=0.35</b>	<b>p=0.18</b>	<b>p=0.70</b>	<b>p=0.39</b>	<b>p=0.98</b>
	<b>Any intervention n=82</b>	0.01 (11.74)	-0.32 (11.99)	0.41 (12.80)	-0.24 (12.09)	0.06 (12.82)	-0.19 (12.85)
	<b>No intervention n=28</b>	-0.30 (13.59)	0.93 (13.09)	-1.21 (10.52)	0.70 (13.78)	-0.17 (12.86)	0.55 (13.71)
	<b>Difference between groups</b>	<b>p=0.99</b>	<b>p=0.65</b>	<b>p=0.55</b>	<b>p=0.73</b>	<b>p=0.94</b>	<b>p=0.80</b>
	Any intervention= mothers in groups A, B and C						

No intervention= mothers in group D.

Table 47 shows that even when all the mothers who received an intervention were combined and compared with the mothers who did not receive an intervention there were no significant differences in the magnitude of mood change at one, two or three months after their baby was discharged from a NNU.

We have therefore seen the fulfilment of **objective (xiii) – to determine the effect of ‘Baby Helpline’ and ‘Baby Check’ on the change in mood states over time of mothers who had their baby discharged from a neonatal unit.**

The findings showed that, when measured by the POMS-Bi, there were no significant differences between the NNU mothers in the intervention groups for the change in mood states at one, two and three months following their baby's discharge home from the mood states around the time of their baby's discharge home.

We can therefore conclude that neither ‘Baby Helpline’ nor ‘Baby Check’ had a positive or negative effect on the change in mood states of mothers who had their baby discharged from a NNU.

## **SYNOPSIS OF CHAPTER NINE**

This chapter has comprehensively described the mood states of the matched NNU mothers and the PNW mothers in relation to the comparison study (part 2) and the NNU mothers in relation to the RCT. Mood was measured by the POMS-Bi standardised inventory.

There were significant differences between the mood states of new mothers and the mood states of the normal British adult. The finding that new mothers were significantly less energetic than other adults was not surprising, as feeling profoundly tired appears to be a common feature of early motherhood. However, mothers who had their baby discharged home from a NNU showed positive differences from the normal values over a longer period of time and over a wider range of mood states than the PNW mothers.

In the comparison study, the MNNU mothers were significantly less energetic than the PNW mothers at two months following their baby's discharge home. However, this was probably a chance finding as there were no other significant differences between the

MNNU mothers and the PNW mothers for any other mood state at the time of their baby's discharge home or at one, two or three months following discharge.

The change in mood states recorded around the time of their baby's discharge home and one month after discharge showed mainly positive mood change for the MNNU mothers and negative mood change for the PNW mothers. These differences were significant for the composed-anxious and confident-unsure mood dimensions.

The change in mood at three months after their baby's discharge home from the baseline mood recorded around the time of their baby's discharge home was positive mood change for the MNNU mothers and negative mood change in the PNW mothers. Differences in the magnitude of the mothers' mood change were significant for the composed-anxious agreeable-hostile and elated-depressed mood dimensions.

In the RCT, there were no significant differences in mood states between the NNU mothers in any of the intervention groups therefore access to 'Baby Helpline' and or 'Baby Check' had neither a positive nor a negative effect on the mood states of mothers at one, two or three months following their baby's discharge home.

The magnitude of mood change in mothers at one, two and three months following their baby's discharge from a NNU from the mood states recorded around the time of their baby's discharge were not significantly increased or decreased by access to 'Baby Helpline' or 'Baby Check'. In addition, there were no significant differences in the magnitude of mood change between all the mothers who received an intervention combined and the mothers who did not receive an intervention.

Having evaluated the effect of 'Baby Helpline' and 'Baby Check' on the anxiety and mood states of mothers following their baby's discharge from a NNU, the following two chapters will consider the characteristics of the NNU mothers which influenced their anxiety and mood states.

## **CHAPTER TEN**

### **MAIN STUDY FINDINGS** **CHARACTERISTICS THAT INFLUENCED ANXIETY** **IN NEONATAL UNIT MOTHERS**

#### **THE AIM OF THIS CHAPTER**

This chapter will present the findings of the investigation into the mother and baby characteristics that significantly influenced anxiety, which was measured by the Spielberger State-Trait Anxiety Inventory (STAI). The findings related to the 194 neonatal unit (NNU) mothers who completed the trait-anxiety and the state-anxiety scale at two time points. Only characteristic variables significant at the 5% level will be presented.

#### **Objectives of the investigation into the characteristics that influenced anxiety**

The objectives addressed by these findings were:-

**objective (iii) - to identify the mothers' characteristics that were associated with anxiety in mothers who had their baby discharged from a neonatal unit.**

**objective (iv) - to identify the mothers' characteristics that were associated with the change in anxiety over time of mothers who had their baby discharged from a neonatal unit.**

#### **CHARACTERISTICS OF NEONATAL UNIT MOTHERS THAT INFLUENCED ANXIETY**

##### **Characteristics that influenced trait-anxiety**

The characteristics that influenced trait-anxiety in the NNU mothers were identified by analysis of variance and regression for continuous variables and are shown in table 48.

**Table 48 Characteristics that influenced trait-anxiety in neonatal unit mothers (n=194)**

Characteristics	Effect on trait-anxiety score	p-value
<b>Maternal age *</b>	-0.29	<b>0.02</b>
<b>Marital status-married/living with partner</b>	-5.64	<b>0.01</b>
<b>Marital status-not married/living with partner</b>	baseline group	
<b>Qualifications</b>		<b>0.05</b>
no qualifications	0.01	
GCSE/O Level	0.67	
A Level	-0.74	
Higher Ed/Degree	-3.62	
Vocational	-6.04	
Other	baseline group	

\* = continuous variable

Table 48 shows that the characteristics that significantly influenced trait-anxiety in the NNU mothers were age, marital status and educational attainment on leaving full time education. Every increasing year of age was associated with a decrease of 0.29 points on the trait-anxiety scale ( $p=0.02$ ). Mothers who were married or lived with their partner were less anxious by 5.64 points on the trait-anxiety scale than other NNU mothers ( $p=0.01$ ). Educational attainment on leaving full time education showed a trend for mothers with higher and vocational qualifications to have less of a propensity for anxiety than other mothers ( $p=0.05$ ).

#### **Characteristics that influenced anxiety at the time of discharge**

The significant characteristics that influenced state-anxiety for the NNU mothers around the time of their baby's discharge home are shown in table 49.

**Table 49 Characteristics that influenced anxiety in neonatal unit mothers at the time of their baby's discharge home (n=194)**

Characteristics	Effect on first State-anxiety score	p-value
<b>Mothering experience</b>	-4.0	<b>p=0.02</b>
First-time mothers	baseline group	
<b>Maternal age</b>	-0.3	<b>p=0.05</b>

Table 49 shows that mothering experience and age significantly influenced anxiety in NNU mothers around the time of their baby's discharge from a NNU. Women with previous mothering experience were less anxious by 4 points on the scale compared with first-time mothers ( $p=0.02$ ). In addition, with every increasing year of age, mothers showed a reduction in the first state-anxiety score of 0.3 per year ( $p=0.05$ ).

Intuitively, we might have expected to find increased anxiety in mothers who had delivered the earliest and/or smallest babies or in those who had not experienced a normal delivery. There were however no significant effects demonstrated on anxiety by delivery of a baby at 32 or less weeks of gestation and/or 1.5Kg or less birth weight ( $p=0.66$ ) or by delivery type ( $p=0.61$ ).

We have therefore seen the fulfilment of **objective (iii) - to identify the mothers' characteristics that were associated with anxiety in mothers who had their baby discharged from a neonatal unit.**

The findings showed that trait-anxiety was significantly influenced by maternal age with every increasing year of age associated with a decrease in trait-anxiety ( $p=0.02$ ). Mothers who were married or lived with their partner had a lower trait-anxiety than other mothers ( $p=0.01$ ) and educational attainment on leaving full time education showed a trend for mothers with higher and vocational qualifications to have a lower trait-anxiety ( $p=0.05$ ).

Neonatal unit mothers with previous mothering experience ( $p=0.02$ ) and increasing maternal age ( $p=0.05$ ) were significantly less anxious than the other NNU mothers around the time of their baby's discharge home.

Therefore we can conclude that neonatal unit mothers who were older, married or lived with their partner and those with higher or vocational qualifications had a significantly lower propensity for anxiety than other neonatal unit mothers. We can also conclude that mature mothers and mothers with previous baby care experience were significantly less anxious than other neonatal unit mothers around the time of their baby's discharge home.

### **Characteristics that influenced the change in anxiety between two time points**

#### **Characteristics identified by univariate analysis**

It will be recalled that the NNU mothers decreased in their anxiety over time. To identify the characteristics of the NNU mothers that significantly influenced the change in anxiety that had occurred between the time of the baby's discharge home and anxiety at three months after discharge, univariate or single characteristic analysis was undertaken. The effect of trait-anxiety on the magnitude of change between the two state-anxiety measurements was also investigated. The change in anxiety was adjusted for trait-anxiety to exclude a baseline

effect caused by the high trait-anxiety as previously described. The findings are shown in table 50.

**Table 50 Characteristics of neonatal unit mothers that influenced the change in anxiety between two time points (n=194)**

<b>Characteristics</b>	<b>Effect on change in anxiety between first and second state-anxiety score</b>	<b>Effect on change in anxiety between first and second state-anxiety score adjusted for trait-anxiety</b>
<b>First-time mother</b>	-4.3 ( $p=0.02$ )	<b>-5.2 (<math>p=0.02</math>)</b>
Previous mothering experience	baseline group	baseline group
<b>Delivery type</b>	( $p=0.004$ )	<b>(<math>p=0.004</math>)</b>
Caesarean section-general anaesthetic	1.6 ( $p=0.52$ )	2.2 ( $p=0.35$ )
Caesarean section-epidural	-5.9 ( $p=0.006$ )	-5.5 ( $p=0.009$ )
Forceps/Ventouse	-6.2 ( $p=0.06$ )	-6.0 ( $p=0.06$ )
Normal delivery	baseline group	baseline group

Table 50 shows the characteristics of the NNU mothers that significantly influenced the magnitude of change in their anxiety between their baby's discharge home and three months following discharge. In general terms, the mothers who had a higher trait-anxiety showed greater improvement or positive change in anxiety over time.

For first-time mothers, the decrease in anxiety was greater by 4.3 points on the anxiety scale compared with those who had previous mothering experience ( $p=0.02$ ). When the change in anxiety was adjusted for trait-anxiety the decrease in anxiety for first-time mothers was 5.2 points greater on the scale than more experienced mothers ( $p=0.02$ ).

Delivery type had an overall significant effect on the magnitude of change in anxiety ( $p=0.004$ ). When trait-anxiety was added to the model, delivery type remained significant ( $p=0.004$ ). The change in anxiety over time for mothers who delivered their baby by Caesarean section under epidural was 5.9 points less anxious on the scale than mothers who had a normal delivery ( $p=0.006$ ). When trait-anxiety was added to the model, the decrease in anxiety was 5.5 points more for mothers who had a Caesarean section under epidural than for mothers who had a normal delivery ( $p=0.009$ ).

As stated earlier, when interpreting change in anxiety over time it is important to remember that the magnitude of change in anxiety is relative to the initial level of anxiety. However, for the NNU mothers, there was no significant difference in the first state-anxiety scores for

Caesarean section under epidural and normal vaginal delivery, therefore the change in anxiety seen was most likely due to the type of delivery and not attributable to a different starting level of anxiety.

### **Characteristics identified by multivariate analysis**

As many of the characteristics of the mothers and babies were inter-related, analysis of multivariate or the combined characteristics of the NNU mothers that significantly influenced the change in anxiety between the two state-anxiety measurements was also undertaken. However, the only significant variable detected was delivery type ( $p=0.004$ ). The results were therefore identical to those found for delivery type in the univariate analysis and are not repeated.

Therefore we have also seen the fulfilment of **objective (iv) - to identify the mothers' characteristics that were associated with the change in anxiety over time of mothers who had their baby discharged from a neonatal unit.**

Univariate analysis of the characteristics of the NNU mothers that significantly influenced the magnitude of change over time in anxiety found that first-time mothers decreased in their anxiety significantly more than experienced mothers, with and without adjustment for trait-anxiety ( $p=0.02$ ). Delivery type also influenced the positive change in anxiety over time ( $p=0.004$ ). Mothers who delivered their baby by Caesarean section under epidural showed a significantly greater reduction in anxiety than mothers who had a normal delivery ( $p=0.006$ ), which persisted when the change in anxiety was adjusted for trait-anxiety ( $p=0.009$ ).

Mutivariate analysis of the characteristics of the NNU mothers that influenced the change in anxiety over time found delivery type to be the only significant variable ( $p=0.004$ ). The results were therefore identical to those found for delivery type in the univariate analysis.

We can therefore conclude that the magnitude of change in anxiety was greatest for first-time mothers and mothers who had an epidural Caesarean section compared with other mothers.

## **SYNOPSIS OF CHAPTER TEN**

This chapter has presented the findings on the characteristics of NNU mothers that influenced their anxiety.

In NNU mothers the propensity for anxiety was significantly less as mothers increased in age at childbirth and in mothers who were married or lived with their partner or attained higher or vocational qualifications compared with other mothers.

Anxiety experienced around the time of their baby's discharge home was significantly less in mothers as their age increased and in mothers with previous mothering experience compared with first-time mothers. The magnitude of change in anxiety was greatest for first-time mothers and mothers who had an epidural Caesarean section compared with other mothers.

The following chapter will present the findings of the investigation into the characteristics of the NNU mothers that influenced their mood states.

## **CHAPTER ELEVEN**

### **MAIN STUDY FINDINGS**

#### **CHARACTERISTICS THAT INFLUENCED THE MOOD STATES OF NEONATAL UNIT MOTHERS**

##### **THE AIM OF THIS CHAPTER**

The aim of this chapter is to present the findings of the analysis into the mother and baby characteristics that significantly influenced the mood of the 110 NNU mothers who completed the Profile of Mood States-Bi-Polar Form (POMS-Bi) on four occasions.

##### **Objectives of the investigation into the characteristics that Influenced mood**

The objectives addressed by these findings were:-

**objective (v) – to identify the mothers' characteristics that were associated with the mood states of mothers who had their baby discharged from a neonatal unit.**

**objective (vi) - to identify the mothers' characteristics that were associated with change in mood states over time of mothers who had their baby discharged from a neonatal unit.**

##### **CHARACTERISTICS OF THE NEONATAL UNIT MOTHERS AND THEIR MOOD STATES**

###### **Characteristics identified by univariate analysis**

###### **Influences on the mothers' mood at the time of their baby's discharge**

The mother and baby characteristics of the NNU mothers that influenced their mood states around the time of their baby's discharge home are presented in table 51. Analysis of characteristics that influenced the POMS-Bi scores were obtained by analysis of variance and regression for continuous variables. Only characteristic variables significant at the 5% level will be presented.

**Table 51 Characteristics that influenced the mood states of the neonatal unit mothers at the time of their baby's discharge home (n=110)**

Maternal and baby characteristic	Composed-Anxious	Agreeable-Hostile	Elated-Depressed	Confident-Unsure	Energetic-Tired	Clear headed-Confused
Maternal age	✓ <i>p=0.04</i>					
Mothering experience	✓ <i>p&lt;0.001</i>			✓ <i>p&lt;0.001</i>	✓ <i>p=0.001</i>	✓ <i>p&lt;0.001</i>
Adverse obstetric history	✓ <i>p=0.04</i>					
Delivery type				✓		
Birth weight	✓ <i>p=0.03</i>	✓ <i>p=0.04</i>	✓ <i>p=0.04</i>	✓ <i>p=0.009</i>	✓ <i>p=0.001</i>	✓ <i>p=0.001</i>
Gestation at birth	✓ <i>p=0.02</i>			✓ <i>p=0.04</i>	✓ <i>p=0.002</i>	✓ <i>p=0.003</i>
Birth at 32 wks gestation or less &/ 1.5Kg or less birth weight	✓ <i>p=0.007</i>		✓ <i>p=0.04</i>	✓ <i>p=0.04</i>	✓ <i>p=0.007</i>	✓ <i>p=0.007</i>
Length of stay					✓ <i>p=0.03</i>	
Discharge weight	✓ <i>p=0.01</i>	✓ <i>p=0.04</i>	✓ <i>p=0.04</i>	✓ <i>p=0.03</i>	✓ <i>p=0.001</i>	✓ <i>p=0.001</i>

✓ = characteristic that significantly influenced the mood state

Table 51 shows mother and baby characteristics that significantly influenced the mood profile of the NNU mothers around the time of their baby's discharge home. The significant characteristics were:-

#### **Influence of maternal age**

Older mothers scored higher on the agreeable-hostile scale and were therefore significantly more agreeable ( $p=0.04$ ) than younger mothers.

#### **Influence of mothering experience**

Women with previous mothering experience were significantly more composed ( $p<0.001$ ), more confident ( $p<0.001$ ), more energetic ( $p=0.001$ ) and more clear headed ( $p<0.001$ ) compared with first-time mothers.

#### **Influence of adverse obstetric history**

Mothers with experience of adverse obstetric events were significantly more composed ( $p=0.04$ ) at the time of their baby's discharge home than mothers who had not previously experienced adverse obstetric events.

#### **Influence of delivery type**

Mothers who had a normal vaginal delivery were significantly more energetic ( $p=0.001$ ) than mothers who had more intervention based types of delivery such as Caesarean section or forceps/Ventouse deliveries.

#### **Influence of birth weight**

Mothers who had lower birth weight babies were significantly more composed ( $p=0.03$ ), more elated ( $p=0.04$ ), more confident ( $p=0.009$ ), more energetic ( $p=0.001$ ) and more clear headed ( $p=0.003$ ) than mothers who had a baby with a higher birth weight.

#### **Influence of gestation at birth**

Mothers who delivered their baby at a lower gestation were significantly more composed ( $p=0.02$ ), more confident ( $p=0.04$ ), more energetic ( $p=0.002$ ) and more clear headed ( $p=0.007$ ) than mothers who gave birth to gestationally more mature babies.

### **Influence of birth at 32 or less weeks gestation and/or 1.5Kg or less birth weight**

Mothers who delivered early and small babies were significantly more composed ( $p=0.007$ ), more elated ( $p=0.04$ ), more confident ( $p=0.04$ ) and more clear headed ( $p=0.03$ ) compared with mothers of more mature and/or larger babies.

### **Influence of length of stay**

Mothers of babies who stayed longer on the NNU were significantly more energetic ( $p=0.001$ ) and more clear headed ( $p<0.001$ ) compared with mothers whose baby had a shorter duration of stay.

### **Influence of discharge weight**

Mothers who took home their baby at a lower discharge weight were significantly more composed ( $p=0.01$ ), more elated ( $p=0.04$ ), more confident ( $p=0.03$ ), more energetic ( $p=0.008$ ) and more clear headed ( $p=0.001$ ) than mothers whose baby weighed more at discharge.

Therefore we have seen the fulfilment of **objective (v) – to identify the mothers' characteristics that were associated the mood states of mothers who had their baby discharged from a neonatal unit.**

The characteristics of the NNU mothers that influenced their mood states around the time of their baby's discharge home were:-

- maternal age
- mothering experience
- adverse obstetric history
- delivery type
- birth weight
- gestation at birth
- birth at 32 or less weeks gestation &/or 1.5Kg or less birth weight
- length of stay
- discharge weight

Therefore we can conclude that the profile of mood states of NNU mothers around the time of their baby's discharge home were significantly influenced by a combination of mother and baby characteristics. However, we will recall that birth weight and gestation at birth are highly correlated and are also inter-dependent with both length of stay and discharge weight.

## **CHARACTERISTICS OF NEONATAL UNIT MOTHERS THAT INFLUENCED THE CHANGE IN MOOD BETWEEN THEIR BABY'S DISCHARGE HOME AND THREE MONTHS FOLLOWING DISCHARGE**

### **Characteristics identified by univariate analysis**

The mother and baby characteristics of the NNU mothers that significantly influenced the magnitude change in the six mood states from the time of their baby's discharge home to one and three months following discharge were investigated using univariate or single characteristic analysis. The characteristics of the NNU mothers that influenced the change in mood between discharge and one month following discharge are reported in Appendix 21. The characteristics of the NNU mothers that influenced the change in mood between their baby's discharge home and their mood three months following discharge are shown in table 52, Only characteristic variables significant at the 5% level are presented.

**Table 52** Characteristics that influenced the change in mood states of the neonatal unit mothers between their baby's discharge home and three months after discharge (n=110)

Characteristics	Composed-Anxious	Agreeable-Hostile	Elated-Depressed	Confident-Unsure	Energetic-Tired	Clear headed-Confused
<b>Mothering experience</b>				✓ <i>p=0.02</i>	✓ <i>p=0.02</i>	✓ <i>p=0.04</i>
<b>Delivery type</b>	✓ <i>p=0.02</i>	✓ <i>p=0.006</i>	✓ <i>p=0.008</i>	✓ <i>p=0.001</i>	✓ <i>p=0.004</i>	✓ <i>p=0.04</i>
<b>Birth weight</b>	✓ <i>p=0.04</i>		✓ <i>p=0.04</i>	✓ <i>p=0.003</i>	✓ <i>p=0.004</i>	✓ <i>p=0.001</i>
<b>Gestation at birth</b>				✓ <i>p=0.02</i>	✓ <i>p=0.007</i>	✓ <i>p=0.002</i>
<b>Birth at 32 or less weeks gestation &amp;/or 1.5Kg or less birth weight</b>				✓ <i>p=0.02</i>	✓ <i>p=0.05</i>	✓ <i>p=0.005</i>
<b>Length of stay</b>				✓ <i>p=0.02</i>	✓ <i>p=0.01</i>	✓ <i>p=0.05</i>
<b>Discharge weight</b>						✓ <i>p=0.01</i>

✓ = characteristic that significantly influenced the mood state

Table 52 shows the mother and baby characteristics that significantly influenced the change in mood states for the NNU mothers between the time of their baby's discharge home and three months following discharge were:-

### **Influence of mothering experience**

First-time mothers showed a significantly greater positive change in mood and were relatively more confident ( $p=0.02$ ), more energetic ( $p=0.004$ ), and more clear headed ( $p=0.04$ ) compared with the change in mood seen in more experienced mothers at three months following their baby's discharge than they reported around the time of their baby's discharge home.

### **Influence of delivery type**

Mothers who had forceps/Ventouse deliveries or Caesarean section under epidural showed significantly greater improvement in mood than mothers who had a normal delivery. They were relatively more composed ( $p=0.02$ ), more agreeable ( $p=0.006$ ), more elated ( $p=0.008$ ), more confident ( $p=0.001$ ), more energetic ( $p=0.004$ ) and more clear headed ( $p=0.001$ ) at three months following discharge than they indicated around the time of their baby's discharge home. However, the mothers who delivered by Caesarean section under general anaesthetic became worse on the mood scales than mothers who had a normal delivery but this did not reach statistical significance.

### **Influence of birth weight**

As birth weight increased, the change in mood was significantly improved and mothers were relatively more composed ( $p=0.04$ ), more elated ( $p=0.04$ ), more confident ( $p=0.003$ ), more energetic ( $p=0.007$ ) and more clear headed ( $p=0.002$ ) three months after discharge home than they indicated at the time of their baby's discharge.

### **Influence of gestation at birth**

The earlier gestation at which the baby was born the more negative the change in moods of mothers. The earlier the baby was born, mothers were less confident ( $p=0.02$ ), less energetic ( $p=0.05$ ) and less clear headed ( $p=0.005$ ) at three months after discharge than they reported around the time of their baby's discharge home.

### **Influence of birth at 32 or less weeks gestation and/or 1.5Kg or less birth weight**

Mothers who delivered the earliest and lightest babies improved significantly less on the mood scales compared with mothers who delivered more mature and/or heavier babies. Their change in mood between discharge and three months was relatively less clear headed ( $p=0.05$ ) compared with mothers who delivered more mature and/or heavier babies.

### **Influence of length of stay**

The change in mood for mothers with a baby who stayed in the NNU for 7 days or less was more confident ( $p=0.02$ ), more energetic ( $p=0.01$ ) and more clear headed ( $p<0.001$ ) than all the other NNU mothers at three months following discharge than they indicated around the time of their baby's discharge home.

### **Influence of discharge weight**

The higher the baby's discharge weight, the greater the improvement in mood at three months following discharge than the mothers indicated around the time of their baby's discharge home and these mothers were relatively more clear head ( $p=0.01$ ).

It will be recalled that many of the characteristics that influenced the change in mood states over time identified by this univariate analysis are highly correlated and inter-related therefore a multivariate analysis to identify the significant characteristics.

### **Characteristics identified by multivariate analysis**

A multivariate model was used to investigate the interrelationship of characteristics on the magnitude of change in the mood states of the NNU mothers between the time of their baby's discharge home and three months following discharge and the findings are shown in table 53.

The multivariate model was used with and without inclusion of the baseline score, recorded around the time of the baby's discharge home, to exclude a baseline effect on the magnitude of mood change. Therefore, if significant values persisted with the baseline score included in the model, the significant change found between the two time points was likely to be due to a change in mood rather than a change from the baseline score. Only variables significant at the 5% level are reported.

**Table 53** Multivariate analysis of the characteristics that influenced the change in mood of the neonatal unit mothers between their baby's discharge home and three months following discharge (n=110)

Characteristics	Effect on mood change between the scores at discharge & the scores at 3 months	Effect on mood change between scores at discharge & the scores at 3 months including baseline score
<b>COMPOSED-ANXIOUS MOOD STATE</b>		
<b>Delivery type</b>	<b>p=0.02</b>	
Caesarean section-G.A.	-5.4 (p=0.11)	
Caesarean section-epidural	2.6 (p=0.34)	
Forceps/Ventouse	6.9 (p=0.08)	
Normal vaginal delivery	baseline group	
<b>AGREEABLE-HOSTILE MOOD STATE</b>		
<b>Delivery type</b>	<b>p=0.006</b>	<b>p=0.001</b>
Caesarean section-G.A.	-3.5 (p=0.3)	-6.5 (p=0.01)
Caesarean section-epidural	7.0 (p=0.01)	3.6 (p=0.10)
Forceps/Ventouse	4.4 (p=0.26)	1.9 (p=0.54)
Normal vaginal delivery	baseline group	baseline group
<b>ELATED-DEPRESSED MOOD STATE</b>		
<b>Delivery type</b>	<b>p=0.008</b>	<b>p=0.01</b>
Caesarean section-G.A.	-6.6 (p=0.05)	-5.6 (p=0.04)
Caesarean section-epidural	3.3 (p=0.23)	2.3 (p=0.29)
Forceps/Ventouse	5.9 (p=0.13)	4.0 (p=0.19)
Normal vaginal delivery	baseline group	baseline group
<b>CONFIDENT-UNSURE MOOD STATE</b>		
<b>First-time mother</b>	<b>6.5 (p=0.006)</b>	
Experienced mother	baseline group	
<b>Gestation at birth</b>	<b>p=0.02</b>	
24-29 weeks	-13.7 (p=0.004)	
30-32 weeks	-4.8 (p=0.16)	
33-37 weeks	-6.6 (p=0.05)	
38-39 weeks	0.7 (p=0.86)	
40+ weeks	baseline group	
<b>Delivery type</b>	<b>p=0.007</b>	<b>p=0.01</b>
Caesarean section-G.A.	-8.4 (p=0.01)	-4.8 (p=0.08)
Caesarean section-epidural	1.9 (p=0.48)	2.9 (p=0.19)
Forceps/Ventouse	2.5 (p=0.54)	4.9 (p=0.12)
Normal vaginal delivery	baseline group	baseline group

(table 53 continued over page)

Table 53 *continued*

Multivariate analysis of the characteristics that influenced the change in mood of the neonatal unit mothers between their baby's discharge home and three months following discharge (n=110)

Characteristics	Effect on mood change between the scores at discharge & the scores at 3 months	Effect on mood change between scores at discharge & the scores at 3 months including baseline score
<b>ENERGETIC-TIRED MOOD STATE</b>		
First-time mother	5.2 ( $p=0.03$ )	
Experienced mother	baseline group	
<b>Delivery type</b>	<b><math>p=0.04</math></b>	
Caesarean section-G.A.	-1.9 ( $p=0.58$ )	
Caesarean section-epidural	5.1 ( $p=0.08$ )	
Forceps/Ventouse	8.3 ( $p=0.04$ )	
Normal vaginal delivery	baseline group	
<b>CLEAR HEADED-CONFUSED MOOD STATE</b>		
First-time mother	5.1 ( $p=0.04$ )	
Experienced mother	baseline group	
<b>Gestation at birth</b>	<b><math>p=0.007</math></b>	
24-29 weeks	-16.2 ( $p=0.001$ )	
30-32 weeks	-10.0 ( $p=0.006$ )	
33-37 weeks	-8.5 ( $p=0.02$ )	
38-39 weeks	-3.5 ( $p=0.39$ )	
40+ weeks	baseline group	
<b>Delivery type</b>	<b><math>p=0.006</math></b>	<b><math>p=0.03</math></b>
Caesarean section-G.A.	-6.9 ( $p=0.04$ )	-4.0 ( $p=0.14$ )
Caesarean section-epidural	4.6 ( $p=0.11$ )	3.7 ( $p=0.11$ )
Forceps/Ventouse	1.3 ( $p=0.75$ )	4.0 ( $p=0.22$ )
Normal vaginal delivery	baseline group	baseline group

G. A. = general anaesthetic

Table 53 shows the findings of the multivariate analysis that examined the interrelationship between multiple characteristics of the NNU mothers that significantly influenced their change in mood over time. When the baseline score, recorded around the time of the baby's discharge home, was added to the model, this indicated a highly significant negative change in mood ( $p<0.001$ ) for all six mood states. Therefore the higher or more positive the mothers score at discharge, the smaller the change in mood at three months after discharge home. The mother and baby characteristics that significantly influenced the change in the mood states of the NNU mothers between the time of the baby's discharge home and three months following discharge were:-

### **Influences on the composed-anxious mood state**

Overall delivery type was significant for the change in the composed-anxious mood dimension ( $p=0.02$ ). Mothers who had a Caesarean section under general anaesthetic became more anxious whilst mothers who had a forceps/Ventouse delivery became more composed compared with mothers who had a normal delivery.

### **Influences on the agreeable-hostile mood state**

The significant change in the agreeable-hostile mood dimension ( $p=0.006$ ) indicated that mothers who delivered their baby by epidural Caesarean section improved on the scale by 7 points and became more agreeable compared with mothers who had a normal vaginal delivery. However, when the baseline reading was included in the model the only significant change was demonstrated by mothers who had a Caesarean section under general anaesthetic who changed by 6.5 point towards being less agreeable ( $p=0.01$ ) compared with mothers who had a normal delivery.

### **Influences on the elated-depressed mood state**

Delivery type remained significant for the change between the elated-depressed scores recorded at three months after discharge from the scores recorded at the time of the baby's discharge home ( $p=0.008$ ). Mothers who delivered their baby by Caesarean section under general anaesthetic became worse by 6.6 points on the elated-depressed scale compared with those who had a normal vaginal delivery ( $p=0.05$ ). This change in mood remained significant when the baseline score was added to the model ( $p=0.04$ ).

### **Influences on the confident-unsure mood state**

The change in mood for first-time mothers improved by 6.5 points more than experienced mothers on the confident-unsure scale ( $p=0.006$ ).

Gestation at birth remained significant for the change in the confident-unsure scale ( $p=0.02$ ) The earlier the baby was born the more negative was the direction of change for their mother compared with births at 40 or more weeks of gestation. Mothers who gave birth between 24-29 weeks and 33-37 weeks of gestation changed negatively by 13.7 points ( $p=0.004$ ) and 6.6 points ( $p=0.05$ ) respectively and were relatively less confident at three months than their scores indicated around the time of their baby's discharge home compared with those mothers who gave birth at 40 or more weeks of gestation.

Delivery type significantly influenced the change in the confident-unsure mood dimension ( $p=0.007$ ). Mothers who delivered by Caesarean section under general anaesthetic became less confident with a 8.4 point negative change compared with mothers who had a normal vaginal delivery.

### **Influences on the energetic-tired mood state**

First-time mothers changed towards more energetic and improved by 5.2 points compared with more experienced mothers ( $p=0.03$ ).

Delivery type remained significant for the change in the energetic-tired mood dimension ( $p=0.04$ ). Mothers who had a forceps/Ventouse delivery increased on the scale by 8.3 points and changed towards more energetic compared with those who had a normal vaginal delivery.

### **Influences on the clear headed-confused mood state**

First-time mothers improved by 5.1 points and showed a greater positive change on the clear headed-confused mood scale compared with more experienced mothers ( $p=0.04$ ).

Gestation at birth remained significant on the clear headed-confused mood dimension ( $p=0.007$ ). The negative direction of change increased with decreasing gestation but was only significant for those who delivered a premature baby compared with mothers of babies born at 40 or more weeks of gestation. Mothers who delivered their baby at 24-29 weeks of gestation decreased by 16.2 points ( $p=0.001$ ), 30-32 weeks decreased by 10 points ( $p=0.006$ ), 33-37 weeks decreased by 8.5 points ( $p=0.02$ ) towards the confused pole of the scale at three months than their scores indicated around the time of their baby's discharge home compared with mothers who delivered their baby at 40 or more weeks of gestation.

Delivery type remained significant for the change in the clear headed-confused mood dimension ( $p=0.006$ ). Mothers who delivered by Caesarean section under general anaesthetic decreased by 6.9 points on the scale towards being less clear headed than mothers who had a normal vaginal delivery ( $p=0.04$ ). However, this significance did not persist when the baseline score was included in the model.

Therefore we have seen the fulfilment of **objective (vi) - to identify the mothers' characteristics that were associated the change in mood states over time of mothers who had their baby discharged from a neonatal unit.**

Univariate analysis identified the significant mother and baby characteristics that influenced the magnitude of change in the mood states of NNU mothers between the time their baby was discharged home and three months following discharge. The significant variables were:-

- mothering experience
- delivery type
- birth weight
- gestation at birth
- 32 or less weeks gestation and/or 1.5Kg or less birth weight
- length of stay
- discharge weight

However, birth weight and gestation at birth are highly correlated variables and are both inter-dependent on length of stay and discharge weight. Therefore multivariate analysis was undertaken to investigate the interrelationship of these characteristics and their effect on the change in the mood states of the NNU mothers.

Multivariate analysis of the characteristics of the NNU mothers that significantly influenced the change in mood between the time of their baby's discharge home and three months following discharge home were mothering experience, gestation at birth and delivery type.

Compared with normal delivery, Caesarean section under general anaesthetic was significant for the negative mood change seen in the elated-depressed, confident-unsure and clear headed-confused mood dimensions. Significant positive mood change was influenced by epidural Caesarean section for the agreeable-hostile mood state and forceps/Ventouse deliveries for the energetic-tired mood state. The significant influence of delivery type on the composed-anxious mood state was not specific.

Increasing prematurity was significantly responsible for increasing negative mood change in the confident-unsure and clear headed-confused mood dimensions.

Compared with other mothers, first-time mothers showed significantly positive mood change on the confident-unsure, energetic-tired and clear headed-confused mood dimensions and probably represents 'catch up' with the moods of more experienced mothers.

Therefore we can conclude that the characteristics of the NNU mothers that significantly influenced the change in their mood profile between the time of their baby's discharge home and three months following discharge were delivery type, gestation at birth and mothering experience.

### **SYNOPSIS OF CHAPTER ELEVEN**

This chapter has presented the findings of the investigation into the characteristics of NNU mothers that influenced their mood states.

The characteristics that significantly influenced the mood profile of the NNU mothers around the time of their baby's discharge from a NNU were identified as a range of inter-related and inter-dependent mother and baby characteristics. Multivariate analysis found the characteristics that significantly influenced the change in the mood profile of the NNU mothers between the time of their baby's discharge home and three months following discharge were mothering experience, gestation at birth and delivery type.

The findings of the comparison study (part 1) and the findings of the main study presented in Chapters Seven, Eight, Nine, Ten and Eleven will be discussed in relation to the literature in Chapter Twelve.

## **CHAPTER TWELVE**

### **DISCUSSION**

#### **THE AIM OF THIS CHAPTER**

The purpose of this chapter is to discuss the results of the comparison study (part 1) and the main study collectively in relation to the literature described in the Rationale chapter of this thesis. The aim is to identify areas where this study confirms, contradicts or clarifies issues raised in previous research and contributes to new knowledge. Based on the findings of this research and the discussion in relation to other research, this chapter will also include recommendations for practice and future research.

#### **THE MOTHERS IN THIS STUDY**

It will be recalled that this study related to all mothers who had their baby discharged from a NNU rather than the more frequent focus on the mothers of pathological groups such as premature, low birth weight or very low birth weight babies (McHaffie, 1989; Miles, 1989; McHaffie, 1990; Rajan and Oakley, 1990; Gennaro et al. 1990; Brooten et al. 1991; McKim, 1993a; McKim, 1993b; Stjernqvist, 1996). As well as the mothers of premature and low birth weight babies, this study population therefore also included the mothers of term, well grown babies whose health was compromised around the time of their birth and required admission to a NNU. The emotional and physical experiences of these mothers of term babies were not therefore thought to be analogous with the mothers of term, healthy babies (Ball, 1994; Weaver and Ussher, 1997; Woollett and Parr, 1997).

For most mothers the birth of their baby is a positive, life-enhancing event. In contrast, admission of a newborn baby to a NNU has been described as a life crisis event for parents. Studies, from as long ago as the 1960s (Caplan, 1960; Kaplan and Mason, 1960; Caplan et al. 1965; Benfield et al. 1976) describe parents, especially mothers, as experiencing many emotional losses and high levels of stress and anxiety in response to this crisis. The emotional, psychological and physical environment of the NNU imposes many stressors on parents (Miles and Carter, 1983; Miles, 1989; Perehudoff, 1990; Affleck et al. 1990a; Affonso et al. 1992; Shields-Poë and Pinelli, 1997). The circumstances which surrounded the birth and, typically, the unexpected admission to a NNU, may disrupt adaptation to motherhood and the mothers' perception of their ability to care for their baby (Redshaw, 1997). Therefore, following their baby's admission to a NNU, new mothers are

likely to experience an enormous amount of anxiety, stress and distress and be in great need of support and understanding whilst their baby is in a NNU. However two issues arise, firstly to what extent does the need for extra support extend beyond discharge from the NNU? Secondly, to what extent are mothers who had their baby discharged from a NNU different from other new mothers? Some of the literature would suggest that the negative impact on mothers of admission to a NNU persists long after their baby has recovered and has been discharged home (Brooten et al. 1988; McHaffie, 1990; Gennaro et al. 1990; McKim, 1993a; Stjernqvist, 1996; Harrison and Magill-Evans, 1996; Miles et al. 1999) whilst other literature is less unequivocal (Crnic et al. 1983; Gennaro, 1985; Gennaro, 1988; Redshaw, 1997).

The purpose of this thesis was therefore to evaluate, through a randomised controlled trial (RCT), the effect of specific support interventions on the anxiety and mood of mothers who had their baby discharged from a NNU. In addition, to identify the characteristics of the NNU mothers that influenced their anxiety and mood. This thesis also sought, through a comparison study, to discover the extent of differences between mothers who had their baby discharged from a NNU and mothers who received standard postnatal care and were discharged home with their baby from a PNW. Where the literature does not refer specifically to this homogeneous group of 'NNU mothers' the findings of this study will be related to the most appropriate literature available.

## **DID THE RCT SHOW THAT THE INTERVENTIONS WERE EFFECTIVE?**

### **The effect of 'Baby Helpline' and 'Baby Check' on anxiety**

With regard to anxiety the two objectives of the RCT were:-

- to determine the effect of 'Baby Helpline' and 'Baby Check' on anxiety of mothers who had their baby discharged from a neonatal unit.**
  
- to determine the effect of 'Baby Helpline' and 'Baby Check' on the change in anxiety over time of mothers who had their baby discharged from a neonatal unit.**

The findings related to anxiety were derived from the first RCT of a telephone helpline and of 'Baby Check' specifically with mothers who had their baby discharged from a NNU and were therefore new observations that had not previously been described in the literature.

In this study, the trait-anxiety in the NNU mothers was significantly higher, indicating a greater propensity for anxiety, than the normal value for women of a similar age given by Spielberger et al. (1983). However, there was no significant difference in the trait-anxiety between the mothers in the four trial arm groups of the RCT.

The NNU mothers became less anxious over time. These findings confirm the findings of Gennaro et al. (1990) and Brooten et al. (1988) who found mothers of preterm, low birth weight and very low birth weight infants discharged from a NNU showed a decrease in anxiety over time. However, unlike this study, Gennaro et al. (1990) and Brooten et al. (1988) did not provide additional support interventions after discharge. In this present study, when measured by the Spielberger State Trait Anxiety Inventory (STAI) access to 'Baby Helpline' and or 'Baby Check' made no significant difference to the state-anxiety of mothers, with and without adjustment for trait-anxiety at three months following their baby's discharge from a NNU. Although access to the interventions did not decrease anxiety it is also important to note that anxiety was not significantly increased. These findings specifically address concerns expressed in a paper by Wright (1996) regarding the unknown effect of 'Baby Check' on the anxiety of mothers.

There was also no significant difference between the trial arm groups of mothers for the magnitude of change in their anxiety from the level of anxiety recorded around the time of their baby's discharge from a NNU and the level of anxiety recorded three months following discharge. The similarity in the magnitude of change in anxiety for the mothers persisted with and without adjustment for trait-anxiety.

Although this study showed that the decrease in anxiety over time was greater for the mothers who received an intervention compared with the mothers who did not receive an intervention, the difference was not significant. Therefore we can conclude that access to an additional support intervention was not responsible for the decrease in anxiety over time.

When comparing anxiety in mothers who had their baby discharged from a NNU with other populations of women, difficulty arises through the lack of normative values for postnatal women. Brooten (1988) and Gennaro (1988) also noted this lack of specific comparable values. However, in this present study internal comparisons of anxiety were made, therefore the lack of specific normative values would not effect the interpretation of the results of the RCT.

Although the NNU mothers in this study were significantly more prone to anxiety than the cited normal value for women of a similar age, their trait-anxiety appeared to be consistent with the trait-anxiety found in studies of new mothers by Hunfeld et al. (1997) and Green and Kafetsios (1997) and by Statham and Green (1994) in pregnant women following a previous unsuccessful pregnancy and Shields-Poë and Pinelli (1997) in a study of variables associated with parental stress in neonatal intensive care units.

The exploration of anxiety in this study appears to have been more comprehensive than in some other studies. In contrast to the findings presented in this study, Hunfeld et al. (1997), Green and Kafetsios (1997) and Statham and Green (1994) did not report state-anxiety with and without adjustment for trait-anxiety even though trait-anxiety was reported. Shields-Poë and Pinelli (1997) reported the expected positive correlation that mothers with higher trait-anxiety scores had higher state-anxiety scores. In addition, in this present study the assessment of anxiety in mothers who had their baby discharged from a NNU was located in reality rather than the hypothetical post discharge scenarios used by Consolvo (1984). Also in contrast to this study, other studies that used an objective measure of anxiety in relation to motherhood, such as Green and Kafetsios (1997), did not report the magnitude of change in anxiety over time.

In summary therefore, the new evidence which emerged from this RCT indicated that in mothers who had their baby discharged from a NNU, irrespective of their trait-anxiety, access to 'Baby Helpline' and or 'Baby Check' neither increased nor decreased their anxiety at three months following their baby's discharge home or the magnitude of change in their anxiety over time.

### **The effect of 'Baby Helpline' and 'Baby Check' on mood**

Having looked at anxiety we will now consider the two objectives of the RCT which related to mood states which were:-

**- to determine the effect of 'Baby Helpline' and 'Baby Check' on the mood states of mothers who had their baby discharged from a neonatal unit.**

**- to determine the effect of 'Baby Helpline' and 'Baby Check' on the change in mood states over time of mothers who had their baby discharged from a neonatal unit.**

The findings related to mood were derived from the first RCT of a telephone helpline and 'Baby Check' specifically with mothers who had their baby discharged home from a NNU and were therefore new observations that had not previously been described.

This study showed that, when measured by the Profile of Mood States-Bipolar Form (POMS-Bi), the mood profile of the NNU mothers was generally significantly more negative at the time of their baby's discharge from a NNU, or baseline, than the mood profile of other British adults (Bartram et al. 1991). However, there were no significant differences in the mood profile of the mothers in the four trial groups of the RCT recorded around the time of their baby's discharge home from a NNU.

Access to 'Baby Helpline' and or 'Baby Check' showed there were no significant differences in mood between any of the trial arm groups of mothers at one, two or three months following their baby's discharge. Although the findings showed that access to 'Baby Helpline' and or 'Baby Check' did not improve mood it is also important to note that mood was not significantly decreased by access to the interventions.

The mood profile of the mothers improved over time. There were no significant differences between the mothers in the trial arm groups for the magnitude of change in their mood at one, two or three months following their baby's discharge home from their mood recorded at the time of their baby's discharge.

In order to explore the effect of access to the interventions further, the mothers who received any intervention were combined and compared with the mothers who received no intervention. Even though the mood profile of the mothers was relatively low around the time their baby was discharged from the NNU, there was no significant difference in the magnitude of mood change at one, two or three months following discharge between the mothers who received an additional support intervention and the mothers who did not. Therefore we can conclude that access to an additional support intervention was not responsible from the improvement in mood over time.

To explore the concept of mood from the widest possible perspective, this study reported on six, bi-polar mood dimensions. This was in contrast to other studies that have considered mood in mothers following their baby's discharge from a NNU by Jeffcoate (1980), Gennaro (1988), Brooten et al. (1988) and Gennaro et al. (1990) which focused only on depression or McKim (1993a) and Redshaw (1997) who reported on confidence.

Studies of mood and the transition to motherhood by Anderson et al. (1994) and mood change in pregnancy by Koltyn (1994) also only reported on the mood state of depression. Green and Kafetsios (1997), in their study of positive experiences of early motherhood described 'mood' only in terms of trait-anxiety and depression.

Previous evaluations of telephone helplines or 'Baby Check' have not objectively reported on mood states as an outcome. Thornton et al. (1990) reported that almost half of the mothers who participated in field trials of 'Baby Check' found it reassuring and Kai (1994) found mothers who used 'Baby Check' reported that it increased their confidence and offered them moral support. Stewart et al. (1994) reported four out of twelve NNU mothers described 'Baby Check' as reassuring to go home with. However, these are descriptive evaluations and no other mood dimensions have been reported. As previously stated, there is scant objective evidence in the literature of the effect on mood states of telephone helplines on their target populations although studies (Farquhar, 1989; Hirst, 1989; Angel et al. 1990; O'Donovan, 1993) describe reassurance in users of the service.

In summary therefore, the new evidence which emerged from this RCT indicated that in mothers who had their baby discharged from a NNU, access to 'Baby Helpline' and or 'Baby Check' neither increased nor decreased their mood states at one, two or three months following their baby's discharge home. In addition, access to 'Baby Helpline' and or 'Baby Check' showed no evidence of effect on the magnitude of mood change over time of mothers following their baby's discharge from a NNU.

### **Conclusions about the effectiveness of the interventions**

The findings of the RCT showed that access to 'Baby Helpline' and or 'Baby Check' neither increased nor decreased the anxiety or mood states, or the magnitude of change over time of the anxiety or mood states of mothers who had their baby discharged from a NNU. However, the numbers of mothers in the study were small and the findings that access to 'Baby Helpline' and or 'Baby Check' showed no evidence of effect on anxiety or mood states should be treated with caution.

### **Unexpected results**

The finding that 'Baby Helpline' and 'Baby Check' showed no evidence of effect on the anxiety and mood profile of mothers following their baby's discharge from a NNU was unexpected. It will be recalled that there is a vast amount of literature on the crisis which surrounds premature birth and admission to a NNU (Caplan, 1960; Kaplan and Mason,

1960; Caplan et al. 1965; Benfield et al. 1976; Miles and Carter, 1983; Miles, 1989).

Although studies by Brooten et al. (1988), Gennaro (1988) and Gennaro et al. (1990) showed anxiety and depression in mothers of preterm and low birth weight babies decreased over time the effect of support interventions was expected to enhance emotional recovery.

Redshaw (1997) in a study of mothers of babies who required admission to a NNU, found their experiences had affected their attitudes and their perception of their ability to care for their baby. She also found the mothers of the smaller, sicker babies were more worried and less confident about taking their baby home from a NNU. In addition, the evidence that mothers find being at home with their baby following discharge from the NNU difficult (McHaffie, 1989; McHaffie, 1990; Kenner and Wright Lott, 1990; Gennaro et al. 1990; McKim, 1993a; McKim, 1993b; May, 1997) would support the notion that additional support interventions were required and would be welcomed by mothers.

Although most of the literature relates to mothers of low birth weight or premature babies, there is no reason to suppose that the experience of admission to a NNU is any less of an emotional crisis for the mothers of well-grown, term babies who are sick in the perinatal period. Goldberg (1978) and Kenner and Wright Lott (1990) found that mothers of babies discharged from a NNU wanted specific and accurate information about their baby. It was therefore again surprising that access to additional support interventions that provided accurate information and would facilitate and enable mothers to make appropriate decisions about their baby's health care did not have a positive impact on their anxiety and mood states.

So, why did the interventions have no effect on the anxiety and mood profile of mothers following their baby's discharge from a NNU? In order to answer this question it is necessary to consider some possible factors which might have influenced the results of this research.

## **DID THE RESEARCH PROCESS INFLUENCE THE OUTCOME OF THE RCT?**

### **Methodological factors that may have influenced the outcome of the RCT**

In an attempt to understand why the interventions have no effect on the anxiety and mood of mothers it was necessary to explore if the research process had exerted an influence on the outcome of the RCT. The areas of the research process that required consideration

were the methodological factors related to the design of the study including issues related to the implementation of the research.

### **Was a randomised controlled trial an appropriate study design?**

A RCT is regarded as the most appropriate study design to evaluate health care interventions (Jadad, 1998). Assuming a study involves a sufficient number of participants, a RCT reduces the risk of imbalance between the study groups of unknown but important factors that could influence the outcome of the study. In this study the design was a factorial stratified blocked RCT. This RCT had a factorial design because the two interventions, 'Baby Helpline' and 'Baby Check', were evaluated separately and in combination against a control group of mothers who received neither intervention. The mothers were stratified by the presence or absence of previous mothering experience prior to being randomly allocated to one of the four trial arm groups. Approximately equal numbers of mothers in the four trial arm groups was achieved by blocking as described in the Chapter Three of this thesis.

Tarnow-Mordi and Healy (1999) highlighted the difference between 'no evidence of effect' and 'evidence of no effect' in RCTs. This distinction was based on the power of a study to show an effect of an intervention. The number of participants in each of the trial arm groups influences the power of a study. A retrospective power calculation based on the difference in the change in anxiety of the NNU mothers between the time of their baby's discharge home and anxiety recorded at three months after discharge between the mothers who received an intervention and mothers who did not receive an intervention (table 30) was undertaken. Assuming a statistical significance of  $p=0.05$ , this study was found to have a power of only 55% to detect the difference in change in anxiety found. Therefore the findings of this study that access to 'Baby Helpline' and or 'Baby Check' showed no evidence of effect on anxiety or mood states should be treated with caution.

Selecting for analysis only the mothers who completed the standardised inventories for anxiety and mood at all the time points effectively reduced the power of this study. This was necessary so that the magnitude of change in anxiety and mood over time could be calculated and the subsets of mothers used in the analysis of anxiety and mood were representative of the total group of NNU mothers. The randomisation and the factorial and blocked design of the RCT preserved some of the power of this study. The power could be improved if the study were repeated over a longer period of time, included more mothers (375 mothers would be needed to achieve 80% power and statistical significance of

$p=0.05$ ), by having fewer time periods so that the drop out rate would be less or by considering anxiety and mood states at fixed time points only rather than the change in anxiety and mood states over time.

The outcomes of this RCT would appear to be objective measures of anxiety and mood states using validated standardised inventories. Therefore the experimental design of a RCT appeared to be an entirely appropriate methodological approach for this study.

### **Was the evaluation method for 'Baby Helpline' appropriate?**

This study was the first RCT of the effect of a telephone helpline on its target population. It will be recalled that there is an increasing trend for health related telephone helplines to be established without comprehensive evaluation of their effectiveness. Most evaluations of telephone helplines confine themselves to reporting on the frequency and time of use, types of calls received, impact on other services and management or organisational issues (Nagle et al. 1992; Poole et al. 1993; Wilkins, 1993; Lattimer et al. 1998; Thompson et al. 1999; Munro et al. 2000). Helplines, some of which target specific diagnosis or carer groups frequently cite 'support' as one of their major aims. However, in contrast to this study, the effect of the support received is rarely evaluated and consumer perceptions are usually only reported in a few general statements (Farquhar, 1989; Hirst, 1989; Angel et al. 1990; O'Donovan, 1993). In addition, many evaluations only report on the effect of the helpline on actual users of the service and no account is taken of none users (Maisiak et al. 1989; Nagle et al. 1992; Crone et al. 1993). By definition the users of a telephone helpline are a self-selected group. This study evaluated the effect on anxiety and mood states of access to a telephone helpline in users and non-users rather than measuring effectiveness by the number of calls received. The inclusion of the non-users of 'Baby Helpline' in the analysis was therefore important, as the purpose of this study was to evaluate the effect on anxiety and mood of mothers' receiving a support intervention rather than an evaluation of the use of a telephone helpline. Therefore we have seen that this evaluation of the effect of 'Baby Helpline' appeared to be more robust and more specific than many other evaluations of telephone helplines reported in the literature.

### **Was the evaluation method for 'Baby Check' appropriate?**

This study was the first RCT of the effect of 'Baby Check' on the anxiety and mood states of mothers. In addition, with the exception of a short pilot study by Stewart et al. (1994) in New Zealand of only twelve families of babies discharged from a NNU, this was the first major study of 'Baby Check' with mothers who had their baby discharged from a NNU. In

contrast to the findings of no effect on anxiety and mood of this study, it will be recalled the evaluations based on mothers' perceptions of 'Baby Check' by Thornton et al. (1991) and Kai (1994) reported reduced or no increase in anxiety, increased confidence, moral support and reassurance. In this study the inclusion of the users and non-users of 'Baby Check' in the analysis was important, as the purpose of this study was to evaluate the effect on anxiety and mood of mothers' receiving a support intervention rather than an evaluation of the use of 'Baby Check'. Therefore we have seen that this evaluation of the effect of 'Baby Check' appeared to be more rigorous and considered a wider range of mood dimensions than previous evaluations reported in the literature.

### **Was there an effect from the researcher's clinical role?**

It will be recalled from Chapter One that the principal researcher in this study also has a part-time clinical role on the NNU. The aim of this role is to support parents by empowering them to regain a sense of control within their current situation through enhancing their access to appropriate information. This support is facilitated through a range of antenatal and postnatal hospital based individual contacts and group sessions that address information and support needs and NNU based support and information initiatives.

Gennaro et al. (1990) showed that anxiety and depression in mothers of low birth weight and very low birth weight babies reduced dramatically between birth and their baby's discharge home. The impact of the researcher's role is more likely to enhance the rate and level of the decrease in anxiety and improvement in mood of mothers prior to their baby's discharge home, and there were no differences between the mothers in the four trial arm groups at that time, rather than exert a post discharge effect on the anxiety or mood of mothers. It is possible therefore that the baseline (at the time of their baby's discharge home) anxiety was lower and mood higher in the mothers than they would have been without the researcher's clinical role. However, the researcher was no more likely to have had contact with the mothers from one of the trial arm groups than another and there were no significant differences in the baseline anxiety or mood between the mothers in the four trial arm groups. Therefore whatever level of influence was exerted by the clinical role of the researcher, it was equal across all four trial arm groups of mothers. Furthermore, the effect of the interventions was evaluated on internal comparisons of anxiety and mood over post discharge time.

### **Was the intervention period inappropriate?**

The end point of three months following their baby's discharge home from a NNU appeared to be an appropriate time for assessment of the mothers and similar periods had

been used in other studies (McHaffie, 1989; McHaffie, 1990; Gennaro et al. 1990). In addition, Wickberg-Johansson et al. (1996) and Cooper et al. (1988) suggested the critical period for the appearance of symptoms of low mood states associated with postnatal depression frequently occur within three months of delivery. Studies such as Padden and Glenn (1997) and Redshaw (1997), which used a shorter period post delivery or post discharge as the end point for assessment of anxiety or mood, risked assessing women still in the process of recovery from their crisis and still in transition to their new role.

### **Did the neonatal unit mothers bias the results of the RCT?**

It is possible that the mothers gave falsely positive responses on the inventories of anxiety and mood to give the impression that they had overcome the emotional adversities associated with their baby's admission to a NNU, and were now coping well and in control of their situation. Robson (1993) cautions researchers about this issue of subject bias. However, in this study, the risk of subject bias was minimised by the RCT methodology (Jadad, 1998), repeat testing and the balanced rating scales and scoring systems used by the anxiety and mood state inventories (Spielberger et al. 1983; Lorr and McNair, 1988). Therefore it was unlikely that subject bias influenced the results of the RCT.

### **Were the characteristics of the neonatal unit mothers unequally distributed?**

It will be recalled the mothers who participated in the RCT were randomly allocated to four trial arm groups. The mothers were not matched for any characteristic and were only stratified by the presence or absence of previous mothering experience. Therefore an imbalance of maternal or baby characteristics across the trial arm groups could bias the findings. In anticipation of the need to explore this issue an objective of this thesis was:-

- to discover if there were significant differences in the characteristics of mothers and babies within the four trial arm groups of the randomised controlled trial.**

The maternal characteristics tested for differences across the four trial arm groups of NNU mothers were age, educational attainment on leaving full time education, marital status, previous adverse obstetric events, delivery type, cigarette smoking, smoking during pregnancy, other household smokers, home tenure and access to a telephone.

The baby characteristics tested for differences across the trial arm groups of mothers were birth weight, gestation, birth at 32 or less weeks gestation and/or 1.5Kg or less birth weight, length of stay in the NNU and discharge weight.

The findings showed that there were no significant differences in the characteristics of mothers or babies between the four trial arm groups. In addition, the randomisation and stratification of mothers to the trial arm groups remained consistent within the groups of NNU mothers for whom anxiety and mood were analysed. Therefore the findings that access to 'Baby Helpline' and 'Baby Check' had no effect on anxiety or the mood of mothers who had their baby discharged from a NNU are not likely to be attributable to an imbalance of characteristics between the trial arm groups of the mothers.

### **Were the outcome measures appropriate?**

Another possible explanation for the findings that the interventions had no effect on the anxiety or mood of mothers who had their baby discharged from a NNU was that the choice of outcome measures may not have been appropriate or sensitive enough to detect change in their anxiety and mood states. However, this is unlikely as both the STAI and the POMS-Bi are well validated (Spielberger et al. 1983; Lorr and McNair, 1988). Furthermore, the anxiety measure used by Gennaro (1988) was validated against the STAI. Others have used the STAI and POMS with similar populations of women (Gennaro, 1985; Consolvo, 1986; Gennaro, 1988; Affleck et al. 1990a; Koltyn, 1994; Green and Kafetsios, 1997; Hunfeld et al. 1997; Shields-Poë and Pinelli, 1997).

There is an issue of concern that neither the STAI nor the POMS-Bi cite normal value ranges for postpartum mothers. In this study the interventions were evaluated on between-group differences and not differences from normal values. Therefore the lack of normal values for postnatal women should have no effect on the interpretation of these results.

Many studies of postnatal women report measures of depression. The adaptation to motherhood under 'normal' circumstances involves a diverse and complex range of emotions. When this adaptation occurs in sub-optimal conditions the effect on emotional health cannot be solely ascribed to 'depression' (Woollett and Parr, 1997). The postnatal experiences of mothers who had their baby discharged from a NNU were far removed from their 'normal' expectations. It therefore seemed appropriate to select a measure of mood, such as the POMS-Bi, which encompassed positive and negative dimensions of a range of mood states rather than just the presence or absence of depression.

Although the possibility exists that the outcome measures used in this study were inappropriate it appears unlikely, however other outcomes or other measures of anxiety or mood may have been equally appropriate.

**Did lack of promotion of the interventions affect their perceived value?**

Measures taken to avoid the risk of mothers acquiring access to interventions to which they had not been allocated, as described in Chapter Six, might have diminished the perceived value of the interventions for the mothers. The lack of overt promotion within the NNU by posters or discussion in parent groups might have given the erroneous impression that the interventions or the research initiative was not supported by the NNU.

Efforts to raise awareness amongst health visitors of the risks of contamination of the trial arm groups may also have resulted in their reluctance to discuss specific interventions with individual mothers. This may have given mothers the impression that the primary care team did not support the research project.

Following the baby's discharge home, the research team did not prompt or remind mothers to use 'Baby Helpline' or 'Baby Check' as this would reflect more closely the situation which would exist if the interventions were universally available following discharge from the NNU. However, prompting might have increased the compliance of mothers to complete and return the anxiety and mood questionnaires.

This research was undertaken before the advent of 'NHS Direct' when the prevailing climate was to discourage non-emergency, especially out-of hours telephone calls to GPs for health information. For most of the intervention period of this study the mothers would have ceased to have contact with a community midwife and health visitors are not traditionally available during evenings or weekends. An invitation to seek health information via the telephone may have been a new concept for many mothers that takes time to become the accepted practice as in other countries (Butts et al. 1988; Marklund and Bengtsson, 1989; Troutman et al. 1991; Wilkins, 1993).

It was also likely that local professional and community knowledge of 'Baby Check' was low as no primary health care team in the area routinely distributed 'Baby Check' to new mothers. Although the primary care team would have been familiar with 'Baby Check' from the professional literature and information related to this study, lack of personal prior use

or experience may have inhibited endorsement of 'Baby Check' as a means of support for new mothers.

Therefore without active endorsements from the hospital and community health care professionals associated with their baby's welfare it is possible that the mothers did not perceive the interventions as valued means of support.

### **Did participating in the research effect the anxiety and mood of mothers?**

It is possible that participation in this research project had a positive effect on the anxiety and mood of the mothers. It will be recalled that all mothers in this study, regardless of their intervention group, were also asked to make a daily record in a health diary although, as stated previously, the results of this diary were not reported in this thesis. It is possible that the mothers' perception of the study involved a sense of continuing care and concern for her welfare by the neonatal care team, even after her baby was discharged home. We will recall that the mothers decreased in anxiety and improved in mood states over time. However, when the mothers who received an intervention were combined and compared with the mothers who did not receive an intervention, there was no significant difference in the magnitude of change in anxiety or mood over time between the groups of mothers. Therefore it is possible that positive feelings of support which influenced a decrease in anxiety and an improvement in mood were generated just by participation in the study. This positive response to 'being researched', known as the 'Hawthorne effect', generates feelings of enhanced self-worth and support in the participants by being important enough to be the focus of a research project and the effect would have been equal across all the groups of mothers in the RCT (Mackay, 1973).

The 'Hawthorne effect' was also described in a report of a study to investigate the effect of advice given by general practitioners to men with increased risk of heart disease. Six months after the intervention was introduced, the risk factors and risk-scores had decreased by the same amount in both the 'high risk' men and the control group (Christersen, 1995). This unexpected improvement in all the men participating in the research was attributed to the 'Hawthorne effect'.

A RCT of social support in pregnancy following the previous birth of a LBW baby (Oakley et al. 1996) acknowledged that the size of the positive effect of the intervention may have been diminished when the majority of the control group reported that they felt supported by

participation in the study. This unexpected perception of support, even though they did not receive the intervention, was attributed to the 'Hawthorne effect'.

The proposal that the 'Hawthorne effect' influenced the decreased anxiety and the improved mood of the mothers after their baby's discharge from the NNU was further supported by the findings that their anxiety and mood were significantly more positive than the normal values for similar populations cited by Spielberger et al. (1983) and Lorr and McNair (1988) at the end of the intervention period.

Having discussed the possible methodological factors which might have influenced the findings that the interventions had no effect on the anxiety and mood of mothers who had their baby discharged from a NNU, the discussion will now progress to consider the possible influence of contextual issues.

## **DID CONTEXTUAL FACTORS INFLUENCE THE OUTCOME OF THE RCT?**

### **Influences on the anxiety and mood of the neonatal unit mothers**

In an attempt to understand why access to 'Baby Helpline' and or 'Baby Check' had no effect on the anxiety or mood of mothers following their baby's discharge from a NNU, it was necessary to explore if contextual or real world factors, related to the mothers, might have influenced the findings of the RCT.

### **Were the interventions appropriate for the neonatal unit mothers?**

The possibility exists that the specific support interventions selected were inappropriate to relieve anxiety and improve the mood states of mothers following their baby's discharge from a NNU. However, the positive response of mothers towards 'Baby Check' supported its selection (Thornton et al. 1991b; Kai, 1994; Stewart et al. 1994) and the frequently cited health care concerns of mothers (Pridham et al. 1982; Gennaro, 1985; Kenner and Wright Lott, 1990; Zahr, 1991; McKim, 1993a; Pridham et al. 1994) supported the selection of 'Baby Helpline'. Reported difficulties in recognising the severity of illness in a baby (Stanton et al. 1980) and the expressed desire of mothers for specific and accurate information (Goldberg, 1978; Kenner and Wright Lott, 1990) supported the selection of both 'Baby Check' and 'Baby Helpline'. The choice of interventions therefore appeared to be appropriate for universal access by all mothers who had their baby discharged from a NNU.

Different results may have been obtained if the interventions had been targeted to a specific subset of NNU mothers. However, if evaluating support interventions for a subset of NNU mothers had been the purpose of this research, it is possible that different interventions might have been selected. Therefore, although it is possible that the interventions selected might have been inappropriate, the literature suggested that this was unlikely. However, other interventions might have been equally or more appropriate for the population of mothers who participated in this study.

### **Were the neonatal unit mothers too distressed to help?**

The literature suggests that the admission of their baby to a NNU was a crisis event for mothers (Caplan, 1960; Kaplan and Mason, 1960; Caplan et al. 1965; Miles and Carter, 1983; Miles, 1989; Perehudoff, 1990; Redshaw, 1997; Padden and Glenn, 1997). Increased worry, stress, depression and anxiety have also been described as features of the early weeks at home following discharge from a NNU (Gennaro, 1988; Brooten et al. 1988; Butts et al. 1988; McHaffie, 1989; McHaffie, 1990; Kenner and Wright Lott, 1990; Gennaro et al. 1990; McKim, 1993a; May, 1997). It seems possible therefore that no amount of additional support or specific interventions could actually relieve the anxiety and improve the mood of mothers who had their baby discharged from a NNU.

However, the findings of this study do not support this hypothesis. Although, at the time of their baby's discharge home, the NNU mothers were more anxious than the normal value for women of a similar age the difference was not significant. Furthermore, at three months following discharge the mothers were significantly less anxious than other women of a similar age. Similarly, at the time of their baby's discharge home, the mood profile of the NNU mother was generally significantly more negative than the normal profile for British adults. However, at one month following their baby's discharge home, the mood profile of the mothers had improved and was significantly more positive than other British adults in four out of six mood dimensions. The improvement in mood continued and at two and three months after their baby's discharge home, the mood of the mothers was significantly more positive than the normal mood profile for British adults in all mood dimensions except energetic-tired. Anxiety and mood improved over time, and there were no significant differences in the magnitude of change in anxiety or mood between the mothers in the trial arm groups therefore these NNU mothers appear not to have been too distressed to respond to the support interventions.

**Were neonatal unit mothers too confident to need help?**

It is also possible to pose the contradictory argument that mothers who had their baby discharged from a NNU had sufficient confidence not to need additional support interventions. The possibility existed that the mothers acquired confidence in their baby care skills and knowledge of their baby in the NNU prior to their baby's discharge home. It was also possible that their confidence was sustained and developed through the support they received at home.

Perehudoff (1990) suggests that parents acclimatise to the NNU environment over time. It would appear possible therefore that during their baby's stay in a NNU the mothers were supported by nursing staff as they developed expertise and confidence in their baby care skills. In addition, through repeated practice of their skills over time, the mothers may have felt prepared for the practical aspects of baby care following discharge home. In this current study, although the NNU mothers were significantly more prone to anxiety they were not significantly more anxious than other women of a similar age around the time of their baby's discharge home. This would suggest that the mothers were not excessively anxious about their baby's imminent discharge home from the NNU. This finding is supported by Redshaw (1997) who found that half of the mothers who had their baby discharged from a NNU described themselves as 'very confident' about caring for their baby in the unit and about going home. However, she also found that mothers of babies who had been ventilated and those with babies born at a lower gestation were less confident about going home.

In this study, at the time of their baby's discharge home (median 7 days, IQR 2-23 days), the anxiety score for the mothers was lower than the anxiety score for mothers of preterm babies three days after delivery (Gennaro, 1985) and one week after delivery (Gennaro, 1988) but higher than the anxiety score for mothers six weeks after birth (Green and Kafetsios, 1997). In this study the mothers' anxiety was lower at three months after their baby's discharge home than at the time of discharge. This study therefore complements the observations of other studies that mothers' anxiety decreases during their baby's stay in a NNU and they become even less anxious after their baby's discharge home.

From this present study, the picture that developed was one of mothers who became less anxious and improved in mood following their baby's discharge from a NNU irrespective of whether they received additional support interventions or not. These findings are confirmed by Brooten et al. (1988), Gennaro (1988) and Gennaro et al. (1990) who also found that

following their baby's discharge from an NNU mothers became less anxious over time without additional support interventions. However, the 'feeling lucky' effect described by Padden and Glenn (1997) that both mother and baby had survived the physical and emotional ordeal associated with admission to a NNU, could also have contributed to the reduction in anxiety and improvement in mood of mothers following their baby's discharge home irrespective of additional support interventions.

Clearly, following their baby's discharge from a NNU, the mothers can not simultaneously be too distressed and too confident for the interventions to have had an effect. Although consideration of both hypotheses is reasonable, the evidence from this present study appeared to favour the suggestion that the mothers might have had sufficient confidence and not be in need of additional support interventions.

#### **Summary of possible influences on the effectiveness of the interventions**

In summary therefore, it is possible that one or a combination of the following factors influenced the findings that access to 'Baby Helpline' and or 'Baby Check' neither increased nor decreased anxiety, mood states nor the magnitude of change in anxiety and mood in NNU mothers.

- The 'Hawthorne effect' of participating in a research project may have positively influenced the mothers so that even the mothers who did not receive an intervention felt supported and became less anxious and their mood improved following their baby's discharge from a NNU.
- It is possible that the lack of explicit promotion of the interventions by the NNU staff and the primary care team diminished the perceived value by mothers of the interventions as means of support. If the mothers did not regard the interventions as supportive they were unlikely to have a positive effect on the anxiety or mood of mothers following their baby's discharge from a NNU.
- As the mothers became less anxious and their mood improved over time anyway, it appeared possible that the mothers did not require additional support interventions to relieve their anxiety and improve their mood following their baby's discharge from a NNU. The lack of need for additional post discharge support may be a reflection of the mothers' experience whilst their baby was in the NNU or adequate formal and informal community support.

## **ANXIETY AND MOOD AND THE CHARACTERISTICS OF NEONATAL UNIT MOTHERS**

Although the RCT has shown that access to 'Baby Helpline' and or 'Baby Check' had no effect on the anxiety and mood states of mothers who had their baby discharged from a NNU, this thesis also sought to identify the characteristics of the NNU mothers that were associated with their anxiety and mood. Therefore this discussion will now focus on the characteristics associated with anxiety and mood states of mothers who had their baby discharged home from a NNU.

The characteristics of mothers associated with anxiety and mood around the time of their baby's discharge from a NNU and the characteristics associated with the change in anxiety and mood over time will be discussed. The mothers' change in anxiety and mood refers to the magnitude of change between the anxiety and mood states recorded around the time of their baby's discharge from the NNU and the anxiety and mood states recorded at three months following discharge. Therefore the magnitude of change in anxiety and mood are relative to the initial recording.

### **Characteristics of the neonatal unit mothers that influenced their anxiety**

With regard to anxiety and the characteristics of the NNU mothers the two objectives were:-

- to identify the mothers' characteristics that were associated with anxiety in mothers who had their baby discharged from a neonatal unit.**
- to identify the mothers' characteristics that were associated with the change in anxiety over time of mothers who had their baby discharged from a neonatal unit.**

### **Were the neonatal unit mothers more anxious than other women?**

As previously discussed in this chapter, the NNU mothers were significantly more prone to anxiety but were also significantly less anxious three months following their baby's discharge from a NNU than other women of a similar age described by Spielberger et al. (1983). Therefore although the NNU mothers had a greater propensity towards anxiety they were not more anxious than other women around the time their baby was discharged from the NNU or at three months later.

**What characteristics were associated with anxiety in the neonatal unit mothers?**

**influence of age, marital status and qualifications on trait-anxiety**

In this study, the mothers who were older, married or lived with their partner and those with higher or vocational educational qualifications on leaving full time education had a significantly lower trait-anxiety or predisposition for anxiety than other NNU mothers.

The findings of this present study were similar to the findings of Green and Kafetsios (1997) who showed that as maternal age, education and emotional support from a partner increased, trait-anxiety decreased in new mothers. In other groups of women with altered experiences of pregnancy, Statham and Green (1994) found trait-anxiety was significantly lower in pregnant women with living children than in pregnant women with no living children. Women with previous unsuccessful pregnancies had a significantly higher trait-anxiety than women who were pregnant for the first-time. However, they found no significant difference in the trait-anxiety of first-time pregnant women and women who had only had successful pregnancies. The level of trait-anxiety in mothers of term babies was found not to significantly effect their postnatal emotional well-being (Ball, 1994).

**Influence of age and mothering experience on state-anxiety**

In this study, around the time of their baby's discharge from a NNU, mothers who were older in age and those who had previous mothering experience were significantly less anxious than the other NNU mothers.

The NNU mothers in the present study had a mean age of 28.5 years at childbirth, which was consistent with the national average age at childbirth for 1995 (Office for National Statistics, 1996d). Sixty percent of the babies born to the NNU mothers in this study were born prematurely. Premature birth is associated with low or advanced maternal age (Berkowitz and Kasl, 1983; Hoffman and Bakketeig, 1984; Lumley, 1993). However, this polarity of age was not seen when all the mothers who had their baby discharged from a NNU were considered together. Green and Kafetsios (1997) also found that as maternal age increased new mothers became less anxious.

In contrast to this study, Brooten et al. (1988) found that neither parity nor age in mothers of preterm babies influenced their anxiety at the time of their baby's discharge from the NNU. However, Green and Kafetsios (1997) found that new mothers with previous mothering experience were less anxious than first-time mothers.

### **Influence of mothering experience and delivery type on the change in anxiety over time**

As previously discussed, the NNU mothers in this study became less anxious over time. However, the magnitude of change in anxiety, with and without adjustment for trait-anxiety, was significantly greater for first-time mothers compared with other mothers and mothers who delivered by Caesarean section under epidural anaesthetic compared with mothers who had a normal delivery. The magnitude of change in anxiety for mothers who had a forceps/Ventouse delivery compared with mothers who had a normal delivery was considerable and only just failed to be significant.

In this study, although the first-time mothers were more anxious than other mothers at the time of their baby's discharge from the NNU, they experienced greater positive change in their anxiety at three months following their baby's discharge home than other mothers. The learning curve for first-time mothers is great. Therefore the magnitude of change in anxiety over time seen in first-time mothers compared with experienced mothers probably reflected 'catch-up' with other mothers as the skills of baby care became more established and the role, demands and expectations of motherhood became more familiar.

As previously stated, the magnitude of change in anxiety is relative and there were no significant differences between the types of delivery and no association between delivery type and anxiety at discharge. Therefore the magnitude of positive change in anxiety attributed to Caesarean section under epidural and forceps/Ventouse delivery was likely to be the effect of the delivery type and not a difference from the initial anxiety level.

In contrast to this study, Gennaro (1988) found that neither parity nor type of delivery significantly influenced anxiety over time in the mothers of term or preterm babies. Also in contrast to this study, Brooten (1988) found anxiety was not significantly influenced by maternal age or parity at the time of discharge or at nine months after discharge. However, this present study agreed with Brooten (1988) that marital status, education or length of stay did not significantly influence state-anxiety.

### **Conclusions about the characteristics of the neonatal unit mothers that influenced their anxiety**

The conclusions that can be drawn about the characteristics associated with anxiety in the NNU mothers who participated in this study are:-

- Although the NNU mothers were more prone to anxiety than the normal values given for women of a similar age they were no more anxious around the time of their baby's discharge from a NNU or at three months after discharge.
- The NNU mothers who were younger or single or had lower educational attainment on leaving full-time education were more prone to anxiety than the other NNU mothers.
- At the time of their baby's discharge home, the mothers who were younger and the first-time mothers were more anxious than the other NNU mothers.
- The decrease in the mothers' anxiety from around the time of their baby's discharge from a NNU to three months following discharge was greatest for:-
  - first-time mothers compared with experienced mothers and probably reflected their 'catch-up' with other mothers
  - mothers who had a Caesarean section under epidural compared with mothers who had a normal delivery.

Having discussed the characteristics that were significantly associated with anxiety in mothers who had their baby discharged from a NNU, this discussion will now consider the characteristics associated with their mood states.

#### **Characteristics of the neonatal unit mothers that influenced their mood**

Two objectives which related to mood and the characteristics of the NNU mothers were:-

- to identify the mothers' characteristics that were associated with the mood states of mothers who had their baby discharged from a neonatal unit.**
- to identify the mothers' characteristics that were associated with change in mood states over time of mothers who had their baby discharged from a neonatal unit.**

#### **Were the mood states of neonatal unit mothers different from other adults?**

We will recall that six mood dimensions were described; composed-anxious, agreeable-hostile, elated-depressed, confident-unsure, energetic-tired and clear headed-confused. At the time of their baby's discharge from a NNU the mood profile of the mothers was significantly more negative for all mood states, except the agreeable-hostile mood

dimension, than the mood profile of other British adults (Bartram et al. 1991). However, at one, two and three months following their baby's discharge home, the mothers were significantly more composed, more elated, more confident and more clear headed but remained significantly less energetic than other British adults. In addition, at two and three months following their baby's discharge home the mothers were also significantly more agreeable than the normal values. Therefore the mood states of the mothers who had their baby discharged from a NNU were different from other British adults.

**What characteristics of the neonatal unit mothers were associated with their mood around the time of their baby's discharge home?**

**Influence of maternal age**

This study found that as maternal age increased the mothers were significantly more positive on the agreeable-hostile mood dimension around the time of their baby's discharge home than younger mothers. This finding was at variance with the finding of Brooten et al. (1988) who reported no significant difference in hostility between younger and older mothers of preterm infants. The findings of this present study do not support the findings of Redshaw (1997) who reported that younger mothers felt significantly more confident than older mothers about caring for their baby after discharge from a NNU.

**Influence of adverse obstetric history**

The mothers who had an adverse obstetric history were significantly more composed than the other NNU mothers. This finding is most likely to be explained by the outcome of the present pregnancy being a live birth, which compares positively with their previous experience. This finding complements the finding of Statham and Green (1994) who reported that women who had experienced a previous unsuccessful pregnancy, but had living children, were less anxious in a subsequent pregnancy than other pregnant women who were childless and who had previously experienced unsuccessful pregnancies. Women who had living children had proof it was possible to have a positive pregnancy outcome.

Gennaro (1985) suggested that mothers of preterm babies who had experienced previous adverse obstetric events might be at increased risk of problems associated with adaptation to their premature infant. However, this assertion cannot be verified by this present study.

### **Influence of mothering experience and gestation at birth**

The more experienced mothers and the mothers of babies born at a lower gestation were significantly more composed, more confident, more energetic and more clear headed than the first-time mothers and the mothers who gave birth to a gestationally more mature baby. Redshaw (1997) also found that experienced mothers felt more confident about caring for their baby after discharge home but, contrary to this study, mothers of babies with a lower gestation were less confident about taking their baby home. In contrast to this present study, Brooten et al. (1988) found that, before discharge home, multiparous women were significantly more depressed than primiparous women and Gennaro (1988) found that mothers of preterm babies were significantly more anxious and depressed than mothers of term babies. Similarly, Choi (1972) found that lower gestation was significantly correlated to greater anxiety and depression in mothers of low birth weight babies but not mothers of 'full-size' infants.

### **Influence of birth weight and discharge weight**

The mothers of lower birth weight babies and the mothers of babies with a lower discharge weight were significantly more composed, more elated, more confident, more energetic and more clear headed than the mothers of higher birth weight babies or the mothers of higher discharge weight babies. These findings may reflect the successful completion of adaptation by mothers as described by Steel (1987) or relief that their baby has successfully achieved the milestone of discharge home. These findings contrast with the findings of Choi (1972) who reported that lower birth weight was significantly correlated to greater anxiety and depression in mothers of low birth weight babies but not mothers of 'full-size' infants.

### **Influence of birth at 32 or less weeks gestation and/or 1.5Kg or less birth weight**

At the time of discharge from the NNU, the mothers who gave birth to their baby at 32 or less weeks gestation and/or 1.5Kg or less birth weight were significantly more composed, more elated, more confident and more clear headed than the mothers who gave birth to larger and more mature babies. These findings compliment the findings of Gennaro (1988) and Gennaro et al. (1990) who found no association between the severity of infant illness, which is likely to be negatively correlated with lower birth weight and lower gestation at birth, and anxiety and depression in mothers of preterm infants and very low birth weight infants. In addition, Gennaro et al. (1990) found there was no significant difference in anxiety or depression between mothers of very low birth babies and mothers of low birth weight babies at birth or at discharge home.

The babies born at 32 or less weeks gestation and/or 1.5Kg or less birth weight were likely to have had a longer stay in the NNU than the more mature or heavier babies. The mothers whose infants stayed longer in the NNU had more time to adapt and develop their mothering skills, recover from the birth or experience a greater sense of relief about discharge and thereby enhance their mood (Brooten et al. 1988).

Another possible explanation for this positive mood response in the mothers of the earliest and smallest babies is the notion of 'rescue'. Peredhudoff (1990), Affonso et al. (1992), Redshaw (1997) and Padden and Glenn (1997) report that although the NNU environment is perceived as a negative stressor, it was also seen as a positive environment in terms of being an appropriate place for a baby who requires intensive care and therefore instrumental in the baby's survival.

### **Influence of delivery type**

In this study, at the time of discharge from the NNU, the mothers who had a normal delivery were significantly more energetic than the mothers who had other types of delivery. In contrast, Green and Kafetsios (1997) found that Caesarean delivery was not related to tiredness. However, in a study on the transition to parenthood, Woollett and Parr (1997) found that women described their tiredness and exhaustion after childbirth as a factor that affected their ability to recover and cope in the early weeks.

### **Influence of length of stay**

In this study, the mothers of babies who stayed longer on the NNU were significantly more energetic and clear headed than mothers of babies who had a shorter duration of stay. As these measurements of mood were recorded around the time of the baby's discharge from a NNU the positive effect seen probably reflects the longer emotional and physical recovery time since delivery of the baby or a greater sense of relief about imminent discharge.

The findings of this present study support Brooten et al. (1988) who also found that length of stay effected maternal mood around the time of the baby's discharge. Mothers of preterm babies with longer duration of stay in a NNU were less depressed than the mothers of babies who had a shorter duration of stay although length of stay had no effect on their hostility mood.

Having discussed the characteristics of mothers that were associated with their mood states around the time of their baby's discharge home, this chapter will now progress to discuss the characteristics of the NNU mothers associated with their change in mood over time followed by a summary of the characteristics that influenced the mood states of NNU mothers.

**What characteristics of the neonatal unit mothers were associated with change in their mood states over time?**

**Inter-relationship of characteristics**

As previously described, the mothers' change in mood over time refers to the magnitude of mood change between the mood states recorded around the time of their baby's discharge from a NNU and the mood states recorded three months following discharge.

In this study of mothers who had their baby discharged from a NNU, the magnitude of change in their mood states was significantly associated with their mothering experience, delivery type, birth weight, gestation at birth, birth at 32 or less weeks gestation and/or 1.5Kg or less birth weight, length of stay and discharge weight.

It will also be recalled that birth weight, gestation at birth, birth at 32 or less weeks gestation and/or 1.5Kg or less birth weight, length of stay and discharge weight are all highly correlated and inter-related. Multivariate analysis was therefore undertaken to identify the inter-relationship of the mothers' characteristics on the change in mood over time. Multivariate analysis of the mothers' characteristics that had a significant effect on the magnitude of change in their mood over time were identified as mothering experience, gestation at birth and delivery type.

A multivariate model was used with and without inclusion of the mothers' predominately negative mood states recorded at the baseline, that is, around the time of their baby's discharge home. Therefore if the significant effect of a characteristic on mood persisted with the baseline score included in the model, the change in mood was more likely to be due to that characteristic rather than an effect of the change from a relatively negative baseline mood or condition.

**Influence of mothering experience**

In this study, compared with the experienced mothers, the first-time mothers showed a significantly greater positive change in mood on the confident-unsure, energetic-tired and

clear headed-confused mood dimensions between their baby's discharge from a NNU and three months following discharge. These improvements in mood did not persist when the baseline moods were included in the models. The first-time mothers had lower moods than experienced mothers at the time of their baby's discharge home. Therefore in the first-time mothers the greater positive changes in mood probably reflect their 'catch up' with more experienced mothers as they became more familiar with baby care and motherhood. These findings are at variance with the findings of Gennaro (1988) who found that parity had no effect on anxiety or depression.

### **Influence of gestation at birth**

In this study, gestation at birth was associated with significantly greater negative mood changes for the mothers on the confident-unsure and the clear headed-confused mood dimensions between the time of their baby's discharge from a NNU and three months following discharge. Compared with the mothers who delivered their baby at 40 or more weeks of gestation, all the mothers who delivered preterm babies showed negative mood change. The mothers of infants born between 24-29 and 33-37 weeks of gestation made a significantly negative mood change on the confident-unsure mood dimension. Compared with mothers who delivered their baby at 40 weeks gestation or more, the mothers of babies with decreasing gestation showed significant increasingly negative clear headed-confused mood change. The significant negative mood change did not persist when the baseline moods were included in the model.

The mothers of babies born at a lower gestation indicated more positive mood states than the mothers of babies born at a higher gestation around the time of their baby's discharge home. Discharge home is a tremendous milestone of achievement for the mothers of preterm babies and is likely to have played a part in their positive mood at that time. However, the achievement of developmental milestones for preterm infants are related to their corrected age, that is their age calculated as if birth had occurred on the expected due date. In the three months since discharge from the NNU it is possible that the mothers of the many preterm infants received little encouragement from their baby to generate positive mood change. This compares poorly with the mothers' previous experience in the NNU when their baby's medical progress was more tangible. The perceived lack or delay in developmental progress by preterm babies can undermine the confidence and create confusion in mothers. However, perceived delay in developmental progress can be attributed to unrealistic expectations that could be addressed through appropriate education initiatives.

The findings of this study are at variance with the findings of Gennaro (1988) who found no difference in the change in anxiety or depression over time between mothers of preterm and term infants.

### **Influence of delivery type**

In this study, delivery type was associated with significant mood change in the mothers for the composed-anxious, agreeable-hostile, elated-depressed, confident-unsure, energetic-tired and clear headed-confused mood dimensions following their baby's discharge home.

Compared with mothers who had a normal delivery, mothers who delivered by Caesarean section under general anaesthetic made negative mood change whilst mothers who delivered by forceps/Ventouse made positive mood change on the composed-anxious mood dimension over time.

The mothers who delivered by Caesarean section under epidural had a significantly greater positive agreeable-hostile mood change compared with mothers who had a normal delivery. However, when the baseline mood was included in the model, mothers who delivered by Caesarean section under general anaesthetic made a significantly greater negative change than mothers who had a normal delivery.

Compared with the mothers who had a normal delivery, the mothers who delivered by Caesarean section under general anaesthetic made a significantly greater negative change on the elated-depressed and the confident-unsure mood dimension. The significant negative mood change persisted with the baseline mood included in the model, which suggested an effect due to the type of delivery and not just a change in mood from the baseline.

Compared with the mothers who had a normal delivery, the mothers who had a forceps/Ventouse delivery made a significantly greater positive change in their energetic-tired mood dimension whilst the mothers who delivered by Caesarean section under general anaesthetic made a negative mood change.

In this study, compared with the mothers who had a normal delivery, the mothers who delivered by Caesarean section under general anaesthetic made a significantly greater negative change on the clear headed-confused mood dimension. The significant negative

mood change persisted with the baseline mood included in the model, which suggested an effect due to the type of delivery and not just a change in mood from the baseline.

The mothers who delivered by Caesarean section under general anaesthetic became relatively worse on all six mood dimensions compared with the mothers who had a normal delivery. This may have been due to gradual modification of an initially elevated mood due to the notion of 'rescue' of the baby from a failing placenta or pregnancy. However, even though Caesarean section under general anaesthetic may be in response to an obstetric crisis necessitating urgent delivery of the baby some mothers may perceive themselves as failures for not being able to have a normal delivery and this may have been reflected in their negative mood change.

In this study, the change in mood over time following an instrumental delivery or Caesarean section under epidural was positive in all mood dimensions compared with a normal delivery. Forceps/Ventouse delivery or Caesarean section under epidural may also represent an end to a painful or difficult delivery for the mother or the 'rescue' of a baby in distress. Alternatively, this positive change mood may signify a shift in the mothers concern from herself to that of her baby (Affonso et al. 1992). In contrast to this present study, Ball (1994) reported that type of delivery did not significantly impact on the emotional well-being of mothers of well babies.

Ryding et al. (1998) suggests that unplanned Caesarean section and instrumental delivery should be regarded as a marker for possible post-traumatic stress. In contrast to this present study, Gennaro (1988) found that delivery type had no effect on anxiety or depression over time in the mothers of term and preterm babies.

#### **Conclusions about the characteristics of the neonatal unit mothers that were associated with their mood states**

- Around the time their baby was discharged from a NNU, the mood profile of the mothers was significantly more negative than the values given for mood in normal British adults.
- At one, two and three months following their baby's discharge home, the NNU mothers were generally more positive in their mood than other British adults.

Therefore we can conclude that the mood states of mothers who had their baby discharged from a NNU were different from other British adults.

- The characteristics of the NNU mothers that had a significant, positive influence on their mood profile around the time of their baby's discharge home were:-
  - increasing maternal age
  - adverse obstetric history
  - previous mothering experience
  - lower gestation at birth
  - lower birth weight
  - lower discharge weight
  - birth at 32 or less weeks gestation and/or 1.5Kg or less birth weight
  - normal delivery
  - longer length of stay.

However, we will recall that birth weight and gestation are highly correlated and are also inter-related with both length of stay and discharge weight. Therefore multivariate or multiple characteristic analysis for the change in mood identified the most dominant or influential characteristics over time.

- The characteristics of mothers, who had their baby discharged from a NNU, which were significantly associated with their change in mood over time were:-
  - mothering experience - first-time mothers made significant positive mood changes compared with experienced mothers for the confident-unsure, energetic-tired, and clear headed-confused mood dimensions.
  - gestation at birth - the mothers of preterm babies made significant negative mood changes compared with mothers of term babies for the confident-unsure and clear headed-confused mood states.
  - delivery type – significantly effected all six mood dimensions. The mothers who had a Caesarean section under general anaesthetic made significant negative mood changes compared with mothers who had a normal delivery. The significant negative mood change persisted with four mood states, agreeable-hostile, elated-depressed, confident-unsure and clear headed-confused, when the baseline mood

was included in the model, which suggested an effect due to the type of delivery and not just a change in mood from the baseline.

Therefore we can conclude that the magnitude of mood change over three months for mothers who had their baby discharged from a NNU was significantly influenced by mothering experience, gestation at birth and delivery type.

The characteristics of the NNU mothers that appeared to be significantly associated with their anxiety and mood states have been discussed. However, it appears that all mothers are anxious when they take their new baby home (Chavasse, 1878; Adams, 1963; Bull, 1981; Pridham et al. 1982; Harrison and Hicks, 1983; Smith, 1989), and the question therefore arose – to what extent are mothers who take their baby home from a NNU different from other new mothers? We will examine this issue next.

## **THE EXTENT OF DIFFERENCES IN THE CHARACTERISTICS OF NEONATAL UNIT MOTHERS AND POSTNATAL WARD MOTHERS**

### **Comparison of mothers' characteristics**

In order for the findings on anxiety and mood in NNU mothers to be interpreted within the context of all new mothers, the comparison study explored the extent of differences between mothers who had their baby discharged from a NNU and mothers who received standard postnatal care and were discharged home with their baby from the PNW. The discussion will therefore continue with a comparison of the characteristics of NNU mothers and other new mothers.

### **Mothers involved in this part of the comparison study**

It will be recalled that NNU mothers who were randomly allocated to receive neither 'Baby Helpline' nor 'Baby Check' were matched with PNW mothers by age and previous mothering experience, therefore no interpretations can be made about these two characteristics. Standard post discharge care from the primary care team was available to all of the mothers and none were allocated additional support interventions. The differentiating factor between the mothers was therefore that the matched NNU mothers had their baby admitted and subsequently discharged from a NNU and the PNW mothers received standard postnatal care and were discharged home with their baby from the PNW.

Social and demographic factors such as low or advanced maternal age, single status, low educational attainment, smoking and poor housing are frequently associated with increased risk of premature birth and low birth weight (Berkowitz and Kasl, 1983; Hoffman and Bakketeg, 1984; Lumley, 1993). However, increased risk does not necessarily indicate a causal factor. Furthermore, the homogenous group of 'neonatal mothers' who had their baby discharged from a NNU who are the focus of this study also included mothers of term and well grown babies.

The objective that related to the characteristics of NNU mothers who were matched with PNW mothers in the comparison study was:-

- to identify the characteristics of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

**Which characteristics were similar in the neonatal unit mothers and the postnatal ward mothers?**

**Qualifications**

This comparison study found that there were no significant differences between the NNU mothers and the PNW mothers for educational attainment on leaving full time education. This finding was contrary to the findings of Claussen et al. (1998) who reported higher rates of moderately preterm and term small for gestation births in first-time mothers with lower education compared with mothers who had a longer period of education.

Nordentoft et al. (1996) also found premature birth and intrauterine growth retardation to be associated with poor school education. However, Mercer et al. (1996) did not find duration of education a risk factor associated with spontaneous preterm birth.

**Adverse obstetric history**

In this study there was no significant difference found between the NNU mothers and PNW mothers in comparing previous adverse obstetric events combined. This finding was not consistent with the epidemiological evidence reported by Lumley (1993). However, this study did not include 'previous preterm birth' in the categories of previous obstetric events, which was a serious oversight. However, when the individual previous obstetric events were considered, the incidences of previous termination of pregnancy and baby death (which included still birth, neonatal and infant deaths) were significantly greater for the NNU mothers than the PNW mothers. These findings have implications for the management of subsequent pregnancies. Papiernik (1993) and Meis (1998) showed that

previous still birth was a significant risk factor for subsequent preterm birth. Lumley (1993) and Zhou et al. (1999) also reported an association with previous termination of pregnancy and preterm birth. However, Hoffman and Bakkeig (1984) reported that although late miscarriage and still birth are important risk factors for subsequent preterm delivery, early baby loss was not predictive of subsequent preterm birth.

### **Smoking**

This study found there was no significant difference between the NNU mothers and the PNW mothers for the frequency of women who smoked cigarettes, smoked during pregnancy or for other household smokers. These findings were contrary to the findings of Hemminki and Starfield (1978) and Nordenstoft et al. (1996) who found that smoking was associated with premature birth and intrauterine growth retardation, which are both criteria for admission to a NNU. It was therefore expected that the frequency of smoking would be higher in the NNU mothers, however this study did find that the babies of the NNU mothers were born at a significantly lower gestation and birth weight than the babies of the PNW mothers. However, smoking was not found to be a significant predictor of premature birth by Mercer et al. (1996) or Adams (1995). Although smoking was shown to exacerbate the effect of increasing maternal age as a risk factor for admission to a NNU, Yüksel (1996) did not identify smoking as an independent risk factor.

### **Home tenure**

In this comparison study home tenure was a proxy measure for family financial and social status at the time of birth, and there was no significant difference between the NNU mothers and the PNW mothers. Mercer et al. (1996) found that poor home conditions were not a risk factor for preterm birth, however the wider context of poor social environment was a significant risk. Lumley (1993), suggested that any social differences implicated in the cause of preterm birth were better regarded as a reflection of the woman's whole environment. Any differences, she suggested, were markers of the mother's control over her 'personal, family and social resources as well as social mores'.

### **Access to a telephone**

This study showed that there was no significant difference in access to a telephone between the NNU mothers and the PNW mothers. The majority (over 90%) of mothers in both groups had domestic access to a telephone, which was consistent with the national rate of telephone ownership in 1994 (Office of Population Censuses and Surveys, 1996). Therefore the mothers who had their baby discharged from a NNU were no more

advantaged or disadvantaged in terms of domestic access to a telephone than the PNW mothers or other adults in the community.

Having discussed the characteristics of NNU mothers and PNW mothers that were similar, the discussion continues with the mothers' characteristics that were different.

**Which characteristics were different in the neonatal unit mothers and the postnatal ward mothers?**

**Marital status**

In this study significantly more of the PNW mothers than the NNU mothers were married or lived with their partner compared with all the other mothers. Nordentoft et al. (1996) showed that not living with a partner was associated with premature birth but not intrauterine growth retardation. Although Berkowitz and Kasl (1983), in preterm prediction studies, found single status to be associated with spontaneous preterm delivery Mercer et al. (1996) found that living alone was only significant for spontaneous preterm delivery in multiparous women. Meis et al. (1998) also found living alone not to be significant for indicated preterm birth. However, a review of risk scoring for preterm birth by Shiono and Klebanoff (1993) suggested that most systems considered existing single parenthood to be an increased risk factor.

**Birth weight**

This comparison study found that the birth weight of the babies born to the NNU mothers was significantly lower than the birth weight of babies born to the PNW mothers. This difference was expected as low birth weight is a criterion for admission to a NNU. Therefore the whole scenario of childbirth and early motherhood for the NNU mothers would have been contrary to normal maternal expectations and the potential to impact negatively on the perinatal anxiety and mood states of mothers is well supported by the literature (Jeffcoate et al. 1979; Borg and Lasker, 1982; Rubin, 1984; Oakley et al. 1984; Rajan and Oakley, 1990; Affonso et al. 1992; Raphael-Leff, 1998).

As discussed earlier in this chapter, birth weight was not related to anxiety, and decreasing birth weight had an increasingly positive effect on mood states in mothers at the time of their baby's discharge from the NNU. This would suggest that the negative effects on the anxiety and mood states of mothers, attributed to their baby's admission to a NNU reported in the literature, had largely resolved by the time of discharge. Generally, the lowest birth weight babies would stay in a NNU longer than higher birth weight babies.

### **Gestation at birth**

In this comparison study the gestation of the babies born to the NNU mothers was significantly lower than the gestation of babies born to the PNW mothers. This difference was expected as low gestation at birth is a criterion for admission to a NNU. However, 42% of the NNU mothers delivered their baby at or beyond term and most of these mothers could therefore reasonably have expected their baby to be with them on the PNW. The effect of the impact of their dashed expectations would be similar to that of mothers who delivered their baby prematurely. However, as discussed earlier in this chapter, gestation was not related to anxiety, and decreasing gestation had an increasingly positive effect on mood states of mothers at the time of their baby's discharge from the NNU.

### **Type of delivery**

This study found there was a significant difference between the type of delivery experienced by the NNU mothers and PNW mothers. More NNU mothers delivered their baby by Caesarean section under general anaesthetic than the PNW mothers and fewer NNU mothers had a normal delivery than the PNW mothers. These differences were even more marked when the disparity between the type of delivery experienced by the PNW mothers and the hospital rates for Caesarean section and normal delivery are considered. In this study a large and unrepresentative proportion of the PNW mothers delivered their baby by Caesarean section. This was probably a reflection of their longer stay in hospital than mothers who had a normal delivery and therefore their greater availability for recruitment to this study. Even so, as many as 44% of the PNW mothers did not have an entirely normal delivery which, for some, might have generated losses in terms of expectations and self-esteem and feelings of failure or guilt for not delivering their baby 'normally' as described by Sherr (1995). Furthermore, as stated earlier Ryding et al. (1998) suggest that unplanned emergency Caesarean section and instrumental deliveries should be regarded as a marker of possible post-traumatic stress in new mothers.

### **Conclusions on the extent of differences in the characteristics of the neonatal unit mothers and the postnatal ward mothers**

- The characteristics associated with mothers who have preterm or low birth weight babies do not necessarily reflect the characteristics of all the mothers who have their baby admitted and subsequently discharged from a NNU.

- There were few significant differences in the characteristics of mothers who had their baby discharged from a NNU and mothers who were discharged home with their baby from the PNW, however past and present obstetric factors appeared to be more discriminating than social factors.

Having considered the extent of differences in the characteristics of NNU mothers and PNW mothers, this discussion will continue with consideration of the extent of differences in their anxiety and mood.

## **THE EXTENT OF DIFFERENCES IN ANXIETY AND MOOD IN THE NEONATAL UNIT MOTHERS AND THE POSTNATAL WARD MOTHERS**

### **Anxiety in neonatal unit mothers and postnatal ward mothers**

The two objectives which related to anxiety in the NNU mothers who were matched with the PNW mothers were:-

- to discover the levels of anxiety of mothers who had their baby discharged from a neonatal unit, and compare this with mothers who were discharged home following standard postnatal care.
- to discover the extent of change in anxiety over time of mothers who had their baby discharged from a neonatal unit, and compare this with mothers who were discharged home following standard postnatal care.

### **Were neonatal unit mothers more prone to anxiety than postnatal ward mothers?**

This comparison study showed the propensity for anxiety was no more or less in mothers who had their baby discharged from a NNU than that of mothers who received standard postnatal care and were discharged home with their baby from a PNW.

### **Were the neonatal unit mothers more anxious than the postnatal ward mothers?**

In this comparison study, around the time of their baby's discharge home, the NNU mothers were no more or less anxious than the PNW mothers. However when their anxiety was adjusted for their trait-anxiety, the NNU mothers were significantly less anxious than the PNW mothers.

All the mothers became less anxious over time. At three months following their baby's discharge home, the NNU mothers were no more or less anxious than the PNW mothers,

with or without adjustment for their trait-anxiety. There was also no significant difference in the magnitude of change in anxiety over time, with or without adjustment for their trait-anxiety, between the NNU mothers and the PNW mothers. Therefore we can conclude that the NNU mothers were not more prone to anxiety or more anxious than the PNW mothers.

The findings in this study are at variance with those of Choi (1972) who found that the mothers of premature and low birth weight babies were more anxious than the mothers of term babies at three to five days following delivery. However, Gennaro (1988) found that mothers of preterm infants were significantly more anxious than the mothers of term babies only during the first postnatal week and that difference did not persist over the seven weeks of the study. The significantly greater anxiety in the mothers of preterm babies during their first postnatal week was not, as might be expected, related to the severity of their infant's illness.

The differences between the findings of this present study and the findings of Choi (1972) and the first week finding of Gennaro (1988) are probably due to differences of timing. In the first postnatal week, mothers of babies who required admission to a NNU may still be shocked or distressed about recent perinatal events. The mothers may have been unable to anticipate a good outcome to their crisis situation, whereas, in this present study, mothers who are about to take their baby home may have made emotional transitions.

However, the findings of this study are supported by Crnic et al. (1983) who found no significant differences in stress, social support or satisfaction with parenting between the mothers of preterm infants and the mothers of full term infants one month after discharge home.

In conclusion therefore, this present study found that mothers who had their baby discharged home from a NNU appear not be more prone to anxiety or more anxious than mothers who were discharged home with their baby from a PNW. In relation to the earlier discussion on the possible influences on the findings of the RCT, these findings appear to support the assertion that, following their baby's discharge from a NNU, it is unlikely that the NNU mothers were too distressed for any intervention to relieve their anxiety.

### **Mood in neonatal unit mothers and postnatal ward mothers**

The two objectives that related to mood states in the comparison of the NNU mothers who were matched with the PNW mothers were:-

- to discover the level of mood states of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers who were discharged home following standard postnatal care.
- to discover the extent of change in mood states over time of mothers who had their baby discharged from a neonatal unit, and to compare these with mothers who were discharged home following standard postnatal care.

**Were the mood states of the neonatal unit mothers different from the postnatal ward mothers?**

This study found that there were no significant differences between the NNU mothers and the PNW mothers for any of the mood states around the time their baby was discharged home or at one and three months following their discharge. At two months following their baby's discharge home, the NNU mothers were significantly less energetic than the PNW mothers. However, this was probably a chance finding as there were no other significant differences for any other mood dimension at any time point. Therefore, essentially there were no differences in the mood state profiles of mothers who had their baby discharged from a NNU and mothers who were discharged home with their baby from a PNW at the time of discharge or at one, two or three months after discharge. However, there were significant difference between the NNU mothers and the PNW mothers and the normal values for mood states in British adults (Bartram et al. 1991).

The finding that both the NNU mothers and the PNW mothers were less energetic than the normal values for British adults was not surprising, as extreme tiredness appears to be synonymous with early motherhood. However, at one, two and three months after their baby's discharge home, the NNU mothers had more significant positive mood differences from the normal values than the PNW mothers.

Therefore in relation to the earlier discussion of the possible influences on the outcome of the RCT, the proposal that the mood states of the NNU mothers were positive even without the interventions appears to be supported.

**Was the change in mood states of the neonatal unit mothers different from that of the postnatal ward mothers?**

Although there were essentially no differences in the mood profile at any of the four time points, the magnitude of mood change and the pattern of mood variation were different between the NNU mothers and the PNW mothers.

At one month following their baby's discharge home, the significant differences between the positive mood change of the NNU mothers and the negative mood change of the PNW mothers from their mood states at the time of discharge were significant for the composed-anxious and confident-unsure mood dimensions.

At two months following their baby's discharge home, the mood states of the NNU mothers and the PNW mothers converged and there were no significant differences in the magnitude of mood change from the baseline at the time of their baby's discharge home.

At three months following their baby's discharge home, the differences between the positive mood change of the NNU mothers and the negative mood change of the PNW mothers from their mood states at the time of discharge were significant for the composed-anxious, agreeable-hostile and elated-depressed mood dimensions.

This significant variation in the pattern of mood change was also seen by Gennaro et al. (1990) in a study of anxiety and depression in the mothers of VLBW and LBW babies. Gennaro (1988) also found that during the first postnatal week mothers of preterm babies were significantly more anxious and more depressed than the mothers of term babies. Although anxiety and depression in the mothers of term and preterm babies decreased over time, the significant difference did not persist over time. However, Gennaro (1988) also showed that mothers of term and preterm infants showed a temporary increase in anxiety and depression in the fourth and fifth postnatal weeks.

Therefore the significant differences in the magnitude of mood change were positive for the NNU mothers and negative for the PNW mothers at one and three months following their baby's discharge home. These findings have implications for the pattern of appropriate community support for NNU mothers and PNW mothers.

**Conclusions on the extent of differences in anxiety and mood of the neonatal unit mothers and the postnatal ward mothers**

- The mothers who had their baby discharged from a NNU were not more prone to anxiety or more anxious, at the time of their baby's discharge home or at three months following discharge, than the mothers who had standard postnatal care and were discharged home with their baby from the PNW.
- The mood states of the mothers who had their baby discharged from a NNU were not significantly different, at the time of their baby's discharge home or at one, two or three months after discharge, from the mothers who had standard postnatal care and were discharged home with their baby from the PNW.
- There were significant differences in the magnitude and pattern of mood change over time between the mothers who have their baby discharged from a NNU and the mothers who had standard postnatal care and were discharged home with their baby from the PNW. At one and three months following their baby's discharge home, the change in mood was generally positive for the NNU mothers and negative for the PNW mothers.
- We can therefore conclude that the NNU mothers were not more anxious or lower in mood than the PNW mothers. Therefore based on the evidence of this study, the NNU mothers do not appear to be in more need of additional support interventions than the PNW mothers following their baby's discharge home.

The extent of difference in the characteristics, anxiety and mood of mothers who had their baby discharged from a NNU and mothers who received standard postnatal care and were discharged home with their baby from the PNW have been discussed. The extent of differences in the post discharge experiences of NNU mothers and PNW mothers will now be considered.

## THE EXTENT OF DIFFERENCES IN THE POST DISCHARGE EXPERIENCES OF THE NEONATAL UNIT MOTHERS AND THE POSTNATAL WARD MOTHERS

### The mothers involved in this part of the comparison study

The NNU mothers and the PNW mothers who participated in this aspect of the comparison study were matched for time elapsed since discharge home, postcode, maternal age and previous mothering experience.

### Were the neonatal unit mothers more or less confident than the postnatal ward mothers?

The objective related to the comparison of confidence between the NNU mothers and the PNW mothers was:-

- **to discover the level of confidence in aspects of baby care expressed by mothers who had their baby discharged from a neonatal unit, and to compare this with mothers discharged home following standard postnatal care.**

### **Confidence in matched pairs of neonatal unit mothers and postnatal ward mothers**

In this study, matched pairs of NNU mothers and PNW mothers were compared for their self-assessment of their ability to cope with ten baby care scenarios. The majority of the NNU mothers felt less confident in recognising when their baby was not well but more confident about what to do if their baby vomited back medicine or stopped breathing than the PNW mothers. The matched pairs of mothers reported that they felt equally confident about all the other baby care scenarios.

The finding that the NNU mothers felt less confident than the PNW mothers in recognising when their baby was not well was surprising as they were more likely to have had previous experience of seeing their baby unwell. The greater confidence expressed by the NNU mothers compared with the PNW mothers for 'what to do if baby vomited back medicine' and 'what to do if your baby stopped breathing' was probably grounded in the familiarity with these events gained from experience acquired whilst their baby was in a NNU.

### **Overall confidence level for all the neonatal unit mothers and postnatal ward mothers**

This comparison study found that the majority of the NNU mothers and the PNW mothers assessed themselves to be 'moderately confident' or 'very confident' in their ability to cope with ten baby care scenarios. The only significant difference found was that the NNU

mothers felt themselves to be more confident than the PNW mothers about 'what to do if your baby stopped breathing', which was probably a reflection of the infant resuscitation skills sessions for parents provided on the NNU.

There were no significant differences between the NNU mothers and the PNW mothers in the overall scores for individual or group confidence that indicated that both groups of mothers felt 'moderately confident' in their ability to cope with a range of baby care scenarios.

The findings of this study are at variance with the suggestion by Crouch and Manderson (1993) that the responsibility of caring for a baby could challenge the self-confidence of new mothers. Adams (1963) also found that lack of confidence was common to all new mothers at home regardless of their postnatal experience. Redshaw (1997), in a study of mothers who had their baby admitted to a NNU, found that the mothers of the smaller sicker babies were more worried and less confident than others mothers about taking their baby home. In contrast, a study of mothers of preterm babies following discharge from a NNU found no correlation between the mothers' confidence and birth weight or gestation (Zahr, 1991). However, Redshaw (1997) also found that overall 90% of mothers who had their baby discharged from a NNU described themselves as 'very confident in caring for their baby at home' which supports the findings of the present study.

Pond and Kemp (1992) describe how low self-confidence and increased anxiety had the potential to interfere adversely with a woman's adaptation to motherhood and this has been shown in relation to mothers with a baby in a NNU (Mercer, 1977; Klaus and Kennell, 1982; Kenner and Wright Lott, 1990). However, in the mothers of preterm infants Gennaro (1985) found no correlation between anxiety and maternal adaptation. Zahr (1991) found that mothers who perceived their baby to be less difficult also perceived themselves to be more confident.

Tulman and Fawcett (1991) also found that mothers' self-confidence in their ability to cope and their satisfaction with the role of motherhood were closely correlated to their 'functional status'. Gennaro (1985) found that mothers of preterm babies reported less confidence in their mothering abilities than mothers of term babies but that mothers who were more anxious had better problem-solving abilities. Ball (1994) found that mothers with low 'emotional well being' were more anxious before birth and mothers who were more anxious also had low self-confidence about caring for their baby.

In this comparison study, the length of hospital stay prior to discharge was significantly different between the babies of the NNU mothers (median 21 days) and the PNW mothers (median 4 days). The longer period of hospitalisation for the NNU mothers compared with the PNW mothers may have enabled some resolution of their earlier anxieties and facilitated greater acquisition of baby care skills. The possibility existed therefore that increased proficiency in baby care skills enhanced self-confidence following discharge but this hypothesis is not supported by the findings of Zahr (1991).

Gennaro (1985) found no correlation between the premature infant's age at discharge from a NNU or the severity of illness with the mothers' adaptation to motherhood. Zahr (1991) also observed that maternal confidence was not related to mothers' behaviour or skills. Contrary to this present study, Jeffcoate et al. (1979) found that, at the time of discharge, only 50% of mothers with a preterm baby felt confident in handling their baby compared with the majority of term mothers after a much short period of hospital care. McHaffie (1990) found that although mothers of LBW babies felt confident about handling their baby in hospital, they were unsure of their ability to care for their baby at home and lacked confidence following discharge.

Therefore this study has shown there appeared to be no difference in confidence between the NNU mothers and the PNW mothers who assessed themselves as being moderately confident about baby care.

#### **Did the neonatal unit mothers have different worries to the postnatal ward mothers?**

It will be recalled that the objective that related to the comparison of worries and concerns between NNU mothers and PNW mothers was:-

- to discover the worries and concerns expressed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

#### **Worries and concerns identified by the mothers**

In this study there was no significant difference between the number of NNU mothers and PNW mothers who reported that they had worries and information needs about their baby's health or baby care since their baby's discharge from hospital. The NNU and the PNW mothers identified similar worries which were predominately related to respiratory function and feeding problems whilst the information needs focused mainly on feeding

issues and baby behaviour. In the health diaries NNU mothers reported feeling worried about their baby on a third of the reported days. Their worries were similar to those identified by other NNU and PNW mothers and mainly referred to feeding and related issues such as colic and constipation, and upper respiratory tract infections, snuffles, coughs and colds and 'difficulty with breathing'.

Differentiation between worries, concerns, information needs and anxieties is difficult, subjective and varies between individuals. A mother's choice of one descriptive word over another may infer a hierarchy of emotion attached to the issue or may reflect linguistic habit or preference. As mothers interchange and use all of these words there is no added value attributed to, for example, a worry over a concern. The interchangeable use of worries, concerns and anxieties is also reflected in the literature (Chavasse, 1878; Adams, 1963; Bull, 1981; Pridham et al. 1982; Harrison and Hicks, 1983; Smith, 1989).

The worries of mothers identified by this present study confirmed the findings of Rajan and Oakley (1990) and Pridham et al. (1982) that mothers worry about respiratory symptoms and that feeding and related issues were major practical worries and cause for concern for new mothers. Perceived 'difficulty with breathing' may have been a worry generated by previously observed apnoeic episodes even though those episodes would have resolved prior to discharge home. McKim (1993a) in a study of mothers of premature babies, found that almost half of the mothers perceived the first week at home following their baby's discharge from a NNU as difficult.

Issues relating to baby care were frequently cited as causes of worry in this present study and are confirmed by other previous studies (Pridham et al. 1982; Smith, 1989; Pridham et al. 1994; Schmied and Everitt, 1996; Weaver and Ussher, 1997). Adams (1963) found that mothers, half of whom had a low birth weight baby, had worries about baby care matters and that pre-discharge from a NNU mothers of low birth weight babies had more questions anticipating home care than other new mothers.

It might be supposed that formal parent preparation, education and support initiatives had developed and improved over time, however the findings of this study suggested that mothers still worried about the same baby care issues as they did thirty or more years ago. Two suggested possible interpretations are that health professional initiated preparation and support in early motherhood does not address the real issues of concern for new

mothers or, as is more likely, that baby care worries are inherent to early motherhood and no amount of preparation, information and support would prevent them occurring.

In this study, information needs identified concerned baby development, immunisations and follow-up schedules. On average, mothers who had their baby discharged home from a NNU identified worries or information needs on 44% of the reported days in the health diaries during the first month following their baby's discharge home. Goldberg (1978) suggested that parents of premature infants were more likely to develop realistic expectations of their baby if they had access to appropriate information about growth, development and behaviour. Acknowledgement of this has implications for clinical practice.

### **Worries and concerns revealed by the telephone logs**

The findings from the telephone logs identified worries and concerns related to health and baby care expressed by baby carers in the local community. The calls in the PNW telephone log focused on baby related information needs and advice about feeding and baby care and none of these calls related to babies who had been admitted to the NNU. The information and advice needs were however similar to those recorded in the Health Diary of mothers who had their baby discharged from a NNU and the NNU telephone log. Similar baby health problems, newborn concerns and information needs were reported by a telephone on-call service for parents of low birth weight babies (Butts et al. 1988). This suggested that the worries and information needs of new mothers at home were similar regardless of their early postnatal experiences.

The time of calls recorded in the telephone logs supported the proposal that the 'Baby Helpline' intervention would need to offer 24 hours, seven days a week availability. Although the primary health care team were available during weekday office hours, around half of the calls recorded in the PNW and the NNU logs and 40% of calls to A & E occurred during office hours.

The callers were not asked why they phoned any particular location neither were they asked why they had not called a member of the primary health care team. It remains unclear why recently delivered mothers chose to telephone the PNW rather than their community midwife with whom they had daily one-to-one contact until their baby was ten days old or the 'on-call' community midwife who provided out-of hours cover for the community midwifery team. It was possible that mothers and other carers of babies saw the primary health care team as a resource in times of sickness and not as a source of

health information and support. That view may also have been reinforced by the contemporary advertisement campaign to discourage out-of-hours calls to GPs unless there was serious injury or an emergency.

There was evidence that mothers and other carers of babies made an active decision regarding the most appropriate location to access the information required. The A & E telephone log recorded only 4% of calls about feeding and baby care compared with 74% of calls to the PNW and 69% of calls to the NNU about feeding and baby care. In contrast, the A & E log was the only location to record calls which related to head injury and accidental ingestion.

In conclusion, the worries and concerns of mothers following their baby's discharge from a NNU therefore appear to be similar to those of the PNW mothers and other mothers and carers of babies. In addition there appears to be evidence that some carers of infants were discriminating regarding the source of information accessed.

**Did the neonatal unit mothers experience more baby health care events than the postnatal ward mothers?**

The objective which related to the comparison of baby health events experienced by the NNU mothers and the PNW mothers was:-

- to identify the actual baby health care events experienced by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

In this study there were no significant differences between the actual baby health care events or behaviours experienced by the NNU mothers and the PNW mothers. However, the non-specific signs of illness in babies such as 'just not him/herself', unusual or persistent cry, floppiness, decreased activity, increased sleepiness or irritability or unusual movements were reported by more NNU mothers than PNW mothers. Hewson et al. (1990) suggests that babies demonstrate a multitude of non-specific signs that may indicate a minor, self-limiting illness or a potentially serious, even life-threatening illness. The possibility existed that the NNU mothers were more receptive to these non-specific signs because of their previous experience of observing similar events or their increased awareness of their significance.

In this study, the number of NNU mothers who had experienced a particular health problem was greater than the number of PNW mothers for 17 events, equivalent for three events and less for four of the health problems listed. This suggested that NNU mothers encountered multiple combinations of health problems in their baby compared with a less complex picture of health issues for the PNW mothers. This complicated picture of health problems may, in part, be a reflection of the NNU mothers' increased perception that their baby may be more predisposed to ill health because of their earlier health experiences.

In support of these findings, Bidder et al. (1974) found that mothers of preterm babies who experienced significant anxiety around the time of birth and their baby's discharge from a NNU also expressed anxiety about handling their early baby and perceived their baby as weak. Redshaw (1997) also found that as gestation at birth decreased the number of mothers who perceived their baby as small, fragile or weak increased. Levy (1980) also described 'premium babies' who were born after long periods of infertility, a history of perinatal loss or acute, severe neonatal illness, who were frequently regarded by their parents as especially vulnerable to illness and perceived as frequently unwell. Green and Solnit (1964) described the concept of 'vulnerable child syndrome' frequently associated with an unresolved anticipatory grief as experienced by mothers of babies admitted to a NNU (Caplan, 1960; Benfield et al. 1976).

Therefore in this study it appears that, although the NNU mothers reported a greater number of events, there was no significant difference between the actual type of baby health care episodes experienced by NNU mothers and PNW mothers.

#### **Did the neonatal unit mothers seek support from different sources than postnatal ward mothers?**

The objective which related to the comparison of professional and informal sources of information, advice and support accessed by NNU mothers and PNW mothers was:-

**- to identify the professional and informal sources of information, advice and support accessed by mothers who had their baby discharged from a neonatal unit, and to compare these with mothers discharged home following standard postnatal care.**

#### **Contacts with health professionals for information, advice and support**

In this study the NNU mothers had more contact with primary health care professionals than the PNW mothers. However, despite the greater number of health problems or

behaviours actually experienced by the NNU mothers, as a group they had fewer contacts with their general practitioner than the PNW mothers. As expected, health visitors made home visits to all mothers. The total number of contacts with health visitors by the NNU mothers was greater in all categories of contact, home visits, clinic visits and telephone calls than by the PNW mothers. This does not however necessarily reflect increased need or concern by the NNU mothers but, as suggested by Briscoe (1989), may have been an indication of increased health visitor concern or anticipation of need.

Only nine NNU mothers compared with all except one PNW mother had contact with a community midwife. This was probably a reflection of the NNU mothers' longer stay in hospital to be near their baby, however it would be unusual for many NNU mothers to stay in hospital as long as ten postnatal days. Following her discharge, if the mother does not receive home visits from a community midwife the opportunity to provide continuity of care and meet individual care and support needs appears to have been missed.

The greater number of health professional contacts experienced by the NNU mothers compared with the PNW mothers did not necessarily confer greater maternal satisfaction with support and information received. Levy (1980) found that parents of 'vulnerable' children made significantly more requests for medical care and were less satisfied with those care episodes than parents who did not perceive their children as 'vulnerable'.

### **Contacts with others for information, advice and support**

In this study, for both the NNU and the PNW mothers, family members, friends and neighbours were sources of advice and support accessed before health professionals. This was similar to the findings of previous research (Litman, 1974; Tarkka and Paunonen, 1996). However, by contrast Rajan and Oakley (1990) found mothers of low birth weight babies received less social support from family and friends than other mothers.

In this present study, when mothers were asked to identify potential sources of information, advice and support they cited health visitors and general practitioners before partners, family and friends. Recognition by the NNU mothers and the PNW mothers of potential sources of information, advice and support did not therefore seem to reflect their actual help-seeking behaviour. However, access and availability rather than differentiation about the quality of information likely to be received probably influenced help-seeking behaviour.

This present study found that mothers sought advice and support most frequently from their partner before their health visitors or general practitioner, which was similar to findings by McHaffie (1989). In contrast to this study, McHaffie (19889) also found that friends and other family members were consulted infrequently due to their lack of experience with small or previously sick babies. This same pattern of support seeking was also reported by Kenner and Wright Lott (1990) in mothers of both term and preterm babies discharged from a neonatal intensive care unit. In this present study on almost one-third of the days when worries were reported in the health diaries, mothers did not consult with anyone but there was no indication as to whether that was by choice or lack of opportunity. Mothers reported that they were 'generally satisfied' or 'very satisfied' with the advice and support they received. However, one mother reported being 'generally dissatisfied' with the advice received from her partner. In larger studies Rajan and Oakley (1990) and McHaffie (1989) have reported strained relationships with partners following discharge from a NNU.

When both formal and informal sources of information and support were considered the only significant difference in the sources of information, advice and support accessed by the NNU mothers and the PNW mothers was that significantly more PNW mothers consulted a pharmacist. There was also a trend for PNW mothers to seek information, advice or support from a wider range of sources than the NNU mothers. However, the number of times each source was accessed by individual mothers was not recorded therefore it was not possible to comment on the frequency of help-seeking behaviour.

In the health diary, the pattern of help-seeking behaviour by the NNU mothers to resolve information needs was different from that seen to resolve worries. To address their information needs mothers contacted health professionals more frequently than family members and vice versa for baby care concerns. The majority of mothers reported that they were 'generally satisfied' or 'very satisfied' with the information they received. These findings support McVeigh (1997) who reported that 'mothers seem to need appropriate information and advice as well as social support following the birth of a baby'.

In conclusion, the NNU mothers therefore had more contacts with the primary health care team than the PNW mothers. In relation to professional and informal sources of support, advice and information accessed by mothers, the only difference was significantly more of the PNW mothers than the NNU mothers consulted with a pharmacist.

**Were the neonatal unit mothers more or less satisfied than the postnatal ward mothers with health professional contacts?**

The objective that related to the comparison between the NNU mothers and the PNW mothers for their satisfaction with health professionals was:-

- to identify the level of satisfaction with present sources of professional health information and support expressed by mothers who had their baby discharged from a neonatal unit, and to compare this with mothers discharged home following standard postnatal care.**

**Satisfaction with acknowledgement of concern**

In this study the majority of the NNU mothers and the PNW mothers considered that all the primary health care professionals with whom they had contact had appreciated their level of concern regarding their baby's health. However, the NNU mothers perceived that health visitors and general practitioners sometimes did not appreciate the impact of their previous experience had on their current concerns. This was a surprising finding in relation to health visitors as they received a weekly update of the baby's progress whilst in the NNU.

Although the family GP was informed of the baby's admission and subsequent discharge from the NNU and would have received a summary of medical care, the deputising service used for out of hours calls would not be aware of the baby's medical history.

**Satisfaction with support and information**

In this study, there were no significant differences between the NNU mothers and the PNW mothers for their level of satisfaction with support from the primary health care team. The majority of mothers were 'satisfied' or 'very satisfied' with the support they received from their community midwife, health visitor and general practitioner.

In relation to information received from health professionals, although the majority of the NNU mothers reported being 'satisfied' with the information they received from health visitors, significantly more PNW mothers than the NNU mothers reported that they were 'very satisfied' with information received from health visitors. There were no other significant differences between the NNU mothers and the PNW mothers for their level of satisfaction with information received from their community midwife, health visitor and general practitioner.

The majority of the NNU mothers and the PNW mothers were therefore at least 'satisfied' with the support and information received from primary health care professionals.

However, the number of NNU mothers who indicated that they were 'dissatisfied' or 'very dissatisfied' with the information or support received from health visitors and general practitioners was greater than the number of PNW mothers.

### **Satisfaction with support and information in matched pairs of mothers**

Within the matched pairs of NNU and PNW mothers, the majority of the NNU mothers were less satisfied than their paired PNW mothers with the information and support received from community midwives and general practitioners. The majority of the NNU mothers compared with their paired PNW mothers, were also less satisfied with the information they received from health visitors however, a higher percentage of the NNU mothers indicated an equivalent level of satisfaction with the support they received from health visitors.

A possible contributing factor towards the NNU mothers being generally less satisfied than the PNW mothers with the support and information received from community health professionals may have been the contrast between the acute, dynamic, interventionist approach of NNU doctors and nurses who were very knowledgeable about the baby and familiar to the NNU mother and the unfamiliar approach of the community care team. Goldberg (1978) and Kenner and Wright Lott (1990) found that mothers of babies discharged from a NNU wanted accurate and specific information which related to their baby's growth, development and behaviour. Therefore a lack of specific information could have been the source of dissatisfaction by the NNU mothers.

The mixed messages of the findings of this study are both consistent and inconsistent with the literature. McHaffie (1989) found mothers of VLBW babies to be very dissatisfied with the information and support received from health visitors. Rajan and Oakley (1990) found that mothers of LBW babies disliked comparisons by health professionals with 'normal' babies and unsolicited advice. However, they also found that 20% of mothers wanted more information and support from health care professionals.

In conclusion therefore, the majority of the NNU mothers appeared to be at least as satisfied with the support and information they received from the primary health care team as the PNW mothers.

### **Was baby care information and advice accessed by the telephone?**

The objective which related to the acceptability of obtaining baby care information via the telephone was:-

- to identify the extent to which mothers and others access baby care information and advice via the telephone.**

The results of the telephone logs suggested that mothers and others felt able to access baby care information and advice via the telephone even from sources that did not actually promote a telephone helpline service. These findings support the growing literature on the use of telephone in health care (Furman, 1983; Angel et al. 1990; Hallam, 1991; Nagle et al. 1992; Lattimer et al. 1998). In addition, almost half of the NNU mothers and PNW mothers stated they would use a telephone helpline that was specifically designed to meet the information and support needs of new parents. A further ten mothers in each group said they would consider using such a helpline. These findings supported the provision of a telephone helpline as an appropriate intervention for supporting mothers following their baby's discharge from a NNU.

However, in relation to the telephone logs, the quality and appropriateness of the information and advice given to the caller was found to be extremely variable depending on the source of that information. Some information or advice given to the caller was found to be inconsistent, inaccurate and occasionally potentially dangerous. This observation therefore supported the use of evidence-based protocols for 'Baby Helpline' and the documentation of all calls.

Therefore it appears that mothers and other baby carers were able to access baby care information and advice via the telephone. However, without the use of protocols some information given to callers was inconsistent, inaccurate and occasionally potentially dangerous.

### **Conclusions on the extent of differences in post discharge experiences of the neonatal unit mothers and the postnatal ward mothers**

- There appeared to be no difference in confidence between the NNU mothers and the PNW mothers who assessed themselves as being moderately confident about baby care.

- The worries and concerns of mothers following their baby's discharge from a NNU appear to be similar to those of the PNW mothers.
- It appears that although the NNU mothers reported a greater number of events, there was no difference between the actual type of baby health care episodes experienced by mothers who had their baby discharged from a NNU compared with mothers who had their baby discharged from a PNW.
- The NNU mothers had more contacts with the primary health care team than the PNW mothers. In relation to professional and informal sources of support, advice and information accessed by mothers, the only difference was significantly more of the PNW mothers than the NNU mothers consulted with a pharmacist.
- The majority of the NNU mothers appear to be at least as satisfied with the support and information they received from the primary health care team as the PNW mothers. However, the matched pairs of mothers indicated that the NNU mothers were less satisfied with the support and information received from health professionals than the PNW mothers.
- Mothers and other baby carers felt able to access baby care information and advice via the telephone. However, without the use of protocols some information given to callers was inconsistent, inaccurate and occasionally potentially dangerous.

The extent of differences in the post discharge experiences of mothers who had their baby discharged from a NNU and mothers who had standard postnatal care and were discharged home with their baby have been discussed. This chapter will progress with a summary of the main conclusions for the entire study followed by a discussion on the implications of this research.

## **SUMMARY OF CONCLUSIONS**

### **Evaluation of 'Baby Helpline' and 'Baby Check'**

- The findings of the RCT showed that access to 'Baby Helpline' and or 'Baby Check' neither increased nor decreased the anxiety or mood states, or the magnitude of change over time of the anxiety or mood states of mothers who had their baby discharged from a NNU. However, the numbers of mothers in the study were small and

the findings that access to 'Baby Helpline' and or 'Baby Check' showed no evidence of effect on anxiety or mood states should be treated with caution.

However, these were unexpected findings and it is possible that one or a combination of the following factors influenced the anxiety and mood states of the NNU mothers and the outcome of the RCT.

- The 'Hawthorne effect' of participating in a research project may have positively influenced the mothers so that even the mothers who did not receive an intervention felt supported and became less anxious and their mood improved following their baby's discharge from a NNU.
- It is possible that the lack of explicit promotion of the interventions by the NNU staff and the primary care team diminished the perceived value by mothers of the interventions as means of support. If the mothers did not regard the interventions as supportive they were unlikely to have a positive effect on the anxiety or mood of mothers following their baby's discharge from a NNU.
- As the mothers became less anxious and their mood improved over time anyway, it appeared possible that the mothers did not require additional support interventions to relieve their anxiety and improve their mood following their baby's discharge from a NNU. The lack of need for additional post discharge support may be a reflection of the mothers' experience whilst their baby was in the NNU or adequate formal and informal community support.

#### **Conclusions about the characteristics of the neonatal unit mothers that influenced their anxiety**

- The NNU mothers were more prone to anxiety but were less anxious three months following their baby's discharge home than the normal values for women of a similar age.
- The NNU mothers who were younger or single or had lower educational attainment on leaving full-time education were more prone to anxiety than the other NNU mothers.

- At the time of their baby's discharge home, the mothers who were younger and the first-time mothers were more anxious than other NNU mothers.
- The magnitude of positive change in anxiety for the mothers from around the time of their baby's discharge from the NNU to three months following discharge was greatest for:-
  - first-time mothers compared with experienced mothers.
  - mothers who had a Caesarean section under epidural compared with mothers who had a normal delivery.

**Conclusions about the characteristics of the neonatal unit mothers that influenced their mood states**

- The mood profile of mothers who had their baby discharged from a NNU was significantly more negative at the time of their baby's discharge and thereafter significantly more positive than the normal values for British adults.
- The characteristics which significantly positively influenced the mood profile of mothers around the time of their baby's discharge home from a NNU were:-
  - increasing maternal age
  - adverse obstetric history
  - previous mothering experience
  - lower gestation at birth
  - lower birth weight
  - lower discharge weight
  - birth at or less than 32 weeks gestation and/or 1.5Kg birth weight
  - normal delivery
  - longer length of stay.

However, birth weight and gestation are highly correlated and are also inter-dependent with both length of stay and discharge weight.

- The characteristics of mothers, who had their baby discharged from a NNU, which were significantly associated with their change in mood over time were:-
  - mothering experience - first-time mothers making significant positive mood changes compared with experienced mothers

-gestation at birth - the mothers of preterm babies made significant negative mood changes compared with mothers of term babies.

-delivery type – significantly effected all mood dimensions. The mothers who had a Caesarean section under general anaesthetic made significant negative mood changes compared with mothers who had a normal delivery. The significant negative mood change persisted with four mood states when the baseline mood was included in the model, which suggested an effect due to the type of delivery and not just a change in mood from the baseline

**Conclusions on the extent of differences in the characteristics of the neonatal unit mothers and the postnatal ward mothers**

- The characteristics associated with mothers who have preterm or low birth weight babies do not necessarily reflect the characteristics of all mothers who have their baby admitted and subsequently discharged from a NNU.
- Apart from birth weight and gestation at birth, the only characteristics which were significantly different between the NNU mothers and the PNW mothers were:-

-marital status	-more NNU mothers were single
-delivery type	-more NNU mothers delivered by Caesarean section under general anaesthetic and fewer had a normal delivery than the PNW mothers
-adverse obstetric history	-previous termination of pregnancy and baby death (still birth, neonatal and infant deaths) were experienced by more of the NNU mothers than the PNW.

Therefore past and present obstetric events were more discriminating than social factors.

**Conclusions on the extent of differences in anxiety and mood of the neonatal unit mothers and the postnatal ward mothers**

- The mothers who had their baby discharged from a NNU were not more prone to anxiety or more anxious than the mothers who had standard postnatal care and were discharged home with their baby from the PNW.

- The mood states of the mothers who have their baby discharged from a NNU were not significantly different from the mothers who had standard postnatal care and were discharged home with their baby from the PNW.
- There were significant differences in the magnitude and pattern of mood change over time between the mothers who have their baby discharged from a NNU and the mothers who had standard postnatal care and were discharged home with their baby from the PNW.

**Conclusions on the extent of differences in the post discharge experiences of the neonatal unit mothers and the postnatal ward mothers**

- The extent of differences in the post discharge experiences of mothers who had their baby discharged from a NNU and mothers who were discharged home with their baby from the PNW were minimal. The NNU mothers had more contacts with health visitors and fewer consulted with a pharmacist for advice than the PNW mothers.
- Mothers and other baby carers were able to access baby care information and advice via the telephone. However, without the use of protocols some information given to callers was inconsistent, inaccurate and occasionally potentially dangerous.

**IMPLICATIONS OF THIS RESEARCH**

**Knowledge gained and issues raised by this research**

**The aims of this thesis**

There is no doubt in the literature that admission of a newborn baby to a NNU represents a crisis situation for most mothers (Caplan, 1960; Kaplan and Mason, 1960; Caplan et al. 1965; Benfield et al. 1976; Miles, 1989; Redshaw, 1997; Padden and Glenn, 1997). However, certainty about the continued effect on mothers of their experience following the discharge of their baby from a NNU is less clear. The findings of this study support the opinion that the negative impact on mothers of their baby's admission to a NNU does not, in the mid-term at least, remain acute following their baby's discharge home. Through the fulfilment of the three aims of this thesis, the findings of this study contribute to new knowledge and raise issues, which have implications for clinical practice and further research, about the population of mothers who take their baby home from a NNU.

### **Determining the effect of specific interventions on the mothers' anxiety and mood**

The principal aim of this thesis was -

**to determine the effect of specific interventions on the anxiety and mood states of mothers who had their baby discharged from a neonatal unit.**

The principal aim of this study was achieved through the evaluation of the effect on anxiety and mood of 'Baby Helpline' and 'Baby Check' as support interventions for mothers following their baby's discharge from a NNU. The findings showed that access to 'Baby Helpline' and or 'Baby Check' neither decreased nor increased anxiety or mood, or the magnitude of change in anxiety or mood over time. These were new findings that had not previously been described in the population of mothers who had their baby discharged from a NNU. However, the numbers of mothers in the study were small and the findings that access to 'Baby Helpline' and or 'Baby Check' showed no evidence of effect on anxiety or mood states should be treated with caution.

Even though, as described earlier in this chapter, there was evidence that anxiety in mothers decreased after their baby was discharged from a NNU it was anticipated that additional support interventions might enhance the process of recovery. The findings of this evaluation were therefore unexpected. From the discussion of possible methodological and contextual influences on the findings of the RCT, three potential explanations emerged to account for the findings that the interventions had no effect on the mothers' anxiety and mood states.

The first potential influencing factor was the 'Hawthorne effect' that may have generated positive feelings of support in mothers just by their participation in the study. The concept of the 'Hawthorne effect' can give health professionals strong messages about the positive value and power of mothers and others feeling cared about and participation. During their baby's stay in a NNU other researchers have shown mothers to become less anxious over time. Much of that reduction in anxiety was probably attributable to tangible evidence of their baby's improved health. However, mothers distinguish between gratitude to the neonatal team for saving the life of their baby and the neonatal team supporting them as individuals. If the philosophy of care of a NNU can incorporate strategies that enable mothers to feel supported and cared about and facilitate a culture of partnerships in care, the improvement in the mothers' anxiety and mood states during the period of admission and at the time of discharge home may be enhanced.

The second influencing factor considered was the lack of overt promotion by health care professionals of the interventions that may have diminished the mothers' perception of their value as means of support. This has implications for the methodology selected for future evaluations of support interventions at any stage of the mothers' experience of a NNU.

The third potential influencing factor was that the mothers did not actually require additional support interventions following their baby's discharge from a NNU. This may have been a reflection of the mothers' experience of the NNU or a reflection of adequate and appropriate community support. In terms of the mothers' anxiety and mood at the time of their baby's discharge home and at three months following their baby's discharge home being a reflection of the mothers' experience of a NNU, there are two possible interpretations which have implications for clinical practice. The mothers' perception of her experience of the NNU may have been very positive with good preparation for taking her baby home therefore there was no requirement for additional support interventions. However, it was also possible that the mothers' perception of the NNU was negative and discharge home signified removal from the physical and emotional stressors associated with the NNU and therefore promoted the reduction in anxiety and an improvement in mood seen in this study. It is, of course, possible that both positive and negative perceptions of their experience exist simultaneously within a group of mothers or within individuals.

This study has confirmed previous research findings that, following the discharge of their baby from a NNU, mothers' anxiety decreases and mood improves over time. As stated earlier, it has long been accepted in the literature that the admission of a baby to a NNU is a crisis event for many mothers. Therefore the issues that appear to require the attention of clinical practitioners and researchers are what interventions and practices before and during the baby's admission to a NNU might reduce mothers' anxiety and improve mood?

**Identification of the mothers' characteristics associated with their anxiety and mood**  
The second aim of this thesis was –

**to identify the characteristics of the neonatal unit mothers that appear to influence their anxiety and mood states.**

Achievement of the second aim of this thesis established a profile of the characteristics of mothers that influenced their anxiety and mood around the time of their baby's discharge from a NNU and up to three months following discharge.

For health care professionals, being able to identify the mothers most at risk of increased anxiety and low mood enables them to offer more individualised support to meet the specific needs of mothers and facilitate the appropriate use of resources. For example, this study demonstrated that the propensity for anxiety in NNU mothers was greatest in mothers who were young, not married or living with a partner and the less well educated. Therefore a focus for clinical development for neonatal nurses would be to develop strategies that reduce anxiety, provide support and facilitate positive management of anxiety with mothers who have a greater propensity towards anxiety.

This study showed that mothers' anxiety decreased and mood improved following their baby's discharge from the NNU. Although the support interventions had no effect on their anxiety and mood following their baby's discharge from the NNU, the magnitude of the change in anxiety and mood was greater for some mothers than others. Mothering experience and delivery type significantly influenced the magnitude of change in anxiety and mothering experience, delivery type and gestation at birth significantly influenced mood change. This knowledge has implications for the targeting of post discharge support by the primary health care team with mothers following their baby's discharge from a NNU.

In terms of clinical practice and future research on the NNU, the interesting findings from this aspect of the study were the characteristics of mothers that influenced their anxiety and mood around the time of their baby's discharge from the NNU.

In relation to anxiety, this study found that the NNU mothers were no more anxious than other women of a similar age around the time their baby was discharged from a NNU; a finding that was contrary to popular belief. However, first-time mothers and younger mothers were more anxious compared with experienced mothers and older mothers.

Around the time their baby was discharged from the NNU, the mood profile of NNU mothers was significantly lower than the normal values for British adults for all the mood states except the agreeable-hostile mood dimension. A combination of both mother and baby characteristics was shown to have significantly influenced the mothers' low mood states. Increasing maternal age, previous mothering experience and the experience of a

normal delivery compared with an instrumental or operative delivery might have been anticipated to have a relatively positive effect on mood. However some other characteristics, such as previous adverse obstetric events, low birth weight or prematurity, that influenced a more positive mood profile were unexpected and challenge some of our existing perceptions of the mothers in most need of emotional support around the time their baby is discharged from the NNU.

Mothers with experience of previous adverse obstetric events, which included stillbirth and baby deaths, were significantly more composed than mothers who had no previous experience of adverse obstetric events. This may have been due to the outcome of this pregnancy, a live baby, being so much better than their previous experience. In addition, however positively or negatively the mother interpreted her experience of her baby being in a NNU, she was about to take home a live baby, which may have exceeded her expectations during her pregnancy.

In terms of the significant baby characteristics that influenced mood, decreasing birth weight and gestation at birth, birth at 32 or less weeks gestation and or 1.5Kg or less birth weight, longer length of stay on the NNU and lower discharge weight all had a positive influence on the mothers' mood profile around the time their baby's was discharge from the NNU. However, overall the mood profile of the NNU mothers around the time their baby was discharged from the NNU was low. It appears therefore that the current practice of targeting additional support towards the mothers who delivered the earliest and smallest babies, who are also likely to stay longer in the NNU and be discharged home at a lower weight than other babies, may be missing a population of mothers in greater need.

The finding that the mood profile of NNU mothers was low around the time of their baby's discharge home was a slightly unexpected finding. Although the mothers' mood may have been affected by worrying thoughts about their baby's future health and development and their ability to care for their baby at home we might have expected to see a more positive mood profile marking the baby's survival and the major achievement of discharge from the NNU. However, we do not know from this study if the mothers' mood profile at discharge was an improvement or deterioration from their earlier mood profile. More research is therefore needed into the mood profile of mothers throughout their experience in a NNU and reviews of clinical practices around preparation for discharge and discharge practice are required to improve the mood of mothers' at the time of their baby's discharge home.

This study has identified the level of anxiety and mood and the characteristics that influenced anxiety and mood in mothers around the time their baby was discharged from a NNU. An avenue for future research would be to explore the characteristics and other factors that influence the change in anxiety and mood in mothers from the time of their baby's admission to a NNU through until discharge and beyond.

**Determining the extent of differences between neonatal unit mothers and postnatal ward mothers**

The third aim of this thesis was –

**to explore the extent of differences between mothers who had their baby discharged from a neonatal unit and mothers who were discharged home with their baby following standard postnatal care.**

The comparison study was devised to enable the findings relating characteristics, anxiety and mood of the NNU mothers to be located into the context of other new mothers. The observed lack of differences in the characteristics, anxiety and mood between the NNU mothers and the PNW mothers challenges popular perceptions.

There were few significant differences in the characteristics of the NNU mothers and the PNW mothers and past and present obstetric history appeared to be more discriminating than social factors. Based on the evidence of this research, some of the local assumptions about the characteristics, demographic and social profile of mothers who have their baby admitted to the NNU should be challenged.

The association between previous termination of pregnancy and premature birth in a subsequent pregnancy in the NNU mothers may assist in the antenatal identification of pregnant women who may be at increased risk of their baby being admitted to a NNU. In addition to obstetric interventions to prolong the pregnancy, if potential admissions to a NNU could be identified during the antenatal period then initiatives could be employed to prepare the mother for such an event.

There was no significant difference between the trait-anxiety of the NNU mothers and the PNW mothers. In addition, the NNU mothers were found to be no more anxious than the PNW mothers at the time of their baby's discharge, three months following discharge or for the magnitude of change in anxiety over time.

There were also no significant differences in the mood profiles of NNU mothers and PNW mothers at the time of their baby's discharge home or at one, two and three months following discharge however, there were some significant differences in the magnitude and pattern of mood change over time. The significant differences in mood change were positive for the NNU mothers and negative for the PNW mothers.

The assertion that additional support interventions to relieve anxiety and improve mood appear not to be required by mothers following their baby's discharge from a NNU was supported by the findings of the contemporaneous comparison study. However, the lack of difference in anxiety and mood between NNU and PNW mothers may also suggest the possibility that all new mothers need additional support interventions following discharge from hospital.

The argument against supporting the proposal that all new mothers might benefit from support interventions were the findings that neither the NNU mothers nor the PNW mothers were more anxious than other women of a similar age. The mood profile of the PNW mothers was also the same or better than the normal values for British adults, with the exception of the energetic-tired mood dimension.

However, supporting the argument for additional support interventions for all mothers is the evidence in the literature, which was supported by the findings of this research, that mothers worry about their baby's health, behaviour and care needs. There were no differences in the reported baby related worries, information needs or the health events experienced. Many of the mothers' worries and information needs related to feeding, elimination, respiratory function concerns and developmental or age appropriate behaviour issues. These appear to be recurring themes of concern for new mothers and the possibility exists that many issues could be addressed proactively by helping mothers develop transferable problem-solving techniques or refocusing professional hospital and community support for new mothers. The trend for new mothers to be geographically distanced from their extended family continues. Greater availability of nursery nurses in hospital and the community may help to provide mothers with valuable support and accurate information to address issues related to well baby care and normal baby behaviour.

Despite the number of reported worries and concerns of new mothers, the NNU mothers and the PNW mothers assessed themselves as 'moderately confident' in their ability to

deal with a series of baby care scenarios. Feeling confident about baby care was consistent with the findings of anxiety and mood in the NNU and the PNW mothers after discharge. There was no significant difference between the NNU mothers and the PNW mothers in their confidence to recognise when their baby was not well or their baby's ability to continue to breath day and night. Given that the factors associated with increased risk of sudden infant death are seen more frequently in babies who had been admitted to a NNU, similar levels of confidence in the NNU and PNW mothers was a surprising finding. However, the confidence in the NNU mothers may have been a reflection of parent education initiatives on the NNU that focus on the recognition of illness in a baby and reducing the risks of cot death.

Although the NNU mothers had more contacts with the primary health care team than the PNW mothers there were missed opportunities for health promotion, continuity of care and holistic support of new mothers.

Although after the birth of their baby many NNU mothers elect to stay in hospital, to remain near to their baby, longer than most PNW mothers, the majority of mothers would have been discharged home within the normal 10-day visiting period of the community midwife. However, only nine NNU mothers were visited at home by a community midwife compared with all the PNW mothers, except one who reported that she had been 'forgotten in error'. Given the role of community midwives and the continuous, women centred relationship that midwives are eager to develop with women throughout pregnancy and childbirth, it appears to be inconsistent that so few NNU mothers had postnatal contact with their community midwife. Although the NNU mothers would have seen a hospital based midwife daily until her 10<sup>th</sup> postnatal day, home visits by a community midwife would have been the normal expectation offering continuity of care and individual support. A new mother who has been discharged from hospital and has had to leave her sick baby in a NNU clearly has support needs. By not fulfilling the expectation of home visits, the community midwife runs the risk of inadvertently sending negative messages about the value of the postnatal woman without a baby and missing opportunities to support postpartum women in need.

The NNU and the PNW mothers were generally 'satisfied' or 'very satisfied' with the information and support they received from the primary health care team. However, the majority of the matched pairs of NNU mothers indicated that they were less satisfied than the PNW mothers with information and support from community midwives and general practitioners and also less satisfied with information from health visitors. The NNU mothers

expressed a need for quite specific information. It is unrealistic to expect the primary care team to be as informed about the needs and development of previously very premature and small babies as the neonatal care team. However, this issue could be addressed through joint education initiatives between the community health care team and the neonatal care team.

### **Reflections on ethical considerations**

Although the comparison study (part 1) received approval from the local Research Ethics Committee recognition of changes in the requirements for studies over the passage of time need to be considered. The two main issues for reflection are firstly, prior consent for participation in a study and secondly, a plan for follow-up of participants found to be in need of medical review or support.

In the comparison study (part 1) a random selection of NNU mothers and matched PNW mothers were sent questionnaires which focused on their level of confidence about baby care, their worries or concerns, sources of advice and support and their contacts with primary health care professionals. Consent to participate in the research project was deemed to have been given if the questionnaire was returned and no follow-up questionnaires or letters were sent to non-responders. However, although 80% of both the NNU mothers and the PNW mothers returned completed questionnaires this practice would no longer be ethically acceptable and would also contravene the Data Protection Act (1998). If the study were repeated, an initial letter informing mothers of the research project and inviting them to consent to participation in the study would be sent via their general practitioner. Only after receipt of a signed written consent would a questionnaire be posted to a mother.

In addition, if the study were repeated a clear strategy of actions to be taken in the event of a mother being identified, as a result of completing the questionnaire, as distressed or in need of medical, psychological or social support. Appropriate action may include contacting the mother's health visitor or general practitioner. The possibility of referral to the primary health care team for review would also need to be clearly stated in the mothers' information letter.

### **Recommendations for developments in clinical practice and further research**

Based on the evidence of this research, the introduction of 'Baby Helpline' and or 'Baby Check' as universal support interventions for all mothers who have their baby discharged

from a NNU cannot be recommended. However, the numbers of mothers in the study were small and the findings that access to 'Baby Helpline' and or 'Baby Check' showed no evidence of effect on anxiety or mood states should be treated with caution.

In order to ascertain if the findings related to the anxiety and mood states of mothers who had their baby discharged from a NNU were a function of the NNU where this study was located, aspects of this study could be replicated in other neonatal units.

Discharge from a NNU is a transitional milestone for both mother and baby. This study identify the characteristics of mothers who were more anxious and or had a lower mood profile around the time of their baby's discharge from a NNU, therefore strategies should be developed to enhance support and discharge preparation for those mothers. When planning the discharge of a baby, neonatal nurses and doctors also need to consider the psychological progress of the mother as well as her skills acquisition and the baby's achievement of appropriate feeding, temperature control, growth and good health.

Baby care worries and concerns seem to be inherent to new mothers. However, given the prolonged contact neonatal nurses have with mothers, interventions should be developed to not only prepare mothers for taking their baby home, but also to prepare them for the initial months at home with a baby who had a different beginning to life.

Parent education initiatives should be developed to include developmental issues to enable mothers to be more aware of age appropriate behaviour in premature infants.

Awareness should be enhanced amongst neonatal nurses, midwives and obstetricians of the prolonged influence of delivery type on the mood of NNU mothers. Issues requiring further research are an evaluation of the effect on the anxiety and mood of mothers of preparation for non-normal delivery when this can be anticipated and further evaluation of different postnatal support strategies following emergency interventions at delivery.

The findings in this research that the NNU mothers and the PNW mothers have different patterns of mood change following their baby's discharge home has implications for the patterns of support offered by the primary care team and health visitors and community midwives in particular. The potential for developing a greater role for nursery nurses in hospitals and the community should be explored.

Even though, based on the evidence of this research, the development of 'Baby Helpline' cannot be supported, unsolicited telephone calls to the NNU requesting support and baby health care information and advice for non-resident babies are still likely to continue.

Therefore, based on the knowledge gained from this study, all telephone calls to the NNU requesting information about care, treatment or management of any non-resident baby should be fully documented. All information and advice given should be derived from evidence based protocols. This telephone log should be subject to regular audit so that recurring issues can be incorporated into the pre-discharge preparation of mothers.

To promote continuity of care following discharge home from the postnatal ward, mothers should be encouraged to contact their community midwife rather than telephone the postnatal ward for advice, information or support up to the tenth postpartum day.

To ensure that the relevant messages from past as well as current research are not overlooked by clinicians, NNU based journal or research meetings should be multidisciplinary, broad based and include research that focuses on the psychological needs of mothers and babies as well as the clinical management of sick babies.

This research has shown evidence that, around the time of their baby's discharge home, some mothers were more anxious or had lower mood states than other NNU mothers. Further research is required to identify if these differences can be minimised by nursing interventions developed to prepare mothers for taking their baby home, for example a focus on an individual needs assessment based on the mothers own identified learning needs rather than a checklist of tasks to be accomplish.

This study has identified a profile of mothers who were more anxious and had lower mood states around the time of their baby's discharge from a NNU. Further research is required to identify the extent and pattern of anxiety and mood change in mothers during their baby's stay in a NNU.

The findings of this study will enable further research projects and support interventions to be targeted to the most vulnerable mothers. This research adopted a mid-term (three month) view of post discharge support. The mood profile of the NNU mothers shifted from being predominately negative around the time of discharge to predominately positive one month after discharge. Therefore further research is required to look more closely at the

anxiety, mood and experiences of mothers during the first month at home following discharge from the NNU that was not captured by this study.

Further research is required to identify antenatal strategies that might reduce the distress of mothers if their baby is admitted to a NNU. In addition, the effectiveness of antenatal support strategies already developed to prepare at-risk mothers for their baby's admission to a NNU should be evaluated.

The findings of the evaluation of 'Baby Helpline' and 'Baby Check' as support interventions for mothers following their baby's discharge from a neonatal unit has demonstrated the need for all new interventions in health care to be evaluated and for clinical practice to be evidence-based.

**BABY HELPLINE PROTOCOL****COLIC**

The terms 'colic', '3 month colic' or 'evening colic' are sometimes applied to any prolonged crying in an otherwise healthy baby. Many infants have unsettled periods, especially in the evening and cry for long periods of time, drawing up their legs as if in pain. The baby is obviously in some discomfort and parents fear there is something very wrong with their baby. It is distressing for parents to be unable to relieve their baby's pain and they need lots of reassurance. Colic is not really very well understood and there are various theories as to its cause and management. Infants may cry simply because they become over tired at the end of the day. The condition is self-limiting over time.

**CHARACTERISTICS**

- ◆ Usually begins within 2 -3 weeks post term, peaks at about 6 weeks but can last to 3 - 4 months of age.
- ◆ Described as persistent, inconsolable crying for longer than 3 hours per day occurring more than 3 times per week.
- ◆ May draw up legs to chest and appear to be straining. These episodes may be followed by burping and passing rectal wind.
- ◆ Baby is active, alert and does not look sick.
- ◆ Baby may seem to be hungry all the time.

**SCREENING QUESTIONS**

- ◆ Age of baby?
- ◆ Feeding - method and any change in pattern?
- ◆ Bowels- frequency? - characteristics of stools?
- ◆ Vomiting -duration?  
-frequency?  
-colour/nature?  
-amount?
- ◆ Appearance -during attack?  
-description of behaviour?  
-crying pattern- time of day?  
-duration of crying?  
-how does baby look when not crying?  
-does baby look sick?
- ◆ Factors which relieve or intensify attack?
- ◆ How are parents coping with crying infant?

**MANAGEMENT**

- a **Reassurance.**
  - ◆ Reassure parents that it is not their fault and that the condition is self limiting.
  - ◆ Colic pains cause no harm and the baby will thrive.
- b **Baby Care.**
  - ◆ Check infant is not too hot or cold.
  - ◆ Ensure nappy clean and dry.
  - ◆ Offer a pacifier for comfort (not the type than contains a drink)
  - ◆ Wrap firmly in a shawl or sheet and cuddle baby.
- c **General**
  - ◆ Gripe water and 'colic drops' are not recommended because they have no proven value.
  - ◆ Hold baby as much as possible, especially when not crying. A sling or baby carrier may be useful while doing household chores.
  - ◆ Darken the bedroom use a night light only.
  - ◆ Take a break from child care and do not feel guilty.
  - ◆ 'Colic' is often very distressing for parents. Encourage parents to speak to their Health Visitor about management and coping mechanisms.
- d **Feeding.**
  - ◆ Check that the infant is well positioned during and after feeds.

**Bottle feeding**

  - ◆ Offer artificially fed babies more frequent feeds of a reduced amount, but maintaining the same total volume.
  - ◆ Offer artificially fed babies small amounts of warm, previously boiled water, by teaspoon.

**Breast feeding**

  - ◆ Avoid excessive stimulants such as caffeine and alcohol whilst breast feeding.
  - ◆ If feeding both sides - try one side only per feed. This gives a higher fat content feed which slows the passage of food through the digestive system. If the milk supply is ample then 2 sided feeding can give a high lactose feed which causes problems in the small intestine.
  - ◆ If feeding 1 side per feed - try 2 sides per feed.
- e **Maternal**
  - ◆ Cut out smoking or confine smoking to another room.
  - ◆ Try to create a calm environment and avoid over stimulating baby at the troublesome time of day.

**References:**

*Guidelines for Feeding Under Fives. (1992) Southampton & South West Hampshire Health Authority.*

*Brown, J. L. (1989) Pediatric Telephone Medicine: Principles, Triage and Advice. J. B. Lippincott, Philadelphia.*

*Polnay, L., Hull D. (1993) Community Paediatrics. Churchill Livingstone, London.*

March 1995

## **BABY HELPLINE PROTOCOL**

### **CONSTIPATION**

**Constipation is the passage of hard stools which cause straining and discomfort.**

- ◆ Normal bowel frequency may vary from several stools per day to 4 - 5 days between stools.
- ◆ Breast fed babies may go 7 - 10 days between stools. This is normal if stool is soft.
- ◆ Infants are not constipated if stools are soft but passed infrequently.
- ◆ Constipation is more common in bottle fed babies. Contributory factors may be over concentrated milk feeds or inadequate fluid intake.
- ◆ Grunting, straining and facial grimaces with drawing legs up before passing a soft stool is normal for infants under 6 months.

**BEFORE ADVISING TREATMENT MAKE SURE, BY TAKING A HISTORY, THAT THE INFANT IS REALLY CONSTIPATED.**

#### **SCREENING QUESTIONS**

- ◆ Age of baby?
- ◆ Usual frequency and consistency of stool?
- ◆ Has there been any change in the frequency and consistency of stools?
- ◆ When was the last stool passed?
- ◆ Description of stool?
  - colour?
  - consistency?
  - presence of blood mixed with stool or streaked on stool?
- ◆ Describe baby's behaviour while passing a stool?
- ◆ Method of feeding? -any changes?
- ◆ Frequency of feeds? -any changes?
- ◆ If bottle feeding - check concentration of milk?
- ◆ Any previous history of constipation?
- ◆ Any other health problems?
- ◆ Is baby being given any medication?
- ◆ What treatment has been tried so far?

**MANAGEMENT OPTIONS**

- ◆ Constipation with other symptoms such as hard distended abdomen, vomiting, blood mixed in with stool or fever call GP or attend A & E.
- ◆ Blood streaked over stool - visit GP to check for fissure.
- ◆ Constipation may be prevented by offering cooled, boiled water at regular intervals to bottle fed babies. Start with 2 teaspoons twice daily and observe stools. Discuss progress with Health Visitor.
- ◆ Constipation may be initially treated by giving unsweetened fruit juice in water in the dilution 1 : 6 (eg. 1tsp fresh orange juice diluted in 1 oz/30 ml of cooled boiled water). Can be given at any age. Start with 2 teaspoons twice daily and observe stools. Discuss progress with Health Visitor.
- ◆ Sugary drinks are not recommended, however in severe cases of constipation a sugar solution of sugar in water in a dilution of 1 : 6 offered on a spoon may be effective.
- ◆ Start with 2 teaspoons of solution twice daily and observe stools. Discuss progress with Health Visitor.
- ◆ **Over the counter treatments for constipation such as 'Syrup of Figs' and 'Milk of Magnesia' are dangerous to infants and must not be used.**
- ◆ In older infants advice should include high-fibre foods in the diet eg. wholemeal bread, cereals, fruit and vegetables. Never advise pure bran as it provides unnecessary bulk, reduces the energy density of the diet and interferes with the adsorption of essential minerals.
- ◆ Repeated episodes of constipation - discuss feeding and diet with Health Visitor.

**References:**

*Guidelines for Feeding Under Fives (1992) Southampton and South West Hampshire Health Authority*

*Polnay, L., Hull, D. (1993) Community Paediatrics. Churchill Livingstone, London.*  
*March 1995*

APPENDIX 3

BABY HELPLINE CALL SHEET

Name	Phone No.	Date Time	Answerphone call back time
------	-----------	--------------	-------------------------------

Mother      Father      Grandparent      GP      HV      CM      other \_\_\_\_\_

Baby's name	Chron. Age Correc. Age	M / F	BW Kg BW lbs	PW Kg PW lbs
-------------	---------------------------	----------	-----------------	-----------------

Presenting Concerns / Information Requested : \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Previous contacts	None	GP x	HV x	CM x	Other
Date(s)					

Management to date : \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Medicines	None	Prescription	OTC
-----------	------	--------------	-----

Past Medical History : \_\_\_\_\_

NNU    NO/YES

\_\_\_\_\_

\_\_\_\_\_

Nursing Assessment : \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Health Promotion/Advice/Information : \_\_\_\_\_

Protocol(s)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Referral	GP	HV	CM	IFS	A & E	Other
Priority	Urgent	Call out		Appointment	ASAP	

Call back: - if remain concerned  Follow up required NO / YES      Time arranged:  
- require more info.

Signature:      Call number:      Time call finished:

**APPENDIX 4**

**CONSENT FORM FOR HEALTH DIARY**

*Hospital letter head*

**MATERNAL SUPPORT AFTER DISCHARGE FROM THE NEONATAL UNIT  
RESEARCH PROJECT**

The details and purpose of this study have been explained to me / us by ..... and I / we voluntarily give my / our consent to participate in the study. I / we understand that this involves the following:

- 1 Filling in a Health Diary every day for one month following my / our baby's discharge from the Neonatal Unit, .....Hospital.
- 2 Returning the completed Health Diary using the stamped and addressed envelope provided.
- 3 Filling in a short questionnaire about the Health Diary at the end of the study.
- 4 The information obtained from the Health Diary will be made available to the research team in confidence.

I / we understand that I / we shall be free to withdraw from this study at any time, without detriment to my / our baby's medical care.

Signed: \_\_\_\_\_

Relationship to baby: \_\_\_\_\_

Witness: \_\_\_\_\_

Date: \_\_\_\_\_

## APPENDIX 5

### LETTER TO NEONATAL UNIT MOTHERS

*Hospital letter head*

Direct dial telephone numbers

REF No: PS/NNU/

18<sup>th</sup> January 1994

Dear

As part of a research project looking at improving support for parents following their baby's discharge from the Neonatal Unit we are trying to gather information from parents who have already undergone this experience, and would very much appreciate your help.

We are particularly interested in any problems, worries or concerns which you may have experienced in the first few weeks following your baby's discharge from the Neonatal Unit. In addition, we are also interested to discover more about those early weeks at home, for you and your baby, and the people who were able to offer you the most appropriate information and support.

We would like to ask you if you would be willing to complete a questionnaire. We quite understand that you may not wish to participate in this project, in which case please rest assured that any hospital follow-up which your baby receives will not be affected in any way.

If however you feel able to help us gather this important information which, we hope, will enable us to improve parental access to information and support, please complete the enclosed questionnaire and return it to me using the stamped and addressed envelope provided by 1<sup>st</sup> February 1994. There are 5 sections to the questionnaire so please remember to check that you have answered all the questions.

I would like to take this opportunity to assure you that all information given by you will be treated in the strictest confidence.

If you would like more information or to discuss any part of this project please do not hesitate to contact me. Thanking you in anticipation of your assistance.

Yours sincerely

Chris Newsome  
Research Nurse

**LETTER TO POSTNATAL WARD MOTHERS**

***Hospital letter head***

Direct dial telephone numbers

REF No: PS/CG /

18<sup>th</sup> January 1994

Dear

As part of a research project looking at improving support for parents following their baby's discharge from the Maternity Hospital we are trying to gather information from parents who have already undergone this experience, and would very much appreciate your help.

We are particularly interested in any problems, worries or concerns which you may have experienced in the first few weeks following your baby's discharge from the Maternity Hospital. In addition, we are also interested to discover more about those early weeks at home, for you and your baby, and the people who were able to offer you the most appropriate information and support.

We are writing to a number of randomly selected mothers and would like to ask you if you would be willing to complete a questionnaire. We quite understand that you may not wish to participate in this project, in which case please rest assured that any hospital follow-up which your baby may receive will not be affected in any way.

If however you feel able to help us gather this important information which, we hope, will enable us to improve parental access to information and support, please complete the enclosed questionnaire and return it to me using the stamped and addressed envelope provided by 1<sup>st</sup> February 1994. There are 5 sections to the questionnaire so please remember to check that you have answered all the questions.

I would like to take this opportunity to assure you that all information given by you will be treated in the strictest confidence.

If you would like more information or to discuss any part of this project please do not hesitate to contact me. Thanking you in anticipation of your assistance.

Yours sincerely

Chris Newsome  
Research Nurse

## APPENDIX 6

### **POSTAL QUESTIONNAIRE FOR NEONATAL UNIT MOTHERS**

#### **MATERNAL SUPPORT AFTER DISCHARGE FROM THE NEONATAL UNIT**

**PLEASE ANSWER ALL QUESTIONS**

**REF: PS/NNU/**

#### **SECTION 1 QUESTIONS ABOUT YOUR BABY:**

1 Is your baby a boy or girl? ***Please tick a box***      Boy       Girl

2 How many weeks pregnant were you when your baby was born? \_\_\_\_\_ weeks

3 Why was your baby admitted to the Neonatal Unit? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4 How old is your baby now? \_\_\_\_\_ weeks

5 How long has your baby been discharged from the Neonatal Unit \_\_\_\_\_ weeks

#### **SECTION 2 QUESTIONS ABOUT BEING AT HOME IMMEDIATELY AFTER YOUR BABY WAS DISCHARGED FROM THE NEONATAL UNIT:**

***PLEASE CIRCLE THE NUMBER WHICH MOST CLOSELY REFLECTS HOW YOU FELT***

SCALE =      not confident      = 1  
                 slightly confident      = 2  
                 moderately confident      = 3  
                 very confident      = 4

6 Immediately following your baby's discharge from the Neonatal Unit, how confident did you feel about:-

a your baby remaining well?      1      2      3      4  
b you recognising when your baby was not well?      1      2      3      4  
c being able to care for your baby on your own?      1      2      3      4  
d giving medicines to your baby?      1      2      3      4  
e what to do if your baby would not feed?      1      2      3      4  
f what to do if your baby would not stop crying?      1      2      3      4  
g what to do if your baby vomited back medicines?      1      2      3      4  
h what to do if your baby vomited an entire feed?      1      2      3      4  
i your baby's ability to continue to breath day and night?      1      2      3      4  
j what to do if your baby stopped breathing?      1      2      3      4

***Please turn over the page***

**SECTION 3 QUESTIONS ABOUT ANY PROBLEMS, WORRIES OR CONCERNS  
THAT YOU MAY HAVE EXPERIENCED DURING THE WEEKS SINCE  
YOUR BABY WAS DISCHARGED FROM THE NEONATAL UNIT:**

7 Have you been concerned about your baby's health at any time since being discharged from the Neonatal Unit?

***Please tick a box*** NO  YES

8 If YES, ***please list or describe your concerns***

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9 Have you, at any time since your baby's discharge from the Neonatal Unit, had any queries or questions about baby care routines?

***Please tick a box*** NO  YES

10 If YES, ***please list or describe the type of queries you had.***

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11 Since your baby was discharged from the Neonatal Unit, has your baby ever experienced any of the following?

***Please tick boxes***

a	reluctant to feed?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
b	repeated vomiting?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
c	bleeding from the cord (tummy button)?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
d	colic?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
e	sticky eye?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
f	poor weight gain?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
g	constipation?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
h	runny bowel motions/diarrhoea?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
i	rash?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
j	unusual or persistent crying?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
k	floppiness?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
l	colour changes e.g. pale or blueness?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
m	jaundice(yellowness of the skin)?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
n	noisy or difficult breathing?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
o	feeling too hot or too cold?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
p	runny or blocked nose?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
q	increased irritability?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
r	increased sleepiness?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
s	decreased activity?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
t	just not being him or her self?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
u	unusual movements?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
v	cough?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
w	nappies less wet than usual?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
x	lump in groin?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>

***Please turn over the page***

**SECTION 4 QUESTIONS ABOUT WHO YOU CONTACT FOR INFORMATION,  
ADVICE AND/OR SUPPORT:**

12 If, or when, you have any questions, worries or concerns about your baby who do, or would, you contact for help and advice? **Please list**

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13 Since your baby was discharged home from the Neonatal Unit have you ever contacted the Neonatal Unit for information or advice? **Please tick a box**

a by telephone NO  YES   
b personal visit to the Neonatal Unit NO  YES

14 After your baby was born, were you visited at home by your Community Midwife?

**Please tick a box**      NO       YES

**IF NO, PLEASE GO TO QUESTION 17**

15 If YES (to question 14), when you asked your midwife for information or advice about your baby's care or health do you think she appreciated:- ***Please tick a box***

a your level of concern?  
NO  YES  SOMETIMES

b that your baby had been born early or unwell?  
NO  YES  SOMETIMES

c that your baby was or had been on the Neonatal Unit?  
NO  YES  SOMETIMES

16 When you spoke with your Community Midwife, about your baby, how satisfied were you with :-

*Please circle the number which most closely matches how you felt*

**SCALE= 1 = very dissatisfied, 2 = dissatisfied, 3 = satisfied, 4 = very satisfied**

a	the information you were given?	1	2	3	4
b	the support you received?	1	2	3	4

*Please turn over the page*

Appendix 6 continued

17 Since your baby was discharged from the Neonatal Unit how many times have you had contact with your Health Visitor? ***Please try to be as accurate as you can and put a number in the box***

- a Health Visitor called to your home \_\_\_\_\_
- b you attended the Health Visitor's Clinic \_\_\_\_\_
- c you telephoned the Health Visitor \_\_\_\_\_
- d your Health Visitor telephoned you \_\_\_\_\_

18 When you asked your Health Visitor for information about your baby's care or health do you think she appreciated :- ***Please tick a box***

- a your level of concern?

NO  YES  SOMETIMES

- b that your baby had been born early or unwell?

NO  YES  SOMETIMES

- c that your baby was or had been on the Neonatal Unit?

NO  YES  SOMETIMES

19 When you spoke with your Health Visitor, how satisfied were you with:-  
***Please circle the number which most closely matches how you felt***

**SCALE= 1 = very dissatisfied, 2 = dissatisfied, 3 = satisfied, 4 = very satisfied**

- a the information you were given? 1 2 3 4
- b the support you received? 1 2 3 4

20 Since your baby was discharged from the Neonatal Unit, how much contact have you with your family doctor/General Practitioner (GP)? ***Please try to be as accurate as you can and put a number in the box***

- a GP visited baby at home? \_\_\_\_\_
- b you took baby to see GP? \_\_\_\_\_
- c you telephoned GP? \_\_\_\_\_

***Please turn over the page***

Appendix 6 continued

21 When you asked your GP for information or advice about your baby's care or health do you think she/he appreciated:- ***Please tick boxes***

a your level of concern?

NO	<input type="checkbox"/>	YES	<input type="checkbox"/>	SOMETIMES	<input type="checkbox"/>
----	--------------------------	-----	--------------------------	-----------	--------------------------

b that your baby had been born early or small?

NO	<input type="checkbox"/>	YES	<input type="checkbox"/>	SOMETIMES	<input type="checkbox"/>
----	--------------------------	-----	--------------------------	-----------	--------------------------

c that your baby had been on the Neonatal Unit?

NO	<input type="checkbox"/>	YES	<input type="checkbox"/>	SOMETIMES	<input type="checkbox"/>
----	--------------------------	-----	--------------------------	-----------	--------------------------

d that your baby had not been home very long?

NO	<input type="checkbox"/>	YES	<input type="checkbox"/>	SOMETIMES	<input type="checkbox"/>
----	--------------------------	-----	--------------------------	-----------	--------------------------

22 When you spoke with your GP, how satisfied were you with:-  
***Please circle the number which most closely matches how you felt***  
**SCALE= 1 = very dissatisfied, 2 = dissatisfied, 3 = satisfied, 4 = very satisfied**

a the information you were given? 1 2 3 4

b the support you received? 1 2 3 4

23 Have you ever contacted any of the following for information or advice about your baby's care or health? ***Please tick boxes***

a chemist / pharmacist? NO  YES

b ambulance service? NO  YES

c member of your family? NO  YES

d friend or neighbour? NO  YES

e postnatal ward at the hospital? NO  YES

f casualty department? NO  YES

g telephone helpline? NO  YES

h parents' group? NO  YES

i community midwife? NO  YES

j community paediatric nurse? NO  YES

k other? ***Please specify***-----NO  YES

24 Since your baby was discharged from the Neonatal Unit, who are the people you have found to be most informative about your baby's health and care?  
***Please list***

---

---

***Please turn over the page***

25 Since your baby was discharged from the Neonatal Unit, who have you found has given YOU most support? ***Please list***

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---

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26 If there was a telephone helpline specifically for parents whose baby had previously been on the Neonatal Unit, do you think you would use it to obtain information or advice about your baby's health or care? ***Please tick a box***

NO  YES  MAYBE

**SECTION 5 QUESTIONS ABOUT YOU:**

27 What is your age? \_\_\_\_\_ years

28 If asked, would you be willing to be interviewed about the design of this questionnaire and the ease or difficulty experienced when filling it in?

***Please tick a box*** NO  YES

29 Do you have access to a telephone within your home?

***Please tick a box*** NO  YES

30 What was or is your occupation? \_\_\_\_\_

31 When you finished your education, did you have :-

a no qualifications

b CSEs

c O Levels

d GCSEs

e A Levels

f Degree

g Other ***please specify***  \_\_\_\_\_

32 Please make any other comments you would like to make

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**THANK YOU FOR COMPLETING THIS QUESTIONNAIRE  
PLEASE RETURN IT USING  
THE STAMPED AND ADDRESSED ENVELOPE PROVIDED**

**POSTAL QUESTIONNAIRE FOR POSTNATAL WARD MOTHERS****MATERNAL SUPPORT AFTER DISCHARGE FROM THE MATERNITY UNIT****PLEASE ANSWER ALL QUESTIONS****REF: PS/CG /****SECTION 1 QUESTIONS ABOUT YOUR BABY:**

1 Is your baby a boy or girl? *Please tick a box*      Boy       Girl

2 How many weeks pregnant were you when your baby was born? \_\_\_\_\_ weeks

3 How old was your baby when you were both discharged home from the Maternity Hospital? \_\_\_\_\_ weeks

4 How old is your baby now? \_\_\_\_\_ weeks

**SECTION 2 QUESTIONS ABOUT BEING AT HOME IMMEDIATELY AFTER YOUR BABY WAS DISCHARGED FROM THE MATERNITY UNIT:*****PLEASE CIRCLE THE NUMBER WHICH MOST CLOSELY REFLECTS HOW YOU FELT***

**SCALE =**

not confident	= 1
slightly confident	= 2
moderately confident	= 3
very confident	= 4

5 Immediately following your baby's discharge from the Maternity Hospital, how confident did you feel about:-

a your baby remaining well?	1	2	3	4
b you recognising when your baby was not well?	1	2	3	4
c being able to care for your baby on your own?	1	2	3	4
d giving medicines to your baby?	1	2	3	4
e what to do if your baby would not feed?	1	2	3	4
f what to do if your baby would not stop crying?	1	2	3	4
g what to do if your baby vomited back medicines?	1	2	3	4
h what to do if your baby vomited an entire feed?	1	2	3	4
i your baby's ability to continue to breath day and night?	1	2	3	4
j what to do if your baby stopped breathing?	1	2	3	4

*Please turn over the page*

**SECTION 3 QUESTIONS ABOUT ANY PROBLEMS, WORRIES OR CONCERNS  
THAT YOU MAY HAVE EXPERIENCED DURING THE WEEKS SINCE  
YOUR BABY WAS DISCHARGED FROM THE MATERNITY HOSPITAL:**

6 Have you been concerned about your baby's health at any time since being discharged from the Maternity Hospital?

*Please tick a box*

NO

YES

7 If YES, *please list or describe your concerns*

---



---



---

8 Have you, at any time since your baby's discharge from the Maternity Hospital, had any queries or questions about baby care routines?

*Please tick a box*

NO

YES

9 If YES, *please list or describe the type of queries you had.*

---



---



---

10 Since your baby was discharged from the Maternity Unit, has your baby ever experienced any of the following? *Please tick boxes*

a	reluctant to feed?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
b	repeated vomiting?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
c	bleeding from the cord (tummy button)?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
d	colic?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
e	sticky eye?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
f	poor weight gain?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
g	constipation?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
h	runny bowel motions/diarrhoea?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
i	rash?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
j	unusual or persistent crying?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
k	floppiness?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
l	colour changes e.g. pale or blueness?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
m	jaundice(yellowness of the skin)?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
n	noisy or difficult breathing?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
o	feeling too hot or too cold?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
p	runny or blocked nose?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
q	increased irritability?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
r	increased sleepiness?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
s	decreased activity?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
t	just not being him or her self?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
u	unusual movements?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
v	cough?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
w	nappies less wet than usual?	NO <input type="checkbox"/>	YES <input type="checkbox"/>
x	lump in groin?	NO <input type="checkbox"/>	YES <input type="checkbox"/>

*Please turn over the page*

**SECTION 4 QUESTIONS ABOUT WHO YOU CONTACT FOR INFORMATION,  
ADVICE AND/OR SUPPORT:**

11 If, or when, you have any questions, worries or concerns about your baby who do, or would, you contact for help and advice? ***Please list***

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---

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12 Since your baby was discharged home from the Maternity Hospital have you ever contacted the Maternity Hospital for information or advice? ***Please tick a box***

a by telephone NO  YES   
b personal visit to the Maternity Hospital NO  YES

13 After your baby was born, were you visited at home by your Community Midwife?

**Please tick a box** NO  YES

**IF NO, PLEASE GO TO QUESTION 16**

14 If YES (to question 13), when you asked your midwife for information or advice about your baby's care or health do you think she appreciated your level of concern?

**Please tick a box** NO  YES  SOMETIMES

15 When you spoke with your Community Midwife, about your baby, how satisfied were you with :-

*Please circle the number which most closely matches how you felt*  
SCALE= 1 = very dissatisfied, 2 = dissatisfied, 3 = satisfied, 4 = very satisfied

a	the information you were given?	1	2	3	4
b	the support you received?	1	2	3	4

16 Since your baby was discharged from the Maternity Hospital how many times have you had contact with your Health Visitor? ***Please try to be as accurate as you can and put a number in the box***

- a Health Visitor called to your home \_\_\_\_\_
- b you attended the Health Visitor's Clinic \_\_\_\_\_
- c you telephoned the Health Visitor \_\_\_\_\_
- d your Health Visitor telephoned you \_\_\_\_\_

*Please turn over the page*

**Appendix 7 continued**

17 When you asked your Health Visitor for information about your baby's care or health do you think she appreciated your level of concern?

***Please tick a box*** NO  YES  SOMETIMES

18 When you spoke with your Health Visitor, how satisfied were you with:-

***Please circle the number which most closely matches how you felt***

**SCALE= 1 = very dissatisfied, 2 = dissatisfied, 3 = satisfied, 4 = very satisfied**

a	the information you were given?	1	2	3	4
b	the support you received?	1	2	3	4

19 Since your baby was discharged from the Maternity Hospital, how much contact have you with your family doctor/General Practitioner (GP)? ***Please try to be as accurate as you can and put a number in the box***

a	GP visited baby at home?	_____
b	you took baby to see GP?	_____
c	you telephoned GP?	_____

20 When you asked your GP for information or advice about your baby's care or health do you think she/he appreciated your level of concern?

***Please tick a box*** NO  YES  SOMETIMES

21 When you spoke with your GP, how satisfied were you with:-

***Please circle the number which most closely matches how you felt***

**SCALE= 1 = very dissatisfied, 2 = dissatisfied, 3 = satisfied, 4 = very satisfied**

a	the information you were given?	1	2	3	4
b	the support you received?	1	2	3	4

***Please turn over the page***

Appendix 7 continued

22 Have you ever contacted any of the following for information or advice about your baby's care or health? ***Please tick boxes***

a	chemist / pharmacist?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
b	ambulance service?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
c	member of your family?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
d	friend or neighbour?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
e	postnatal ward at the hospital?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
f	casualty department?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
g	telephone helpline?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
h	parents' group?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
i	community midwife?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
j	community paediatric nurse?	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>
k	other? <b><i>Please specify</i></b> _____	NO	<input type="checkbox"/>	YES	<input type="checkbox"/>

23 Since your baby was discharged from the Maternity Hospital, who are the people you have found to be most informative about your baby's health and care?

***Please list***

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24 Since your baby was discharged from the Maternity Hospital, who have you found has given YOU most support?

***Please list***

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25 If there was a telephone helpline for parents, do you think you would use it to obtain information or advice about your baby's health or care?

***Please tick a box***   NO      YES      MAYBE  

***Please turn over the page***

**SECTION 5 QUESTIONS ABOUT YOU:**

26 What is your age? \_\_\_\_\_ years

27 If asked, would you be willing to be interviewed about the design of this questionnaire and the ease or difficulty experienced when filling it in?

***Please tick a box***

NO

YES

28 Do you have access to a telephone within your home?

***Please tick a box***

NO

YES

29 What was or is your occupation? \_\_\_\_\_

30 When you finished your education, did you have :-

a no qualifications

b CSEs

c O Levels

d GCSEs

e A Levels

f Degree

g Other ***please specify***  \_\_\_\_\_

31 Please make any other comments you would like to make

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**THANK YOU FOR COMPLETING THIS QUESTIONNAIRE**

**PLEASE RETURN IT USING  
THE STAMPED AND ADDRESSED ENVELOPE PROVIDED**

## APPENDIX 8

### **HEALTH DIARY INSTRUCTIONS AND DIARY PAGES**

Dear

Thank you for agreeing to take part in this research project.

We would like to ask you to fill in this Health Diary every day for one month. There are 8 questions on two facing pages for each day.

Please fill in your baby's Health Diary every day, even if you have not had any worries or concerns about your baby's health or needed any extra information about baby care. If, by chance, you miss a few days, but wish to continue helping with this project, please start again on the correct date and ignore the missed days. It may help you to remember if you fill in the Health Diary at roughly the same time each day, for example every evening.

We will send you a stamped and addressed envelope at the end of the month and would be extremely grateful if you would post the Health Diary back to us.

If you have any queries or concerns about this Health Diary please telephone Chris Newsome on 0703 796009

Thank you once again for your help.

## HEALTH DIARY

Date:

We would like to start with a few questions about your baby's health and behaviour.

1 In the last 24 hours, how worried have you felt about your baby's health and behaviour?

*Please circle your answer*

Not at all worried

1 2 3 4

Very worried

2 Please give brief details of your worries or concerns.

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3 Please indicate below:-

a Who you contacted for advice or support? ***Please tick a box or boxes***

b How satisfied were you with the advice or support you received?

**SCALE**

**1 = very dissatisfied**

**2 = generally dissatisfied**

**3 = generally satisfied**

**4 = very satisfied**

*Please circle your answer*

No one	<input type="checkbox"/>	1	2	3	4
Partner	<input type="checkbox"/>	1	2	3	4
Family member	<input type="checkbox"/>	1	2	3	4
Friend	<input type="checkbox"/>	1	2	3	4
Chemist/Pharmacist	<input type="checkbox"/>	1	2	3	4
Practice Nurse	<input type="checkbox"/>	1	2	3	4
Baby Helpline	<input type="checkbox"/>	1	2	3	4
Health Visitor	<input type="checkbox"/>	1	2	3	4
Family Doctor/GP	<input type="checkbox"/>	1	2	3	4
Paediatric Nurse	<input type="checkbox"/>	1	2	3	4
Community Midwife	<input type="checkbox"/>	1	2	3	4
Hospital Doctor	<input type="checkbox"/>	1	2	3	4
Other <b><i>please specify</i></b>	<input type="checkbox"/>	1	2	3	4

4 How did the advice or support you were given affect the way you looked after your baby today?

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## Appendix 8 continued

We would now like to ask a few questions about your information needs.

5 In the last 24 hours, have you wanted any extra information about your baby or babies in general?

***Please circle your answer***

**YES / NO**

6 Please give brief details of your information needs.

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7 Please indicate below:-

a Who you contacted for information? ***Please tick a box or boxes***

b How satisfied were you with the information you received?

**SCALE =**

<b>1 = very dissatisfied</b>
<b>2 = generally dissatisfied</b>
<b>3 = generally satisfied</b>
<b>4 = very satisfied</b>

***Please circle your answer***

No one	<input type="checkbox"/>	1	2	3	4
Partner	<input type="checkbox"/>	1	2	3	4
Family member	<input type="checkbox"/>	1	2	3	4
Friend	<input type="checkbox"/>	1	2	3	4
Chemist/Pharmacist	<input type="checkbox"/>	1	2	3	4
Practice Nurse	<input type="checkbox"/>	1	2	3	4
Baby Helpline	<input type="checkbox"/>	1	2	3	4
Health Visitor	<input type="checkbox"/>	1	2	3	4
Family Doctor/GP	<input type="checkbox"/>	1	2	3	4
Paediatric Nurse	<input type="checkbox"/>	1	2	3	4
Community Midwife	<input type="checkbox"/>	1	2	3	4
Hospital Doctor	<input type="checkbox"/>	1	2	3	4
Other <b><i>please specify</i></b>	<input type="checkbox"/>	1	2	3	4

8 How did the information you were given affect the way you looked after your baby today?

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**NEONATAL UNIT MOTHERS EXCLUDED FROM RECRUITMENT**  
**TO THE MAIN STUDY**

**Neonatal Unit mothers excluded from recruitment to the randomised controlled trial (n=84)**

<b>Exclusion criteria</b>	<b>Number</b>
Mothers of babies who would receive out of district primary care	30
Mothers of babies transferred for general or cardiac surgery	27
Mothers unable to complete the outcome measures due to communication difficulties	7
Mothers of multiple births when not all babies were admitted to NNU	7
Maternal drug or substance abuse	6
Mothers of babies discharged from the NNU but who received most of their care in another Unit	4
Maternal psychiatric problem currently under active treatment	2
Mothers of babies going into foster care	1
<b>TOTAL</b>	<b>84</b>

NNU = Neonatal Unit

This table shows the number of neonatal unit mothers excluded from recruitment to the randomised controlled trial by reason for exclusion.

**INFORMATION LETTER TO THE NEONATAL UNIT MOTHERS***Hospital headed note paper***EVALUATION OF MATERNAL SUPPORT INTERVENTIONS FOLLOWING DISCHARGE  
FROM A NEONATAL UNIT: INFORMATION LETTER**

Dear

We understand that your baby's discharge from the Neonatal Unit may be a time of mixed emotions for you. Along with your happiness that your baby no longer needs the special care provided by the Neonatal Unit and the excitement that you will soon be taking your baby home you may well be experiencing a whole range of other feelings. We are very keen to discover more about these feelings and the information and support needs of mothers, such as yourself, during the first twelve weeks at home with your baby. To do this we are undertaking a research project to gather this information and to test two methods of providing parents with additional support. We would be very grateful if you felt able to help us gather this important information but, of course, you are under no obligation to do so. If you decide to take part in this project you will be randomly allocated to one of four groups and all information given by you will be treated as confidential within the research team. If you decided not to participate in this project, please be assured that any future hospital follow-up or treatment required by your baby will not be adversely affected in any way.

Taking part in the project would involve :-

1 being randomly allocated to one of the following groups -

**Group A** -you would receive details of a 24 hour, 7 days a week telephone helpline which is specifically for parents with a baby who has been discharged from the Neonatal Unit. This telephone helpline is run by very experienced neonatal nurses and there is a special telephone number.

In this group you would also receive a booklet which contains a checklist of signs and symptoms which may help you to assess the severity of any illness which your baby may acquire. We will explain this booklet to you in more detail.

**Group B** -you would receive details of a 24 hour, 7 days a week telephone helpline which is specifically for parents with a baby who has been discharged from the Neonatal Unit. This telephone helpline is run by very experienced neonatal nurses and there is a special telephone number.

**Group C** -you would receive a booklet which contains a checklist of signs and symptoms which may help you to assess the severity of any illness which your baby may acquire. We will explain this booklet to you in more detail.

**Group D** -in this group you would **NOT** receive details of **either** the telephone helpline **or** the checklist booklet.

2 filling in a short recruitment questionnaire with a research project nurse.

## Appendix 10 continued

- 3 completing a 'tick box' type questionnaire about how you feel at the present time and how you feel generally. This would be done around the time of discharge from the Neonatal Unit and again after your baby had been at home for 3 months. There are no right or wrong answers to this questionnaire and it should take no more than 5 minutes to complete.
- 4 a second 'tick box' type questionnaire asks you to score words which describe moods and feelings which you may have experienced during the last week. We would like you to fill this in around the time of discharge from the Neonatal Unit and again at monthly intervals for 3 months. Once again, there are no right or wrong answers to this questionnaire and it should take no more than a few minutes to complete on each occasion.
- 5 keeping a daily record for 12 weeks of any health or baby care worries or concerns which you may have. We would like you to tick from a list of people who you actually go to for additional support, information or advice about your baby and how satisfied you were with the information, advice or support you receive. We will provide a book called a 'Health Diary' for you to record this information which should only take you a few minutes each day

If you feel able to help with this research project please sign the form below. You are, of course, free to withdraw from this project at any time without affecting the medical care of your baby.

Yours sincerely

Research Nurse  
Project Nurse  
Project Nurse

On behalf of the research team;

Consultant Neonatologist & Paediatrician  
Senior Lecturer in Public Health Medicine  
Professor of Nursing Studies, University of  
Director of Curriculum, School of Nursing & Midwifery

-----  
Ref. Number.

I \_\_\_\_\_ have read the above information and would like to take part in the research project entitled Evaluation of Maternal Support Interventions Following Discharge From A Neonatal Unit. I understand that I am free to withdraw from this project at any time without affecting the medical care of my baby.

Signature \_\_\_\_\_ Date \_\_\_\_\_

**INFORMATION LETTER TO THE POSTNATAL WARD MOTHERS**

*Hospital headed paper*

**MATERNAL INFORMATION NEEDS FOLLOWING DISCHARGE FROM THE  
POSTNATAL WARD: INFORMATION LETTER**

Dear

We are currently undertaking a research project into parent information and support needs and your name has been randomly selected from the birth register. Parents of newborn babies often experience a mixture of emotions around the time of taking their home from hospital. We are very keen to discover more about these feelings and the information and support needs of mothers, such as yourself, during the first twelve weeks at home with your baby. To do this we are undertaking a research project involving mothers in the Neonatal Unit and on the postnatal wards. We would be very grateful if you felt able to help us gather this important information but, of course, you are under no obligation to do so. If you decide to take part in this project all information given by you will be treated as confidential within the research team. However, if you decided not to participate in this project, please be assured that any future hospital follow-up or treatment required by your baby will not be adversely affected in any way.

Taking part in the project would involve :-

- 1 filling in a short recruitment questionnaire with a research project nurse.
- 2 completing a 'tick box' type questionnaire about how you feel at the present time and how you feel generally. This would be done around the time of discharge from the postnatal ward and again after your baby had been at home for 3 months. There are no right or wrong answers to this questionnaire and it should take no more than 5 minutes to complete.
- 3 a second 'tick box' type questionnaire asks you to score words which describe moods and feelings which you may have experienced during the last week. We would like you to fill this in around the time of discharge from the postnatal ward and again at monthly intervals for 3 months. Once again, there are no right or wrong answers to this questionnaire and it should take no more than a few minutes to complete on each occasion.
- 4 keeping a daily record for 12 weeks of any health or baby care worries or concerns which you may have. We would like you to tick from a list of people who you actually go to for additional support, information or advice about your baby and how satisfied you were with the information, advice or support you receive. We will provide a book called a 'Health Diary' for you to record this information which should only take you a few minutes each day

**Appendix 11 continued**

If you feel able to help with this research project please sign the form below. You are, of course, free to withdraw from this project at any time without affecting the medical care of your baby.

Yours sincerely

Research Nurse  
Project Nurse  
Project Nurse

On behalf of the research team;

Consultant Neonatologist & Paediatrician  
Senior Lecturer in Public Health Medicine  
Professor of Nursing Studies, University of  
Director of Curriculum, School of Nursing & Midwifery

-----

Ref. Number.

I \_\_\_\_\_ have read the above information and would like to take part in the research project Maternal Information Needs Following Discharge From the Postnatal Ward. I understand that I am free to withdraw from this project at any time without affecting the medical care of my baby.

Signature \_\_\_\_\_

Date \_\_\_\_\_

MAIN STUDY QUESTIONNAIRE FOR THE NEONATAL UNIT MOTHERS

## MATERNAL SUPPORT FOLLOWING DISCHARGE FROM A NEONATAL UNIT

**Demographic information***(to be obtained from the case notes and then checked with mother)*

1	Mother's surname:	First name:			
2	Address:				
3	Post code	□ □ □ □ □ □			
4	Telephone number (incl. code) _____				
	home	<input type="checkbox"/>			
	neighbour	<input type="checkbox"/>			
	other	<input type="checkbox"/> <b><i>please specify</i></b> _____			
	public only	<input type="checkbox"/>			
5	Date of birth	□ □ □ □ □ □ (DDMMYY)			
Primary care team		<input type="checkbox"/> GP	<input type="checkbox"/> HV	<input type="checkbox"/> CM	<input type="checkbox"/> PCN

**Obstetric information** *(to be obtained from the case notes and then checked with mother)*

6	Past obstetric history - <b><i>Please tick a box</i></b>			
	investigated or treated infertility	<input type="checkbox"/>	miscarriage	<input type="checkbox"/>
	termination of pregnancy	<input type="checkbox"/>	still birth	<input type="checkbox"/>
	<input type="checkbox"/> sudden infant death syndrome	<input type="checkbox"/>	neonatal death	<input type="checkbox"/>
	other infant or child death	<input type="checkbox"/>	ectopic pregnancy	<input type="checkbox"/>
7	Parity (before this baby)	□ □		
8	Type of delivery- <b><i>Please tick a box</i></b>			
	emergency Caesarean Section under General Anaesthetic	<input type="checkbox"/>		
	'semi'-emergency Caesarean Section under Epidural	<input type="checkbox"/>		
	planned Caesarean Section under General Anaesthetic	<input type="checkbox"/>		
	planned Caesarean Section under Epidural	<input type="checkbox"/>		
	forceps / Ventouse delivery	<input type="checkbox"/>		
	normal vaginal delivery	<input type="checkbox"/>		

**Baby information (to be obtained from the case notes and then checked with mother)**

9 Baby's surname: \_\_\_\_\_ First name: \_\_\_\_\_

10 Baby's date of birth     

11 Gestation at birth (completed weeks)

12 Birth weight          Kg

**Admission & Discharge information**

**(to be obtained from the case notes and then checked with mother)**

13 Date of admission to the Neonatal Unit

14 Time of admission to the Neonatal Unit

15 Diagnosis  
\_\_\_\_\_  
\_\_\_\_\_

16 Date of discharge from the Neonatal Unit

17 Time of discharge from the Neonatal Unit

18 Baby's weight on discharge from the Neonatal Unit     Kg

19 Destination following discharge from the Neonatal Unit-  
 home        
 postnatal ward        
 peripheral maternity unit        
 other (*please specify*)      \_\_\_\_\_

20 Where do you and your baby plan to go following discharge from hospital care?  
 home        
 other       *please specify*) \_\_\_\_\_

21 Date of discharge from hospital care?

**Now we would like to ask some questions about you and your family**

\* please circle correct answer or  a box or boxes

22 Do you smoke cigarettes? **YES / NO \***

23 Did you smoke during your pregnancy? **YES / NO \***

24 Does anyone else living in your household smoke? **YES / NO \***

25 Are you -      married?       separated?   
                     living with partner?       widowed?   
                     single?       divorced?   
                     single living with parents?

26 How many dependent children live in your household?

27 Is your home - owner occupied / owned outright?   
                     owner occupied with mortgage?   
                     rented from Local Authority?   
                     rented from Housing Association?   
                     rented with job or business?   
                     rented privately, unfurnished?   
                     rented privately, furnished?   
                     other **please specify**  \_\_\_\_\_

28 What type of home do you live in?  
                     detached house / bungalow   
                     semi-detached house / bungalow   
                     terraced house   
                     purpose-built flat or maisonette   
                     converted flat or maisonette   
                     within business premises   
                     room / bedsitter   
                     caravan / mobile home / houseboat   
                     other **please specify**  \_\_\_\_\_

29 What is your occupation? \_\_\_\_\_

30 If presently unemployed, what was your last paid occupation?  
                     \_\_\_\_\_

31 Do you have any professional qualifications? **YES / NO\***

32 If YES, please give details \_\_\_\_\_

33 What is your partner's occupation? \_\_\_\_\_

**Questions about you and your family continued**

34 If presently unemployed, what was his last paid occupation?  
 \_\_\_\_\_

35 Does he have any professional qualifications? **YES / NO\***

36 If YES, please give details \_\_\_\_\_

37 When you finished school, or further education, what educational qualifications did you have?  
 No qualifications  Higher education below Degree   
 GCSE Grades A – C  Degree or equivalent   
 GCSE Grades D – G  Vocational training courses   
 O Level  Foreign or other \_\_\_\_\_  
 A Level

**Finally, a few questions about how you feel about your baby's stay in the Neonatal Unit****SCALE =**

**1 = very dissatisfied**  
**2 = slightly dissatisfied**  
**3 = generally satisfied**  
**4 = very satisfied**

38 During your baby's stay in the Neonatal Unit, how satisfied have you felt about the information you received about your baby's –

diagnosis / problem?	1	2	3	4	N/A
investigations?	1	2	3	4	N/A
progress?	1	2	3	4	N/A
medicines?	1	2	3	4	N/A
discharge plans?	1	2	3	4	N/A

39 Please give details of your dissatisfactions.

\_\_\_\_\_

\_\_\_\_\_

40 How satisfied are you that the Neonatal Unit has prepared you for caring for your baby at home? **1 2 3 4 N/A**

41 Please give details of your dissatisfactions.

\_\_\_\_\_

\_\_\_\_\_

42 Have you received your Parent Held Child Health Record book? **YES / NO\***

**FOR OFFICE USE ONLY**

Date of recruitment: \_\_\_\_\_

Date of completion: \_\_\_\_\_

Randomised to group: **please circle** **A B C D**

**MAIN STUDY QUESTIONNAIRE FOR THE POSTNATAL WARD MOTHERS****MATERNAL INFORMATION NEEDS FOLLOWING DISCHARGE FROM THE POSTNATAL WARD*****Demographic information******(to be obtained from the case notes and then checked with mother)***

1	Mother's surname:	First name:
2	Address:	
3	Post code	<input type="text"/>
4	Telephone number (incl. code)	_____
	home	<input type="checkbox"/>
	neighbour	<input type="checkbox"/>
	other	<input type="checkbox"/> <i>please specify</i> _____
	public only	<input type="checkbox"/>
5	Date of birth	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> (DDMMYY)
Primary care team		<input type="checkbox"/> GP <input type="checkbox"/> HV <input type="checkbox"/> CM <input type="checkbox"/> PCN

***Obstetric information (to be obtained from the case notes and then checked with mother)***

6	Past obstetric history - <b><i>Please <input checked="" type="checkbox"/> a box</i></b>			
	investigated or treated infertility	<input type="checkbox"/>	miscarriage	<input type="checkbox"/>
	termination of pregnancy	<input type="checkbox"/>	still birth	<input type="checkbox"/>
	sudden infant death syndrome	<input type="checkbox"/>	neonatal death	<input type="checkbox"/>
	other infant or child death	<input type="checkbox"/>	ectopic pregnancy	<input type="checkbox"/>
7	Parity (before this baby)	<input type="text"/> <input type="text"/>		
8	Type of delivery- <b><i>Please <input checked="" type="checkbox"/> a box</i></b>			
	emergency Caesarean Section under General Anaesthetic	<input type="checkbox"/>		
	'semi'-emergency Caesarean Section under Epidural	<input type="checkbox"/>		
	planned Caesarean Section under General Anaesthetic	<input type="checkbox"/>		
	planned Caesarean Section under Epidural	<input type="checkbox"/>		
	forceps / Ventouse delivery	<input type="checkbox"/>		
	normal vaginal delivery	<input type="checkbox"/>		

**Baby information (to be obtained from the case notes and then checked with mother)**

9 Baby's surname: \_\_\_\_\_ First name: \_\_\_\_\_

10 Baby's date of birth     

11 Gestation at birth (*completed weeks*)

12 Birth weight          Kg

**Admission & Discharge information****(to be obtained from the case notes and then checked with mother)**

13 Date of admission to the postnatal ward

14 Time of admission to the postnatal ward

15 Date of discharge from the postnatal ward

16 Time of discharge from the postnatal ward

17 Baby's weight on discharge          Kg

18 Destination following discharge from the postnatal ward  
 home        
 peripheral maternity unit        
 other (*please specify*)     

19 Where do you and your baby plan to go following discharge from hospital care?  
 Home        
 Other     

20 Date of discharge from hospital care?

**Now we would like to ask some questions about you and your family**

\* Please circle correct answer or  a box or boxes

21	Do you smoke cigarettes?	YES / NO *
22	Did you smoke during your pregnancy?	YES / NO *
23	Does anyone else living in your household smoke?	YES / NO *
24	Are you –	
	married? <input type="checkbox"/>	separated? <input type="checkbox"/>
	living with partner? <input type="checkbox"/>	widowed? <input type="checkbox"/>
	single? <input type="checkbox"/>	divorced? <input type="checkbox"/>
	single living with parents? <input type="checkbox"/>	
25	How many dependent children live in your household?	<input type="checkbox"/> <input type="checkbox"/>
26	Is your home -	
	owner occupied / owned outright? <input type="checkbox"/>	
	owner occupied with mortgage? <input type="checkbox"/>	
	rented from Local Authority? <input type="checkbox"/>	
	rented from Housing Association? <input type="checkbox"/>	
	rented with job or business? <input type="checkbox"/>	
	rented privately, unfurnished? <input type="checkbox"/>	
	rented privately, furnished? <input type="checkbox"/>	
	other <b>please specify</b> _____	
27	What type of home do you live in?	
	detached house / bungalow <input type="checkbox"/>	
	semi-detached house / bungalow <input type="checkbox"/>	
	terraced house <input type="checkbox"/>	
	purpose-built flat or maisonette <input type="checkbox"/>	
	converted flat or maisonette <input type="checkbox"/>	
	within business premises <input type="checkbox"/>	
	room / bedsitter <input type="checkbox"/>	
	caravan / mobile home / houseboat <input type="checkbox"/>	
	other <b>please specify</b> _____	

**Questions about you and your family continued**

28 What is your occupation? \_\_\_\_\_

29 If presently unemployed, what was your last paid occupation?  
\_\_\_\_\_

30 Do you have any professional qualifications? **YES / NO\***

31 If YES, please give details \_\_\_\_\_

32 What is your partner's occupation? \_\_\_\_\_

33 If presently unemployed, what was his last paid occupation?  
\_\_\_\_\_

34 Does he have any professional qualifications? **YES / NO\***

35 If YES, please give details \_\_\_\_\_

36 When you finished school, or further education, what educational qualifications did you have?  
 No qualifications  Higher education below Degree   
 GCSE Grades A - C  Degree or equivalent   
 GCSE Grades D - G  Vocational training courses   
 O Level  Foreign or other \_\_\_\_\_   
 A Level

**Finally, a question about how you feel about your baby's stay in the postnatal ward**    **SCALE =**    **1 = very dissatisfied**

**2 = slightly dissatisfied**

**3 = generally satisfied**

**4 = very satisfied**

37 How satisfied are you that the postnatal ward has prepared you for caring for your baby at home?    1    2    3    4    N/A

38 Please give details of your dissatisfactions.  
\_\_\_\_\_  
\_\_\_\_\_

39 Have you received your Parent Held Child Health Record book? **YES / NO\***

**FOR OFFICE USE ONLY**

Date of recruitment

Date of completion

**SPEILBERGER STATE TRAIT ANXIETY INVENTORY**

**MIND GARDEN**  
Palo Alto, California

**SELF-EVALUATION QUESTIONNAIRE****STAI Form Y-1****Please provide the following information:**

Name \_\_\_\_\_ Date \_\_\_\_\_ S \_\_\_\_\_

Age \_\_\_\_\_ Gender (Circle) M F T \_\_\_\_\_

**DIRECTIONS:**

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate value to the right of the statement to indicate how you feel *right now*, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

1. I feel calm .....	1	2	3	4
2. I feel secure .....	1	2	3	4
3. I am tense .....	1	2	3	4
4. I feel strained .....	1	2	3	4
5. I feel at ease .....	1	2	3	4

NOT AT ALL  
SOMEWHAT  
MODERATELY SO  
VERY MUCH SO

**State-Trait Anxiety Inventory<sup>©</sup> 1968,1977****Author: Charles D. Spielberger****Mind Garden, Redwood City, CA 94061****Reproduced by permission of the publisher. All rights reserved.**

PROFILE OF MOOD STATES - BI POLAR FORM

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<p>Below are words that describe feelings and moods people have. Please read EVERY word carefully. Then fill in ONE space under the answer which best describes how you have been feeling DURING THE PAST WEEK INCLUDING TODAY.</p> <p>Suppose the word is <i>happy</i>. Mark the one answer which is closest to how you have been feeling DURING THE PAST WEEK INCLUDING TODAY.</p>																																																																																																																
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**Profile of Mood States Bi-Polar Form<sup>©</sup> 1980**  
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**CHARACTERISTICS OF MOTHERS AND BABIES IN THE SPIELBERGER STATE-Trait Anxiety Inventory Analysis Groups**

**MOTHERS AND BABIES INCLUDED IN THE ANALYSIS OF ANXIETY**

The characteristics of the 47 matched neonatal unit (MNNU) mothers and 35 postnatal ward (PNW) mothers in the comparison study and the 194 neonatal unit (NNU) mothers in the randomised controlled trial (RCT) who completed the Spielberger State-Trait Anxiety Inventory (STAI) at all the time points are described. For ease of presentation the baby characteristics are presented first following by the characteristics of the mothers.

**Characteristics of babies**

Table A shows the characteristics of babies born to mothers who completed the STAI assessments for trait-anxiety, and state-anxiety around the time of discharge home and at three months after discharge.

**Key to table A (over the page)**

NNU	= neonatal unit mother
PNW	= postnatal ward mother
MNNU	= NNU mother matched with PNW mother by maternal age and mothering experience
Group A	= 'Baby Helpline' and 'Baby Check'
Group B	= 'Baby Helpline'
Group C	= 'Baby Check'
Group D	= No intervention
<sup>a</sup>	= <i>p</i> -value derived from analysis of variance of continuous variable
n/a	= not applicable

Table A Characteristics of babies (n=229) (Key for table A on previous page)

Characteristics	Total NNU Group n=194 (%)	NNU Group A n = 52 (%)	NNU Group B n = 45 (%)	NNU Group C n = 50 (%)	NNU Group D also MNNU n= 47 (%)	PNW Group n=35 (%)	Difference between groups	
							Groups A - D p-value	MNNU - PNW p-value
<b>Birth weight (BW) Kg - mean (sd)</b>	2.609 (1.003)	2.584 (1.113)	2.569 (0.894)	2.602 (0.995)	2.683 (1.011)	3.491 (0.382)	0.95 <sup>a</sup>	<0.001 <sup>a</sup>
<b>Gestation - weeks</b>							0.68	<0.001
24 - 29	14 (7)	6 (12)	3 (7)	3 (6)	2 (4)	0		
30 - 33	42 (22)	12 (23)	9 (20)	11 (22)	10 (21)	0		
34 - 37	64 (33)	12 (23)	21 (47)	15 (30)	16 (34)	2 (6)		
38 - 39	33 (17)	11 (21)	4 (9)	9 (18)	9 (19)	9 (26)		
40 +	41 (21)	11 (21)	8 (18)	12 (24)	10 (21)	24 (69)		
<b>Equal or less than 32 weeks gestation &amp;or BW 1.5Kg -No -Yes</b>	151 (78) 43 (22)	39 (75) 13 (25)	36 (80) 9 (20)	38 (76) 12 (24)	38 (80) 9 (19)	n/a	0.87	
<b>Length of stay-days</b>							0.33	
0 - 1	36 (19)	12 (23)	6 (13)	10 (20)	8 (17)	n/a		
2 - 7	61 (31)	11 (21)	17 (38)	17 (34)	16 (34)	n/a		
8 - 14	25 (13)	7 (13)	6 (13)	7 (14)	5 (11)	n/a		
15 - 28	31 (16)	11 (21)	7 (16)	3 (6)	10 (21)	n/a		
29 - 56	24 (12)	3 (6)	6 (13)	10 (20)	5 (11)	n/a		
57 +	17 (9)	8 (15)	3 (7)	3 (6)	3 (6)	n/a		
<b>Discharge weight Kg – mean (sd)</b>	2.873 (0.775)	3.000 (0.820)	2.721 (0.689)	2.865 (0.779)	2.888 (0.796)	n/a	0.37	

Table A shows the characteristics of the babies born to mothers who completed the STAI assessments at all time points:-

**Birth weight**

**Comparison study**

There was a significant difference in birth weight between the MNNU mothers and the PNW mothers ( $p<0.001$ ). The mean birth weights were 2.683 (sd 1.011Kg) for the MNNU group and 3.491 (sd 0.382Kg) for the PNW group.

**Randomised controlled trial**

The mean birth weight was 2.609Kg (sd 1.003Kg) with no significant differences across the four trial arm groups ( $p=0.95$ ).

**Gestation at birth**

**Comparison study**

The MNNU mothers gave birth to their baby at a significantly younger gestation than the PNW mothers ( $p<0.001$ ). Sixty per cent of the MNNU mothers gave birth prematurely compared with 6% of the PNW mothers and 40% of the MNNU mothers delivered at or after term compared with 94% of the PNW mothers.

**Randomised controlled trial**

There was no significant difference in the gestation at birth of the babies across the four trial arm groups ( $p=0.68$ ). Premature birth accounted for 120 babies (62%).

**Birth at 32 or less weeks gestation and/or 1.5Kg or less birth weight**

**Comparison study**

This category was not applicable to babies born to the PNW mothers.

**Randomised controlled trial**

There was no significant difference between the trial arm groups for babies born at 32 or less weeks gestation and/or 1.5Kg or less birth weight ( $p=0.87$ ).

**Length of stay**

**Comparison study**

This category was not applicable to babies born to the PNW mothers.

***Randomised controlled trial***

There was no significant difference in the length of stay on the Neonatal Unit across the four trial arm groups ( $p=0.33$ ). The median length of stay was 7.5 days (IQR 2 – 25 days). Thirty-six babies (19%) were admitted for only one day and forty-one babies (21%) remained for one month or more following birth.

**Discharge weight**

***Comparison study***

This category was not applicable to babies born to the PNW mothers.

***Randomised controlled trial***

The mean discharge weight was 2.873Kg (sd 0.775Kg). There was no significant difference in the discharge weight of babies across the four trial arm groups ( $p=0.37$ ).

Having looked at the characteristics of the babies we will now consider the characteristics of mothers who completed the STAI questionnaires.

**Characteristics of the mothers**

Table B shows the characteristics of mothers who completed the STAI assessments for trait-anxiety, and state-anxiety around the time of their baby's discharge home and at three months after discharge. We will recall that the mothers in the comparison study were matched by maternal age and mothering experience only and the neonatal unit mothers in the four trial arm groups of the randomised controlled trial were not matched for any characteristic.

**Table B Characteristics of mothers (n=229)**

(Key to table B over page)

Characteristics	Total NNU Group n=194 (%)	NNU Group A n = 52 (%)	NNU Group B n = 45 (%)	NNU Group C n = 50 (%)	NNU Group D also MNNU n = 47 (%)	NNU Group n= 35 (%)	PNW Group	Difference between groups	
								Groups A - D p-value	MNNU - PNW p-value
<b>Maternal age years - mean (sd)</b>	29.07 (5.18)	29.45 (5.41)	29.20 (5.74)	28.99 (4.44)	28.60 (5.23)	29.83 (5.26)		0.88 <sup>a</sup>	0.30 <sup>a</sup>
<b>Qualifications</b>								0.10	0.06
None	11 (6)	5 (10)	2 (4)	1 (2)	3 (6)	3 (6)			
GCSE/O Level	86 (44)	21 (40)	22 (49)	21 (42)	22 (47)	11 (31)			
A Level	21 (11)	6 (12)	5 (11)	8 (16)	2 (4)	5 (14)			
Higher Ed/degree	26 (13)	4 (8)	10 (22)	5 (10)	7 (15)	11 (31)			
Vocational	19 (10)	4 (8)	1 (2)	5 (10)	9 (19)	1 (3)			
Other	31 (16)	12 (23)	5 (11)	10 (20)	4 (9)	4 (11)			
<b>Marital status</b>								0.34 <sup>b</sup>	0.19 <sup>b</sup>
Married/lived with partner	175 (90)	48 (92)	43 (96)	44 (88)	40 (85)	33 (94)			
Single	12 (6)	4 (8)	2 (4)	3 (6)	3 (6)	1 (3)			
Single lived with parents	5 (3)	0	0	2 (4)	3 (6)	1 (3)			
Other	2 (1)	0	0	1 (2)	1 (2)	0			
<b>Adverse obstetric history</b>									
-No event	111 (57)	30 (58)	26 (58)	31 (62)	24 (51)	23 (66)			
-Any event	83 (43)	22 (42)	19 (42)	19 (38)	23 (49)	12 (34)			
<b>Experienced mother -No -Yes</b>	110 (57) 84 (43)	31 (60) 21 (40)	25 (56) 20 (44)	29 (58) 21 (42)	25 (53) 22 (47)	21 (60) 14 (40)			
<b>Delivery type</b>								0.49	0.09
C. section - general	41 (21)	5 (10)	9 (20)	15 (30)	12 (26)	2 (6)			
C. section - epidural	60 (31)	17 (33)	15 (33)	14 (28)	14 (30)	10 (29)			
Forceps / Ventouse	17 (9)	7 (13)	3 (7)	3 (6)	4 (9)	6 (17)			
Normal vaginal	76 (39)	23 (44)	18 (40)	18 (36)	17 (36)	17 (49)			

**Table B** Characteristics of mothers (n=229) continued

Characteristics	Total NNU Group	NNU Group A	NNU Group B	NNU Group C	NNU Group D also MNNU n=47 (%)	NNU Group n=50 (%)	NNU Group D also MNNU n=47 (%)	NNU Group n=35 (%)	PNW Group	Difference between groups	
	n=194 (%)	n=52 (%)	n=45 (%)	n=50 (%)	n=47 (%)	n=45 (%)	n=47 (%)	n=35 (%)	PNW Group	Groups A - D p-value	MNNU - PNW p-value
<b>Exposure to smoke</b>											
Cigarette smoker	47 (24)	11 (21)	11 (24)	11 (22)	14 (30)	5 (14)	0.75	0.10			
Smoked in pregnancy	42 (22)	12 (23)	10 (22)	10 (20)	10 (21)	5 (14)	0.98	0.42			
Other household smokers	68 (35)	18 (35)	12 (27)	21 (42)	17 (36)	12 (34)	0.48	0.86			
<b>Home tenure</b>											
Home owner	130 (67)	35 (67)	29 (64)	35 (70)	31 (66)	29 (83)	0.94	0.36			
Rent-Local Authority/H. A.	35 (18)	9 (17)	9 (20)	7 (14)	10 (21)	4 (11)					
Rent-private/employment	27 (14)	7 (13)	7 (16)	8 (16)	5 (11)	2 (6)					
Other	2 (1)	1 (2)	0	0	1 (2)	0					
<b>Access to telephone</b>											
Telephone in own home	188 (97)	51 (98)	44 (98)	48 (96)	45 (96)	32 (91)	0.87	0.65 <sup>c</sup>			

**Key to table B**

NNU = neonatal unit mother  
 PNW = postnatal ward mother  
 MNNU = NNU mother matched with PNW mother by maternal age and mothering experience  
 Group A = 'Baby Helpline' and 'Baby Check'  
 Group B = 'Baby Helpline'  
 Group C = 'Baby Check'  
 Group D = 'No intervention'  
<sup>a</sup> =  $p$ -value derived from analysis of variance of continuous variable  
<sup>b</sup> =  $p$ -value derived from married/living with partner versus other groups combined  
<sup>c</sup> =  $p$ -value derived from Fisher's Exact test  
 general = general anaesthetic  
 epidural = epidural anaesthetic

Table B shows the number of mothers in each trial arm group remained approximately even and the characteristics of mothers who completed the STAI assessments were:-

**Maternal age**

***Comparison study***

These mothers were matched by maternal age therefore there was no significant difference in the mean age of the MNNU mothers and the PNW mothers ( $p=0.30$ ).

***Randomised controlled trial***

There was no significant difference in age of the mothers across the four trial arm groups ( $p=0.88$ ), the mean maternal age was 29.07 years (sd 5.18).

**Qualifications**

***Comparison study***

There was no significant difference between the MNNU mothers and the PNW mothers for educational attainment on leaving full time education ( $p=0.06$ ). Three mothers in each group had no qualifications, 47% of MNNU and 31% of PNW mothers achieved GCSE/O-Levels, 4% of MNNU and 14% of PNW mothers gained A-Levels and 15% of MNNU and 31% of PNW mothers completed their full time education with a higher education diploma or degree. The remainder of mothers in both groups (28% MNNU and 14% PNW) obtained vocational or other qualifications.

***Randomised controlled trial***

There was no significant difference across the four trial arm groups for educational attainment on leaving full time education ( $p=0.93$ ). Overall, only 6% of the NNU mothers completed full time education with no qualifications, 44% achieved GCSE/O-Levels, 11% A-Levels and 13% completed their education with a higher education diploma or degree and the remaining 26% of the mothers had vocational or other qualifications.

**Marital status**

***Comparison study***

There was no significant difference between the MNNU mothers and the PNW mothers for marital status ( $p=0.19$ ). The majority of MNNU mothers (85%) and PNW mothers (94%) were married or lived with their partner. The other mothers in both groups were single, widowed, divorced or single living with their parents.

### ***Randomised controlled trial***

There was no significant difference between those who were married or lived with their partner and the other women combined across the four trial arm groups ( $p=0.34$ ). The majority (90%) of mothers were married or lived with their partner, 7% (14) were single, separated or divorced and another 3% (5) were single but lived with their parents.

### **Adverse obstetric history**

#### ***Comparison study***

There was no significant difference between the MNNU mothers and the PNW mothers for previous adverse obstetric history combined ( $p=0.19$ ). However, the table below shows the individual events experienced by mothers in the comparison study.

#### **Previous adverse obstetric events in the matched neonatal unit mothers and the postnatal ward mothers (n=82)**

Previous obstetric event	MNNU mothers n=47		PNW mothers n=35		Difference between groups p-value
<b>Infertility</b>	6	13%	4	11%	<b>1.00<sup>a</sup></b>
<b>Miscarriage</b>	14	30%	9	26%	<b>0.69</b>
<b>Ectopic pregnancy</b>	1	2%	0	0	<b>1.00<sup>a</sup></b>
<b>Termination of pregnancy</b>	8	17%	1	3%	<b>0.07<sup>a</sup></b>
<b>Still birth</b>	2	4%	0	0	<b>0.51<sup>a</sup></b>
<b>Neonatal death</b>	2	4%	0	0	<b>0.51<sup>a</sup></b>
<b>Other baby deaths</b>	1	2%	0	0	<b>1.00<sup>a</sup></b>

<sup>a</sup> = Fisher's Exact test

The table shows that approximately similar proportions of women in both groups experienced investigations or treatment for infertility. Previous miscarriage was a common event for both MNNU (30%) and PNW (26%) mothers. Contrary to the total groups of MNNU and PNW mothers, although more MNNU mothers than PNW mothers had a previous termination of pregnancy the difference was not significant ( $p=0.07$ ). The experience of previous baby deaths was exclusive to MNNU mothers.

### ***Randomised controlled trial***

There was no significant difference between the four trial arm groups for adverse obstetric history combined ( $p=0.75$ ). Overall, 11% of NNU mothers had undergone investigations or treatment for infertility, 11% had terminated a pregnancy, 25% had previously had a miscarriage or ectopic pregnancy and 7% of mothers had experienced a stillbirth, neonatal or other baby death. The association demonstrated in the total sample of NNU

mothers between previous termination and this pregnancy resulting in the birth of a low birth weight or premature baby was not seen in this sub-group of mothers.

### **Mothering experience**

#### ***Comparison study***

These mothers were matched for mothering experience therefore there was no significant difference between the MNNU mothers and the PNW mothers ( $p=0.54$ ). For 53% of the MNNU and 60% of the PNW mothers, this was their first mothering experience.

#### ***Randomised controlled trial***

There was no significant difference in mothering experience across the four trial arm groups ( $p=0.93$ ). For 57% of the NNU mothers this was their first mothering experience.

### **Delivery type**

#### ***Comparison study***

There was no significant difference in the type of delivery between the MNNU mothers and the PNW mothers ( $p=0.09$ ). Fifty-five per cent (26) of MNNU mothers delivered their baby by Caesarean section, 12 under general anaesthetic and 14 under epidural anaesthetic compared with 34% (12) of PNW mothers, with 2 delivering under general anaesthetic and 10 under epidural anaesthetic. Nine per cent (4) of MNNU mothers and 17% (6) of PNW mothers had forceps/Ventouse deliveries and 36% (17) MNNU and 49% (17) PNW mothers had normal vaginal deliveries.

#### ***Randomised controlled trial***

There was no significant difference in the type of delivery across the four trial arm groups ( $p=0.49$ ). The majority (52%) of mothers delivered by Caesarean section, 41 under general anaesthetic and 60 under epidural anaesthetic, 9% had forceps/Ventouse deliveries and 39% had normal vaginal deliveries.

### **Smoking**

#### ***Comparison study***

There was no significant difference between the MNNU mothers and the PNW mothers for smoking habits. Thirty per cent (14) of MNNU and 14% (5) of PNW mothers described themselves as cigarette smokers ( $p=0.10$ ). The number who continued to smoke during this pregnancy remained the same for the PNW mothers but decreased to 21% (10) of MNNU mothers ( $p=0.42$ ). Exposure to cigarette smoke increased in both groups (36% of

MNNU mothers and 34% of PNW mothers) when other household smokers were considered ( $p=0.86$ ).

***Randomised controlled trial***

Twenty-four per cent (n=47) of mothers described themselves as cigarette smokers. The incidence of smoking reduced slightly to 22% (n=42) in those who reported smoking during this last pregnancy. Thirty-five per cent (n=68) reported that, regardless of their smoking habit, at least one other household member smoked. There were no significant differences between the four trial arm groups for maternal smoking ( $p=0.75$ ), smoking during pregnancy ( $p=0.98$ ) or other household smokers ( $p=0.48$ ).

**Home tenure**

***Comparison study***

Overall, there was no significant difference in home tenure between the MNNU mothers and the PNW mothers ( $p=0.36$ ). The majority of mothers (66% of the MNNU and 83% of the PNW mothers) owned their own home, with or without a mortgage. Twenty-one per cent of the MNNU mothers compared with 11% of the PNW mothers rented their home from the local authority or a housing association. Eleven per cent of MNNU and 6% of the PNW mothers rented their home as furnished or unfurnished accommodation from a private landlord or as an integral part of their employment. One MNNU mother had an alternative style of home tenure.

***Randomised controlled trial***

There was no significant difference across the four trial arm groups for home tenure ( $p=0.94$ ). In terms of home tenure, 130 (67%) owned their own home with or without a mortgage. Thirty-five (18%) mothers rented their home from the local authority or a housing association whilst another 27 (14%) rented their home as furnished or unfurnished accommodation from a private landlord or as an integral part of their employment. Two mothers (1%) had other styles of home tenure.

**Telephone access**

***Comparison study***

There was no significant difference between the MNNU mothers (96%) and the PNW mothers (91%) for domestic access to a telephone ( $p=0.65$ ).

***Randomised controlled trial***

The majority of mothers (97%) had access to a telephone within their own home. There was no significant difference between the four trial arm groups for domestic access to a telephone ( $p=0.87$ ).

Therefore we have seen demonstrated that the matched neonatal unit mothers and the postnatal ward mothers who completed the STAI assessments at all the time points for the comparison study were representative of the total group of mothers within the comparison study.

We have also seen that there were no significant differences between the four trial arm groups for any characteristic of the neonatal unit mothers or their babies. This sub-set of mothers who completed the STAI assessments at all the time points were therefore representative of the total group of neonatal unit mothers. Any significant differences in anxiety between the intervention groups could therefore reasonably be attributed to the effect of the 'Baby Helpline' and/or the 'Baby Check' interventions.

**CORRELATION OF TRAIT AND STATE-ANXIETY**

The strength of the relationship between trait-anxiety and state-anxiety at two time points are shown in table A for the matched neonatal unit mothers and table B for the postnatal ward mothers in the comparison study (part 2) and table C for the neonatal unit mothers in the randomised control trial.

**Table A Correlation between trait and state-anxiety scores for the matched neonatal unit mothers (n=47)**

	Trait-anxiety	First state-anxiety	Second state-anxiety
<b>Trait-anxiety</b>	1.000	0.657 ( $p<0.001$ )	0.503 ( $p<0.001$ )
<b>First state-anxiety</b>	0.657 ( $p<0.001$ )	1.000	0.376 ( $p=0.009$ )
<b>Second state-anxiety</b>	0.503 ( $p<0.001$ )	0.376 ( $p=0.009$ )	1.000

**Table B Correlation between trait and state-anxiety scores for the postnatal ward mothers (n=35)**

	Trait-anxiety	First state-anxiety	Second state-anxiety
<b>Trait-anxiety</b>	1.000	0.692 ( $p<0.001$ )	0.463 ( $p<0.005$ )
<b>First state-anxiety</b>	0.692 ( $p<0.001$ )	1.000	0.480 ( $p=0.004$ )
<b>Second state-anxiety</b>	0.463 ( $p=0.005$ )	0.480 ( $p=0.004$ )	1.000

**Table C Correlation between trait and state-anxiety scores for the neonatal unit mothers (n=194)**

	Trait-anxiety	First state-anxiety	Second state-anxiety
<b>Trait-anxiety</b>	1.000	0.572 ( $p<0.001$ )	0.383 ( $p<0.001$ )
<b>First state-anxiety</b>	0.572 ( $p<0.001$ )	1.000	0.337 ( $p<0.001$ )
<b>Second state-anxiety</b>	0.383 ( $p<0.001$ )	0.337 ( $p<0.001$ )	1.000

Tables A, B and C show high correlation (Pearson correlation) between trait-anxiety and state-anxiety scores at the time of discharge home (first state-anxiety) and at three months following discharge (second state-anxiety). There was also a strong correlation between first and second state-anxiety scores. However, the correlation between trait-anxiety and the first state-anxiety scores was stronger than the correlation between trait-anxiety and the second state-anxiety or the correlation between the first and second state-anxiety scores. This indicated therefore that mothers with, for example a higher trait-anxiety score were likely to show a higher state-anxiety score at both time points but particularly at the first state-anxiety score. Similarly, mothers who showed, for example a lower first state-anxiety score also showed a lower second state-anxiety score. The positive correlation described confirms the strength of the relationship between trait and state-anxiety, and state-anxiety at two time points.

**CHARACTERISTICS OF MOTHERS AND BABIES**  
**IN THE PROFILE OF MOOD STATES BI-POLAR FORM**  
**ANALYSIS GROUPS**

**MOTHERS AND BABIES INCLUDED IN THE ANALYSIS OF MOOD**

The mothers who completed the Profile of Mood States Bi-Polar Form (POMS-Bi) at all the time points are described in relation to their characteristics and the characteristics of their baby. For the comparison study (part 2), 28 matched neonatal unit (MNNU) mothers and 22 postnatal ward (PNW) mothers and for the randomised controlled trial the 110 neonatal unit (NNU) mothers who completed the POMS-Bi assessments. For ease of presentation the baby characteristics are presented first followed by the characteristics of the mothers.

**Characteristics of babies**

Table A shows the characteristics of babies born to mothers who completed the POMS-Bi assessments around the time of their baby's discharge home and at one, two and three months after discharge.

**Key to table A**

NNU	= neonatal unit mother
PNW	= postnatal ward mother
MNNU	= NNU mother matched with PNW mother by maternal age and mothering experience
Group A	= 'Baby Helpline' and 'Baby Check'
Group B	= 'Baby Helpline'
Group C	= 'Baby Check'
Group D	= 'No intervention'
<sup>a</sup>	= <i>p</i> -value derived from analysis of variance of continuous variable
n/a	= not applicable

Table A Characteristics of babies (n=132) (key on previous page)

Characteristics	Total NNU Group n=110 (%)	NNU Group A n = 32 (%)	NNU Group B n = 26 (%)	NNU Group C n = 24 (%)	NNU Group D also MNNU n= 28 (%)	NNU Group n=22 (%)	PNW Group n=22 (%)	Difference between groups	
								Groups A - D p-value	MNNU - PNW p-value
Birth weight (BW) Kg - mean (sd)	2.602 (1.045)	2.649 (1.176)	2.614 (0.980)	2.461 (0.984)	2.658 (1.042)	3.542 (0.425)	0.90 <sup>a</sup>	<0.001 <sup>a</sup>	
Gestation - weeks							0.64		<0.001
24 - 29	9 (8)	3 (9)	3 (12)	1 (4)	2 (7)	0			
30 - 33	28 (25)	8 (25)	5 (19)	8 (33)	7 (25)	0			
34 - 37	34 (31)	8 (25)	10 (38)	5 (21)	11 (39)	1 (5)			
38 - 39	17 (15)	5 (16)	2 (8)	7 (29)	3 (11)	6 (27)			
40 +	22 (20)	8 (25)	6 (23)	3 (13)	5 (18)	15 (68)			
Birth at 32 or less weeks gestation &/or BW 1.5K or less g -No -Yes	81 (74) 29 (26)	23 (72) 9 (28)	20 (77) 6 (23)	17 (71) 7 (29)	21 (75) 7 (25)	n/a	0.96		
Length of stay-days							0.51		
0 - 1	23 (21)	7 (22)	4 (15)	6 (25)	6 (21)	n/a			
2 - 7	28 (25)	6 (19)	10 (38)	6 (25)	6 (21)	n/a			
8 - 14	13 (12)	5 (16)	3 (12)	2 (8)	3 (11)	n/a			
15 - 28	21 (19)	7 (22)	3 (12)	3 (13)	8 (29)	n/a			
29 - 56	16 (15)	3 (9)	3 (12)	7 (29)	3 (11)	n/a			
57 +	9 (8)	4 (13)	3 (12)	0	2 (7)	n/a			
Discharge weight Kg - mean (sd)	2.890 (0.781)	3.065 (0.883)	2.853 (0.656)	2.670 (0.761)	2.913 (0.771)	n/a	0.31 <sup>a</sup>		

Table A shows the characteristics of the babies born to mothers who completed the POMS-Bi assessments at all time points:-

**Birth weight**

**Comparison study**

There was a significant difference in the birth weight between the babies born to the MNNU mothers and the PNW mothers ( $p<0.001$ ). The mean birth weights were 2.658 Kg (sd 1.042kg) for the MNNU group and 3.542Kg (0.425Kg) for the PNW group.

**Randomised controlled trial**

The mean birth weight for the babies born to the NNU mothers was 2.602Kg (sd 1.045Kg) with no significant difference across the four trial arm groups ( $p=0.90$ ).

**Gestation at birth**

**Comparison study**

The MNNU mothers delivered their babies at a significantly earlier gestation than the PNW mothers ( $p<0.001$ ). Premature birth accounted for 71% of the MNNU mothers compared with just 5% of the PNW mothers and 29% of the MNNU mothers delivered at or after term compared with 95% of the PNW mothers.

**Randomised controlled trial**

There was no significant difference in the gestation at birth of the babies in the four trial arm groups ( $p=0.64$ ). Premature birth accounted for 71 (65%) babies.

**Birth at 32 or less weeks gestation and/or 1.5Kg or less birth weight**

**Comparison study**

This category was not applicable to babies born to the PNW mothers.

**Randomised controlled trial**

There was no significant difference across the four trial arm groups for babies born at 32 or less weeks of gestation and/or 1.5Kg or less birth weight ( $p=0.96$ ).

**Length of stay**

**Comparison study**

This category was not applicable to babies born to the PNW mothers.

***Randomised controlled trial***

There was no significant difference in the length of stay across the four trial arm groups ( $p=0.51$ ). The median length of stay on the Neonatal Unit was 10.5 days (IQR 2.00 - 26.50 days). Fifty-one babies (46%) stayed for seven days or less and 25 (23%) remained on the Neonatal Unit for one month or more following birth.

**Discharge weight**

***Comparison study***

This category was not applicable to babies born to the PNW mothers.

***Randomised controlled trial***

There was no significant difference across the four trial arm groups ( $p=0.31$ ). The mean discharge weight was 2.890Kg (sd 0.781Kg).

Having looked at the baby characteristics we will now consider the characteristics of mothers who completed the POMS-Bi assessments.

**Characteristics of mothers**

Table B shows the characteristics of mothers who completed the POMS-Bi assessments around the time of their baby's discharge home and at one, two and three months after discharge. We will recall that the mothers in the comparison study were matched by maternal age and mothering experience only and the neonatal unit mothers in the four trial arm groups of the randomised controlled trial were not matched for any characteristic.

**Table B Characteristics of mothers (n=132)**

(Key to table B over page)

Characteristics	Total NNU Group n=110 (%)	NNU Group A n = 32 (%)	NNU Group B n = 26 (%)	NNU Group C n = 24 (%)	NNU Group D also MNNU n= 28 (%)	PNW Group n= 22 (%)	Difference between groups	
							Groups A - D p-value	MNNU - PNW p-value
<b>Maternal age years - mean (sd)</b>	29.26 (5.04)	30.19 (5.56)	29.04 (5.17)	29.42 (4.67)	28.28 (4.63)	29.12 (5.90)	0.53 <sup>a</sup>	0.58 <sup>a</sup>
<b>Qualifications</b>							<b>0.04</b>	<b>0.25</b>
None	8 (7)	3 (9)	2 (8)	1 (4)	2 (7)	3 (17)		
GCSE/O Level	49 (45)	12 (38)	15 (58)	9 (38)	13 (46)	8 (36)		
A Level	13 (12)	4 (13)	2 (8)	6 (25)	1 (4)	4 (18)		
Higher Ed/degree	17 (15)	3 (9)	5 (19)	5 (21)	4 (14)	5 (23)		
Vocational	9 (8)	1 (3)	1 (4)	1 (4)	6 (21)	1 (5)		
Other	14 (13)	9 (28)	1 (4)	2 (8)	2 (7)	1 (5)		
<b>Marital status</b>							<b>0.81<sup>b</sup></b>	<b>1.00<sup>bc</sup></b>
Married/lived with partner	103 (94)	29 (91)	25 (96)	23 (96)	26 (93)	21 (95)		
Single	6 (5)	3 (9)	1 (4)	1 (4)	1 (4)	1 (5)		
Single lived with Parents	1 (1)	0	0	0	1 (4)	0		
Other	0	0	0	0	0	0		
<b>Adverse obstetric history</b>								
-No event	67 (61)	20 (63)	15 (58)	16 (67)	16 (57)	15 (68)		
-Any event	43 (39)	12 (38)	11 (42)	8 (33)	12 (43)	7 (32)		
<b>Experienced mother</b>	<b>-No</b>	<b>64 (58)</b>	<b>19 (59)</b>	<b>16 (62)</b>	<b>15 (63)</b>	<b>14 (50)</b>	<b>13 (59)</b>	<b>0.78</b>
<b>-Yes</b>	<b>46 (42)</b>	<b>13 (41)</b>	<b>10 (38)</b>	<b>9 (38)</b>	<b>14 (50)</b>	<b>9 (41)</b>	<b>0.42</b>	<b>0.30</b>
<b>Delivery type</b>								
C. section - general	22 (20)	3 (9)	4 (15)	9 (38)	6 (21)	1 (5)		
C. section - epidural	40 (36)	13 (41)	9 (35)	9 (38)	9 (32)	6 (27)		
Forceps / Ventouse	13 (12)	5 (16)	3 (12)	1 (4)	4 (14)	4 (18)		
Normal vaginal	35 (32)	11 (34)	10 (38)	5 (21)	9 (32)	11 (50)		

continued over page

**Table B** Characteristics of mothers (n=132) continued

Characteristics	Total NNU Group	NNU Group A	NNU Group B	NNU Group C	NNU Group D also MNNU n=28 (%)	NNU Group	PNW Group	Difference between groups	
	n=110 (%)	n=32 (%)	n=26 (%)	n=24 (%)	n=28 (%)	n=22 (%)	n=22 (%)	Groups A – D p-value	MNNU – PNW p-value
<b>Exposure to smoke</b>									
Cigarette smoker	21 (19)	5 (16)	6 (23)	3 (13)	7 (25)	4 (18)	0.61	0.73 <sup>c</sup>	
Smoked in pregnancy	23 (21)	8 (25)	7 (27)	3 (13)	5 (18)	4 (18)	0.56	1.00 <sup>c</sup>	
Other household smokers	36 (33)	9 (28)	7 (27)	9 (38)	11 (39)	8 (36)	0.68	0.83	
<b>Home tenure</b>									
Home owner	80 (73)	21 (66)	17 (65)	19 (79)	23 (82)	17 (77)			
Rent-Local Authority/H. A.	15 (14)	6 (19)	5 (19)	1 (4)	3 (11)	3 (14)			
Rent-private/employment	14 (13)	5 (17)	4 (15)	4 (17)	1 (4)	2 (9)			
Other	1(<1)	0	0	0	1 (4)	0			
<b>Access to telephone</b>									
Telephone in own home	106 (96)	31 (97)	25 (96)	23 (96)	27 (96)	19 (86)	0.99	0.31 <sup>c</sup>	

**Key to table B**

NNU = neonatal unit mother

PNW = postnatal ward mother

MNNU = MNNU mother matched with PNW mother by maternal age and mothering experience

Group A = Baby Helpline and Baby Check

Group B = Baby Helpline

Group C = Baby Check

Group D = No intervention

<sup>a</sup> = p-value derived from analysis of variance from continuous variable<sup>b</sup> = p-value derived from married/living with partner versus other groups combined<sup>c</sup>

= p-value derived from Fisher's Exact test

## Appendix 18 continued

Table B shows the characteristics of mothers who completed the POMS-Bi at all four time points:-

### **Maternal age**

#### ***Comparison study***

The PNW mothers were matched by age with the MNNU mothers therefore there was no significant difference in the mean age of mothers in the MNNU and PNW groups ( $p=0.58$ ).

#### ***Randomised controlled trial***

There was no significant difference between the four trial arm groups of NNU mothers for age. The mean maternal age was 29.28 years (sd 5.04 years).

### **Qualifications**

#### ***Comparison study***

There was no significant difference between the MNNU mothers and the PNW mothers for educational attainment on completion of full time education ( $p=0.25$ ). Two MNNU mothers and three PNW mothers had no qualifications, 46% of MNNU and 36% of PNW mothers achieved GCSE/O-Levels, 4% of MNNU and 18% of PNW mothers gained A-Levels and 14% of MNNU and 23% of PNW mothers completed their full time education with a higher educational diploma or degree. The remainder in both groups (29% MNNU and 9% PNW) obtained vocational or other qualifications.

#### ***Randomised controlled trial***

There was a difference across the four trial arm groups of NNU mothers for educational attainment on leaving full time education ( $p=0.04$ ). However, the difference was probably accounted for by the high numbers in the 'vocational' and 'other' categories. Overall, only 7% of mothers completed full time education with no qualifications, 45% achieved GCSE/O-Levels, 12% gained A-Levels and 15% completed their education with a higher education diploma or degree. The remaining 21% had 'vocational' or 'other' qualifications.

### **Marital status**

#### ***Comparison study***

There was no significant difference between the MNNU mothers and the PNW mothers for marital status ( $p=1.00$ ). The majority of mothers, 93% of the MNNU and 95% of the PNW mothers, were married or lived with their partner. One mother in both groups was single and one MNNU mother lived with her parents.

***Randomised controlled trial***

There was no significant difference between the NNU mothers who were married or lived with their partner and the other mothers combined ( $p=0.81$ ). The majority of mothers (94%) were married or lived with their partner, 6 (5%) mothers were single and one (1%) was single but lived with her parents.

**Adverse obstetric history*****Comparison study***

There was no significant difference between the MNNU mothers and the PNW mothers for adverse obstetric history combined ( $p=0.43$ ). Investigations or treatment for infertility was experienced by the 14% of women in both groups. Around one quarter of mothers in both groups (MNNU 25% and PNW 23%) had a previous miscarriage. A greater proportion of MNNU mothers (11%) compared with PNW mothers (5%) had a previous termination of pregnancy. Previous experience of a baby death had occurred to one MNNU mother only. There were no significant differences between the MNNU mothers and the PNW mothers for any individual adverse obstetric event.

***Randomised controlled trial***

There was no significant difference across the four trial arm groups of NNU mothers for adverse obstetric history combined ( $p=0.89$ ). Investigations or treatment for infertility had been experienced by 11% of the NNU mothers, 9% had previously terminated a pregnancy and 23% had a previous ectopic or miscarriage of pregnancy and 5% had experienced a stillbirth or neonatal death. There were no significant differences between the mothers in the four trial arm groups for any individual adverse obstetric events.

**Mothering experience*****Comparison study***

The PNW mothers were matched by mothering experience with the MNNU mothers therefore there was no significant difference between the two groups for mothering experience ( $p=0.52$ ). For 50% of the MNNU mothers and 59% of the PNW mothers this was their first mothering experience.

***Randomised controlled trial***

There was no significant difference for mothering experience across the four trial arm groups of NNU mothers ( $p=0.78$ ). For 58% this was their first mothering experience.

**Delivery type*****Comparison study***

There was no significant difference in the type of delivery between the MNNU mothers and the PNW mothers ( $p=0.30$ ). Fifty-four per cent (15) of MNNU mothers delivered their baby by Caesarean section, six under general anaesthetic and nine under epidural anaesthetic compared with 32% (7) of PNW mothers, one under general anaesthetic and six under epidural anaesthetic. Four mothers in both groups (14% MNNU and 18% PNW) had forceps/Ventouse deliveries and 32% (9) of MNNU and 50% (11) of PNW mothers had normal vaginal deliveries.

***Randomised controlled trial***

There was no significant difference in the delivery type between the four trial arm groups of the NNU mothers ( $p=0.42$ ). The majority of babies were delivered by Caesarean section, 22 (20%) under general anaesthetic and 40 (36%) under epidural anaesthetic, 12% were forceps/Ventouse deliveries and 32% were normal vaginal deliveries.

**Smoking*****Comparison study***

There was no significant difference in the smoking habits between the MNNU mothers and the PNW mothers. Twenty-five per cent (7) of MNNU and 18% (4) of the PNW mothers describe themselves as cigarette smokers ( $p=0.73$ ). Two MNNU mothers reported that they had stopped smoking during their pregnancy, which resulted in 18% of mothers in both groups who reported they smoked during pregnancy ( $p=1.00$ ). Regardless of maternal smoking habits, 39% (11) of MNNU mothers and 36% (8) PNW mothers reported other household smokers ( $p=0.83$ ).

***Randomised controlled trial***

At the time of the questionnaire, twenty-one mothers (19%) described themselves as cigarette smokers. This increased to 23 (21%) mothers who reported they had smoked during this last pregnancy. Thirty-six mothers (33%) reported that, regardless of their smoking habit, at least one other household member smoked. There was no significant difference across the four trial arm groups of NNU mothers for smoking ( $p=0.61$ ), smoked during pregnancy ( $p=0.56$ ) or other household smokers ( $p=0.68$ ).

### **Home tenure**

#### ***Comparison study***

There were no significant differences between the MNNU mothers and the PNW mothers for home tenure ( $p=0.67$ ). The majority, 82% of MNNU mothers and 77% of PNW mothers, owned their home, with or without a mortgage. Eleven per cent of MNNU mothers compared with 14% of PNW mothers rented their home from the local authority or a housing association and 4% of MNNU and 9% of PNW mothers rented their home as furnished or unfurnished accommodation from a private landlord or as an integral part of their employment. One MNNU mothers had an alternative style of home tenure.

#### ***Randomised controlled trial***

There was no difference in home tenure across the four trial arm groups of NNU mothers ( $p=0.41$ ). Eighty mothers (73%) owned their own home with or without a mortgage. Fifteen mothers (14%) rented their home from the local authority or a housing association whilst another 14 (13%) rented their home as part of their employment or as furnished or unfurnished accommodation from a private landlord. One mother (<1%) had another style of home tenure.

### **Telephone access**

#### ***Comparison study***

There was no significant difference between the MNNU mothers (96%) and the PNW mothers (86%) for domestic access to a telephone ( $p=0.31$ ). The one MNNU mother and the three PNW mothers who did not have a telephone in their home all had to rely exclusively on public telephones.

#### ***Randomised controlled trial***

There was no significant difference between the four trial arm groups of NNU mothers for domestic access to a telephone ( $p=0.99$ ). The majority ( $n=106$ ) of mothers (96%) had access to a telephone within their own home.

We have seen that the MNNU mothers and the PNW mothers within this sub set for the POMS-Bi analysis were representative of the total groups of mothers within the comparison study.

#### **Appendix 18 continued**

For the NNU mothers, the *p*-values indicated that, apart from the educational qualifications on leaving full time education there were no other significant differences in the maternal or baby characteristics across the four trial arm groups. These mothers were therefore largely representative of the total sample of NNU mothers. Therefore any significant differences in the mood states between the trial arm groups could reasonably be attributed to the effect of the 'Baby Helpline' or the 'Baby Check' interventions.

CORRELATION OF SIX MOOD STATES AT FOUR TIME POINTS

Correlation of six mood states of the Profile of Mood States Bi-Polar Form (POMS-Bi) at four time points for the matched neonatal unit mothers (n=28)

**Composed-Anxious mood state**

	Composed-Anxious discharge	Composed-Anxious 1 month	Composed-Anxious 2 months	Composed-Anxious 3 months
<b>Composed-Anxious discharge</b>	1.000	0.212 (p=0.279)	0.400 (p=0.035)	0.119 (p=0.547)
<b>Composed-Anxious 1 month</b>	0.212 (p=0.279)	1.000	0.779 (p<0.001)	0.894 (p<0.001)
<b>Composed-Anxious 2 months</b>	0.400 (p=0.035)	0.779 (p<0.001)	1.000	0.785 (p<0.001)
<b>Composed-Anxious 3 months</b>	0.119 (p=0.547)	0.894 (p<0.001)	0.785 (p<0.001)	1.000

**Agreeable-Hostile mood state**

	Agreeable-Hostile discharge	Agreeable-Hostile 1 month	Agreeable-Hostile 2 months	Agreeable-Hostile 3 months
<b>Agreeable-Hostile discharge</b>	1.000	0.097 (p=0.624)	0.182 (p=0.353)	-0.018 (p=0.928)
<b>Agreeable-Hostile 1 month</b>	0.094 (p=0.624)	1.000	0.668 (p<0.001)	0.639 (p<0.001)
<b>Agreeable-Hostile 2 months</b>	0.182 (p=0.353)	0.668 (p<0.001)	1.000	0.456 (p=0.015)
<b>Agreeable-Hostile 3 months</b>	-0.018 (p=0.928)	0.639 (p<0.001)	0.456 (p=0.015)	1.000

**Confident-Unsure mood state**

	Confident-Unsure discharge	Confident-Unsure 1 month	Confident-Unsure 2 months	Confident-Unsure 3 months
<b>Confident-Unsure discharge</b>	1.000	0.351 (p=0.067)	0.287 (p=0.139)	0.154 (p=0.434)
<b>Confident-Unsure 1 month</b>	0.351 (p=0.067)	1.000	0.596 (p=0.001)	0.804 (p<0.001)
<b>Confident-Unsure 2 months</b>	0.287 (p=0.139)	0.596 (p=0.001)	1.000	0.535 (p=0.003)
<b>Confident-Unsure 3 months</b>	0.154 (p=0.434)	0.804 (p<0.001)	0.535 (p=0.003)	1.000

**Energetic-Tired mood state**

	Energetic-Tired discharge	Energetic-Tired 1 month	Energetic-Tired 2 months	Energetic-Tired 3 months
<b>Energetic-Tired discharge</b>	1.000	0.149 ( <i>p</i> =0.450)	0.180 ( <i>p</i> =0.359)	0.077 ( <i>p</i> =0.698)
<b>Energetic-Tired 1 month</b>	0.149 ( <i>p</i> =0.450)	1.000	0.612 ( <i>p</i> =0.001)	0.814 ( <i>p</i> <0.001)
<b>Energetic-Tired 2 months</b>	0.180 ( <i>p</i> =0.359)	0.612 ( <i>p</i> =0.001)	1.000	0.583 ( <i>p</i> =0.001)
<b>Energetic-Tired 3 months</b>	0.077 ( <i>p</i> =0.698)	0.814 ( <i>p</i> <0.001)	0.583 ( <i>p</i> =0.001)	1.000

**Elated-Depressed mood state**

	Elated-Depressed discharge	Elated-Depressed 1 month	Elated-Depressed 2 months	Elated-Depressed 3 months
<b>Elated-Depressed discharge</b>	1.000	0.269 ( <i>p</i> =0.167)	0.422 ( <i>p</i> =0.025)	0.379 ( <i>p</i> =0.047)
<b>Elated-Depressed 1 month</b>	0.269 ( <i>p</i> =0.167)	1.000	0.575 ( <i>p</i> =0.001)	0.769 ( <i>p</i> <0.001)
<b>Elated-Depressed 2 months</b>	0.422 ( <i>p</i> =0.025)	0.575 ( <i>p</i> =0.001)	1.000	0.652 ( <i>p</i> <0.001)
<b>Elated-Depressed 3 months</b>	0.379 ( <i>p</i> =0.047)	0.769 ( <i>p</i> <0.001)	0.652 ( <i>p</i> <0.001)	1.000

**Clear headed-Confused mood state**

	Clear headed-Confused discharge	Clear headed-Confused 1 month	Clear headed-Confused 2 months	Clear headed-Confused 3 months
<b>Clear headed-Confused-discharge</b>	1.000	0.103 ( <i>p</i> =0.603)	0.224 ( <i>p</i> =0.251)	0.131 ( <i>p</i> =0.507)
<b>Clear headed-Confused- 1 month</b>	0.103 ( <i>p</i> =0.603)	1.000	0.557 ( <i>p</i> =0.002)	0.743 ( <i>p</i> <0.001)
<b>Clear headed-Confused- 2 months</b>	0.224 ( <i>p</i> =0.251)	0.557 ( <i>p</i> =0.002)	1.000	0.628 ( <i>p</i> <0.001)
<b>Clear headed-Confused- 3 months</b>	0.131 ( <i>p</i> =0.507)	0.743 ( <i>p</i> <0.001)	0.628 ( <i>p</i> <0.001)	1.000

These tables show the correlation between each of the six POMS-Bi mood state scores of the matched neonatal unit mothers at the time of the baby's discharge from the Neonatal Unit, and at one month, two and three months after their baby's discharge. There was a high correlation between the scores at one, two and three months after discharge, with the discharge score generally less well correlated. This suggests that the mood states of the matched neonatal unit mothers around the time of their baby's discharge home were different from those recorded after discharge or that the mood states recorded after discharge were more consistent.

**Correlation of six mood states of the Profile of Mood States Bi-Polar Form (POMS-Bi) at four time points for the postnatal ward mothers (n=22)**

**Composed-Anxious mood state**

	Composed-Anxious discharge	Composed-Anxious 1 month	Composed-Anxious 2 months	Composed-Anxious 3 months
<b>Composed-Anxious discharge</b>	1.000	0.518 ( <i>p</i> =0.014)	0.368 ( <i>p</i> =0.092)	0.447 ( <i>p</i> =0.037)
<b>Composed-Anxious 1 month</b>	0.518 ( <i>p</i> =0.014)	1.000	0.856 ( <i>p</i> <0.001)	0.913 ( <i>p</i> <0.001)
<b>Composed-Anxious 2 months</b>	0.368 ( <i>p</i> =0.092)	0.856 ( <i>p</i> <0.001)	1.000	0.824 ( <i>p</i> <0.001)
<b>Composed-Anxious 3 months</b>	0.447 ( <i>p</i> =0.037)	0.913 ( <i>p</i> <0.001)	0.824 ( <i>p</i> <0.001)	1.000

**Agreeable-Hostile mood state**

	Agreeable-Hostile discharge	Agreeable-Hostile 1 month	Agreeable-Hostile 2 months	Agreeable-Hostile 3 months
<b>Agreeable-Hostile discharge</b>	1.000	0.600 ( <i>p</i> =0.003)	0.214 ( <i>p</i> =0.338)	0.447 ( <i>p</i> =0.037)
<b>Agreeable-Hostile 1 month</b>	0.600 ( <i>p</i> =0.003)	1.000	0.728 ( <i>p</i> <0.001)	0.803 ( <i>p</i> <0.001)
<b>Agreeable-Hostile 2 months</b>	0.214 ( <i>p</i> =0.338)	0.728 ( <i>p</i> <0.001)	1.000	0.685 ( <i>p</i> <0.001)
<b>Agreeable-Hostile 3 months</b>	0.447 ( <i>p</i> =0.037)	0.803 ( <i>p</i> <0.001)	0.685 ( <i>p</i> <0.001)	1.000

**Confident-Unsure mood state**

	Confident-Unsure discharge	Confident-Unsure 1 month	Confident-Unsure 2 months	Confident-Unsure 3 months
<b>Confident-Unsure discharge</b>	1.000	0.553 ( <i>p</i> =0.008)	0.176 ( <i>p</i> =0.434)	0.213 ( <i>p</i> =0.342)
<b>Confident-Unsure 1 month</b>	0.553 ( <i>p</i> =0.008)	1.000	0.500 ( <i>p</i> =0.018)	0.628 ( <i>p</i> =0.002)
<b>Confident-Unsure 2 months</b>	0.176 ( <i>p</i> =0.434)	0.500 ( <i>p</i> =0.018)	1.000	0.435 ( <i>p</i> =0.043)
<b>Confident-Unsure 3 months</b>	0.213 ( <i>p</i> =0.342)	0.628 ( <i>p</i> =0.002)	0.435 ( <i>p</i> =0.043)	1.000

**Energetic-Tired mood state**

	Energetic-Tired discharge	Energetic-Tired 1 month	Energetic-Tired 2 months	Energetic-Tired 3 months
<b>Energetic-Tired discharge</b>	1.000	0.697 ( <i>p</i> <0.001)	0.243 ( <i>p</i> =0.276)	0.228 ( <i>p</i> =0.308)
<b>Energetic-Tired 1 month</b>	0.697 ( <i>p</i> <0.001)	1.000	0.364 ( <i>p</i> =0.096)	0.406 ( <i>p</i> =0.061)
<b>Energetic-Tired 2 months</b>	0.243 ( <i>p</i> =0.276)	0.364 ( <i>p</i> =0.096)	1.000	0.632 ( <i>p</i> =0.002)
<b>Energetic-Tired 3 months</b>	0.228 ( <i>p</i> =0.308)	0.406 ( <i>p</i> =0.061)	0.632 ( <i>p</i> =0.002)	1.000

**Elated-Depressed mood state**

	Elated-Depressed discharge	Elated-Depressed 1 month	Elated-Depressed 2 months	Elated-Depressed 3 months
<b>Elated-Depressed discharge</b>	1.000	0.665 ( <i>p</i> =0.001)	0.252 ( <i>p</i> =0.258)	0.505 ( <i>p</i> =0.017)
<b>Elated-Depressed 1 month</b>	0.665 ( <i>p</i> =0.001)	1.000	0.465 ( <i>p</i> =0.029)	0.764 ( <i>p</i> <0.001)
<b>Elated-Depressed 2 months</b>	0.252 ( <i>p</i> =0.258)	0.465 ( <i>p</i> =0.029)	1.000	0.600 ( <i>p</i> =0.003)
<b>Elated-Depressed 3 months</b>	0.505 ( <i>p</i> =0.017)	0.764 ( <i>p</i> <0.001)	0.600 ( <i>p</i> =0.003)	1.000

**Clear headed-Confused mood state**

	Clear headed-Confused discharge	Clear headed-Confused 1 month	Clear headed-Confused 2 months	Clear headed-Confused 3 months
<b>Clear headed-Confused-discharge</b>	1.000	0.734 ( <i>p</i> <0.001)	0.370 ( <i>p</i> =0.090)	0.541 ( <i>p</i> =0.009)
<b>Clear headed-Confused- 1 month</b>	0.734 ( <i>p</i> <0.001)	1.000	0.608 ( <i>p</i> =0.003)	0.823 ( <i>p</i> <0.001)
<b>Clear headed-Confused- 2 months</b>	0.370 ( <i>p</i> =0.090)	0.608 ( <i>p</i> =0.003)	1.000	0.636 ( <i>p</i> =0.001)
<b>Clear headed-Confused-3 months</b>	0.541 ( <i>p</i> =0.009)	0.823 ( <i>p</i> <0.001)	0.636 ( <i>p</i> =0.001)	1.000

These tables also show high correlation between each of the six POMS-Bi mood state scores for the postnatal ward mothers at the time of the baby's discharge home and at one, two and three months after discharge. Generally the scores at one, two and three months were more highly correlated than at discharge. This suggests that the mothers' mood states around the time of the baby's discharge home were slightly different from those recorded after discharge or the mood states recorded at one, two and three months after discharge were more stable.

**Correlation of six mood states of the Profile of Mood States Bi-Polar Form (POMS-Bi) at four time points for the neonatal unit mothers (n=110)**

**Composed-Anxious mood state**

	Composed-Anxious discharge	Composed-Anxious 1 month	Composed-Anxious 2 months	Composed-Anxious 3 months
<b>Composed-Anxious discharge</b>	1.000	0.327 ( <i>p</i> <0.001)	0.341 ( <i>p</i> <0.001)	0.259 ( <i>p</i> =0.006)
<b>Composed-Anxious 1 month</b>	0.327 ( <i>p</i> <0.001)	1.000	0.809 ( <i>p</i> <0.001)	0.862 ( <i>p</i> <0.001)
<b>Composed-Anxious 2 months</b>	0.341 ( <i>p</i> <0.001)	0.809 ( <i>p</i> <0.001)	1.000	0.823 ( <i>p</i> <0.001)
<b>Composed-Anxious 3 months</b>	0.259 ( <i>p</i> =0.006)	0.862 ( <i>p</i> <0.001)	0.823 ( <i>p</i> <0.001)	1.000

**Agreeable-Hostile mood state**

	Agreeable-Hostile discharge	Agreeable-Hostile 1 month	Agreeable-Hostile 2 months	Agreeable-Hostile 3 months
<b>Agreeable-Hostile discharge</b>	1.000	0.325 ( <i>p</i> =0.001)	0.269 ( <i>p</i> =0.005)	0.251 ( <i>p</i> =0.008)
<b>Agreeable-Hostile 1 month</b>	0.325 ( <i>p</i> =0.001)	1.000	0.631 ( <i>p</i> <0.001)	0.521 ( <i>p</i> <0.001)
<b>Agreeable-Hostile 2 months</b>	0.269 ( <i>p</i> =0.005)	0.631 ( <i>p</i> <0.001)	1.000	0.626 ( <i>p</i> <0.001)
<b>Agreeable-Hostile 3 months</b>	0.251 ( <i>p</i> =0.008)	0.521 ( <i>p</i> <0.001)	0.626 ( <i>p</i> <0.001)	1.000

**Confident-Unsure mood state**

	Confident-Unsure discharge	Confident-Unsure 1 month	Confident-Unsure 2 months	Confident-Unsure 3 months
<b>Confident-Unsure discharge</b>	1.000	0.430 ( <i>p</i> <0.001)	0.317 ( <i>p</i> =0.001)	0.221 ( <i>p</i> =0.020)
<b>Confident-Unsure 1 month</b>	0.430 ( <i>p</i> <0.001)	1.000	0.632 ( <i>p</i> <0.001)	0.619 ( <i>p</i> <0.001)
<b>Confident-Unsure 2 months</b>	0.317 ( <i>p</i> =0.001)	0.632 ( <i>p</i> <0.001)	1.000	0.617 ( <i>p</i> <0.001)
<b>Confident-Unsure 3 months</b>	0.221 ( <i>p</i> =0.020)	0.619 ( <i>p</i> <0.001)	0.617 ( <i>p</i> <0.001)	1.000

**Energetic-Tired mood state**

	Energetic-Tired discharge	Energetic-Tired 1 month	Energetic-Tired 2 months	Energetic-Tired 3 months
<b>Energetic-Tired discharge</b>	1.000	0.439 ( <i>p</i> <0.001)	0.360 ( <i>p</i> <0.001)	0.185 ( <i>p</i> =0.054)
<b>Energetic-Tired 1 month</b>	0.439 ( <i>p</i> <0.001)	1.000	0.687 ( <i>p</i> <0.001)	0.646 ( <i>p</i> <0.001)
<b>Energetic-Tired 2 months</b>	0.360 ( <i>p</i> <0.001)	0.687 ( <i>p</i> <0.001)	1.000	0.589 ( <i>p</i> <0.001)
<b>Energetic-Tired 3 months</b>	0.185 ( <i>p</i> =0.054)	0.646 ( <i>p</i> <0.001)	0.589 ( <i>p</i> <0.001)	1.000

**Elated-Depressed mood state**

	Elated-Depressed discharge	Elated-Depressed 1 month	Elated-Depressed 2 months	Elated-Depressed 3 months
<b>Elated-Depressed discharge</b>	1.000	0.238 ( <i>p</i> =0.012)	0.269 ( <i>p</i> =0.005)	0.251 ( <i>p</i> =0.008)
<b>Elated-Depressed 1 month</b>	0.238 ( <i>p</i> =0.012)	1.000	0.636 ( <i>p</i> <0.001)	0.667 ( <i>p</i> <0.001)
<b>Elated-Depressed 2 months</b>	0.269 ( <i>p</i> =0.005)	0.636 ( <i>p</i> <0.001)	1.000	0.677 ( <i>p</i> <0.001)
<b>Elated-Depressed 3 months</b>	0.251 ( <i>p</i> =0.008)	0.667 ( <i>p</i> <0.001)	0.677 ( <i>p</i> <0.001)	1.000

**Clear headed-Confused mood state**

	Clear headed-Confused discharge	Clear headed-Confused 1 month	Clear headed-Confused 2 months	Clear headed-Confused 3 months
<b>Clear headed-Confused-discharge</b>	1.000	0.288 ( <i>p</i> =0.002)	0.255 ( <i>p</i> =0.007)	0.153 ( <i>p</i> =0.109)
<b>Clear headed-Confused- 1 month</b>	0.288 ( <i>p</i> =0.002)	1.000	0.585 ( <i>p</i> <0.001)	0.639 ( <i>p</i> <0.001)
<b>Clear headed-Confused- 2 months</b>	0.255 ( <i>p</i> =0.007)	0.585 ( <i>p</i> <0.001)	1.000	0.636 ( <i>p</i> <0.001)
<b>Clear headed-Confused- 3 months</b>	0.153 ( <i>p</i> =0.109)	0.639 ( <i>p</i> <0.001)	0.636 ( <i>p</i> <0.001)	1.000

These tables show a high correlation between each of the six mood states for the NNU mothers at the time of their baby's discharge home, and at one month, two months and three months after their baby's discharge. Generally, the one, two and three month scores were more correlated than the score recorded around the time of their baby's discharge home except for the energetic-tired and clear headed-confused mood dimensions at three months after discharge. The implication is that the mood state scores of the NNU mothers recorded around the time of their baby's discharge home were slightly different from the moods recorded at one, two and three months following their baby's discharge. Alternatively, the mood states became more stable one month after discharge home and remained stable during the second and third month following the baby's discharge home.

**CORRELATION OF THE SPIELBERGER STATE TRAIT ANXIETY INVENTORY AND  
THE PROFILE OF MOOD STATES BI-POLAR FORM**

The strength of the relationship between the Spielberger State Trait Anxiety Inventory (STAI) and the Profile of Mood States Bi-Polar Form (POMS-Bi) scores are given in tables A, B and C.

**Table A Correlation between the STAI and POMS-Bi scores for the postnatal ward mothers (n=20)**

Mood state	Trait-anxiety	First state-anxiety	Second state-anxiety
<b>Agreeable- Hostile</b>	-0.752 (p<0.001)	-0.666 (p=0.001)	-0.711 (p<0.001)
<b>Composed- Anxious</b>	-0.621 (p<0.001)	-0.660 (p=0.002)	-0.721 (p<0.001)
<b>Clear headed- Confused</b>	-0.553 (p=0.011)	-0.605 (p=0.005)	-0.719 (p<0.001)
<b>Confident- Unsure</b>	-0.532 (p=0.016)	-0.569 (p=0.009)	-0.717 (p<0.001)
<b>Elated- Depressed</b>	-0.591 (p=0.006)	-0.615 (p=0.004)	-0.767 (p<0.001)
<b>Energetic- Tired</b>	-0.520 (p=0.019)	-0.599 (p=0.005)	-0.651 (p=0.002)

Two mothers who completed the POMS-Bi assessment did not complete the STAI assessment.

**Table B Correlation between the STAI and POMS-BI scores for the matched neonatal unit mothers (n=23)**

Mood state	Trait-anxiety	First state-anxiety	Second state-anxiety
<b>Agreeable- Hostile</b>	-0.655 (p=0.001)	-0.667 (p=0.001)	-0.615 (p=0.002)
<b>Composed- Anxious</b>	-0.878 (p<0.001)	-0.833 (p<0.001)	-0.852 (p<0.001)
<b>Clear headed- Confused</b>	-0.720 (p<0.001)	-0.817 (p<0.001)	-0.902 (p<0.001)
<b>Confident- Unsure</b>	-0.748 (p<0.001)	-0.794 (p<0.001)	-0.756 (p<0.001)
<b>Elated- Depressed</b>	-0.830 (p<0.001)	-0.710 (p<0.001)	-0.831 (p<0.001)
<b>Energetic- Tired</b>	-0.788 (p<0.001)	-0.603 (p=0.002)	-0.752 (p<0.001)

Five of the mothers who completed the POMS-Bi assessment did not complete the STAI assessment.

**Table C** Correlation between the STAI and POMS-Bi scores for the neonatal unit mothers (n=102)

Mood state	Trait-anxiety	First state-anxiety	Second state-anxiety
<b>Agreeable-Hostile</b>	-0.422 ( <i>p</i> =0.001)	-0.547 ( <i>p</i> <0.001)	-0.604 ( <i>p</i> <0.001)
<b>Composed-Anxious</b>	-0.422 ( <i>p</i> <0.001)	-0.734 ( <i>p</i> <0.001)	-0.685 ( <i>p</i> <0.001)
<b>Clear headed-Confused</b>	-0.373 ( <i>p</i> <0.001)	-0.660 ( <i>p</i> <0.001)	-0.682 ( <i>p</i> <0.001)
<b>Confident-Unsure</b>	-0.390 ( <i>p</i> <0.001)	-0.643 ( <i>p</i> <0.001)	-0.683 ( <i>p</i> <0.001)
<b>Elated-Depressed</b>	-0.303 ( <i>p</i> =0.002)	-0.570 ( <i>p</i> <0.001)	-0.750 ( <i>p</i> <0.001)
<b>Energetic-Tired</b>	-0.249 ( <i>p</i> =0.012)	-0.444 ( <i>p</i> <0.001)	-0.592 ( <i>p</i> <0.001)

Eight mothers who completed the POMS-BI assessments did not complete the STAI assessments.

Tables A, B and C show that mothers who scored high on the STAI scale, which indicated greater anxiety, also scored low on the POMS-Bi scales, which indicated more negative mood states. The *p*-values indicate the significance of these highly correlated results which indicated that the STAI and POMS-Bi were measuring the concept of emotional health in a similar way.

**CHARACTERISTICS OF THE NEONATAL UNIT MOTHERS THAT INFLUENCED THE  
CHANGE IN MOOD STATES BETWEEN THEIR BABY'S DISCHARGE HOME AND ONE  
MONTH FOLLOWING DISCHARGE**

**Characteristics identified by univariate analysis**

Univariate or single variable analysis of the mother and baby characteristics that significantly influenced the change in mood scores of the neonatal unit mothers between the scores recorded around the time of their baby's discharge home and one month following discharge were investigated and are shown in the table over the page. Only characteristic variables significant at the 5% level are presented.

**Characteristics that influenced the change in mood of the neonatal unit mothers between their baby's discharge home and one month following discharge (n=110)**

Characteristics	Composed-Anxious	Agreeable-Hostile	Elated-Depressed	Confident-Unsure	Energetic-Tired	Clear headed-Confused
Maternal age		✓ <i>p=0.03</i>				
Delivery type				✓ <i>p=0.008</i>		✓ <i>p=0.05</i>
Birth weight	✓ <i>p=0.04</i>			✓ <i>p=0.03</i>	✓ <i>p=0.02</i>	✓ <i>p=0.01</i>
Gestation at birth				✓ <i>p=0.02</i>		✓ <i>p=0.04</i>
Birth at 32 or less weeks gestation and /or 1.5Kg or less birth weight	✓ <i>p=0.04</i>					✓ <i>p=0.03</i>
Length of stay						✓ <i>p=0.02</i>

✓ = significant characteristic for the mood state

## Appendix 21 continued

The table shows the mother and baby characteristic variables that were significant for the change in mood states of the neonatal unit mothers between the scores recorded around the time of their baby's discharge home and one month following discharge. The significant characteristics that influence mood change and the directions of change were:-

### **Influence of maternal age**

The older the mother the more negative the mood change on the agreeable –hostile scale which indicated they were relatively less agreeable over time ( $p=0.03$ ).

### **Influence of delivery type**

The mood of mothers who had a Caesarean section under general anaesthetic changed significantly in a negative direction in relation to their baseline score recorded at the time of discharge home, they were relatively less confident ( $p=0.008$ ) and less clear headed ( $p=0.05$ ) compared with mothers who had a normal delivery.

### **Influence of birth weight**

As birth weight increased the change in mood significantly improved. Mothers who gave birth to a heavier baby were significantly more composed ( $p=0.04$ ), more confident ( $p=0.03$ ), more energetic ( $p=0.02$ ) and more clear headed ( $p=0.01$ ) one month after discharge than they indicated at the time of their baby's discharge home compared with the change of mood of mothers of lower birth weight babies.

### **Influence of gestation at birth**

The earlier the neonatal unit mothers gave birth the less confident ( $p=0.02$ ) and less clear headed ( $p=0.04$ ) they were at one month after discharge than they reported around the time of their baby's discharge home compared with mothers who delivered their baby at an older gestation.

### **Influence of birth at 32 or less weeks gestation and/or 1.5Kg or less birth weight**

Mothers with a baby born at 32 or less weeks gestation and/or 1.5Kg or less birth weight showed that they improved significantly less on the mood scales and they were less composed ( $p=0.04$ ) and less clear headed ( $p=0.03$ ) compared with mothers who delivered more mature and/or heavier babies.

### **Influence of length of stay**

For mothers whose baby stayed on the Neonatal Unit for 7 days or less, their change in mood was significantly more clear headed ( $p=0.02$ ) compared with mothers of babies who stayed in the Neonatal Unit for one month or more at one month following the baby's discharge home than they recorded around the time of the baby's discharge home.

Therefore the univariate analysis of the magnitude of relative change in the mood states of neonatal unit mothers between the scores recorded around the time of their baby's discharge home and the scores recorded one month following discharge were significantly influenced by both mother and baby characteristic variables. Maternal age and delivery type were the only maternal characteristics that were significant for the change in mood between discharge and one month. Although the baby characteristics appear to dominate the picture of significance for the change in mood state, birth weight and gestation at birth are highly correlated and inter-related with length of stay. Therefore we need to refer to the results of the multivariate analysis to discover which of the baby characteristics were the dominant variables.

### **Characteristics identified by multivariate analysis**

A multivariate model was used to investigate the interrelationship of significant variables on the magnitude of change in the POMS-Bi scores of the neonatal unit mothers recorded at the baseline, around the time of their baby's discharge home, and at one month following discharge, the findings are shown in the table below. The multivariate model was used with and without the baseline score to exclude a 'baseline effect' on the magnitude of mood change. Therefore, if significant values did not persist with the baseline score included in the model, the significant change in mood found between the two time points was probably due to a difference from the baseline score rather than the variable. Only characteristic variables significant at the 5% level are presented.

**Multivariate analysis of the characteristics of the neonatal unit mothers that influenced the change in mood of between their baby's discharge home and one month after discharge (n=110)**

Characteristic	Effect on mood change between scores at discharge and the scores 1 month later	Effect on mood change between scores at discharge and the scores 1 month later including baseline score
<b>COMPOSED-ANXIOUS MOOD STATE</b>		
Birth weight*	2.2 ( $p=0.04$ )	
<b>AGREEABLE-HOSTILE MOOD STATE</b>		
Maternal age*	-0.5 ( $p=0.04$ )	
<b>CONFIDENT-UNSURE MOOD STATE</b>		
Gestation at birth	$p=0.005$	$p=0.02$
24-29 weeks	-14.5 ( $p=0.001$ )	-10.8 ( $p=0.003$ )
30-32 weeks	-4.8 ( $p=0.11$ )	-1.7 ( $p=0.51$ )
33-37 weeks	-8.1 ( $p=0.006$ )	-5.4 ( $p=0.03$ )
38-39 weeks	-3.0 ( $p=0.37$ )	-2.9 ( $p=0.32$ )
40+ weeks	baseline group	baseline group
Delivery type	$p=0.002$	$p=0.001$
Caesarean section-general	-10.9 ( $p=<0.001$ )	-9.8 ( $p=<0.001$ )
Caesarean section-epidural	-3.4 ( $p=0.15$ )	-4.3 ( $p=0.03$ )
Forceps/Ventouse	-3.6 ( $p=0.31$ )	-5.0 ( $p=0.10$ )
Normal vaginal delivery	baseline group	baseline group
<b>CLEAR HEADED-CONFUSED MOOD STATE</b>		
Gestation at birth	$p=0.02$	
24-29 weeks	-15.6 ( $p=0.001$ )	
30-32 weeks	-8.2 ( $p=0.02$ )	
33-37 weeks	-6.9 ( $p=0.04$ )	
38-39 weeks	-4.0 ( $p=0$ )	
40+ weeks	baseline group	
Delivery type	$p=0.02$	$p=0.05$
Caesarean section-general	-8.8 ( $p=0.007$ )	-7.2 ( $p=0.008$ )
Caesarean section-epidural	-0.1 ( $p=0.97$ )	-1.9 ( $p=0.39$ )
Forceps/Ventouse	-4.9 ( $p=0.24$ )	-4.4 ( $p=0.17$ )
Normal vaginal delivery	baseline group	baseline group

\* = continuous variable

The table shows the results of multivariate analysis of the interrelationship between multiple variables that effected the change in the mood states scores of the neonatal unit mothers between the scores recorded around the time of their baby's discharge home and one month following discharge. Only the variables with the strongest impact on the mood change remained significant. When the baseline score which was recorded around the time of the baby's discharge home was added to the model, a highly significant negative change in mood ( $p<0.001$ ) for all six mood states indicated that the higher or more positive the baseline score the smaller the change in the mothers mood at one month after their baby's discharge home.

The findings from the multivariate analysis of mother and baby characteristic variables on the magnitude of change in mood states of the neonatal unit mothers between the scores

recorded around the time of their baby's discharge home and one month following discharge were:-

#### **Influences on the composed-anxious mood state**

Birth weight remained the significant variable for the change in the composed-anxious mood dimension ( $p=0.04$ ). As birth weight increased mothers improved on the mood scale by 2.2 points, therefore the bigger the baby the greater the improvement in mood between the baby's discharge home and at one month after discharge.

#### **Influences on the agreeable-hostile mood state**

Maternal age significantly affected the change in mood for the agreeable-hostile mood dimension ( $p=0.04$ ). For every increasing year of age mothers became less agreeable by 0.5 points per year of age compared with younger mothers.

#### **Influences on the confident-unsure mood state**

Gestation at birth was significant for the negative change in maternal scores on the confident-unsure mood dimension ( $p=0.005$ ). All mothers who delivered their baby at less than 40 weeks of gestation showed a negative change in mood compared with those who delivered their baby at 40 or more weeks of gestation. However, the difference was only significant for those born prematurely and the earlier the baby was born the greater the negative change. Mothers who delivered their baby between 24-29 weeks changed by 14.5 points towards the unsure pole of the scale ( $p=0.001$ ). When birth occurred between 33-37 weeks mothers changed by 8.1 points less confident ( $p=0.006$ ) than mothers who delivered their baby at 40 or more weeks gestation. When the baseline score was included in the model the difference in negative change in mood remained significant for 24-29 weeks ( $p=0.003$ ) and 33-37 weeks of gestation ( $p=0.03$ ) compared with mothers who delivered their baby at term.

Delivery type remained significant for the change in the confident-unsure mood dimension ( $p=0.002$ ). Compared with normal vaginal delivery, all other types of delivery showed a negative change in mood for the mothers between the baby's discharge home and one month later. For those who had a Caesarean section under general anaesthetic the negative mood change was 10.9 points towards the unsure pole of the confident-unsure scale ( $p<0.001$ ). When the baseline score was included in the model, Caesarean section under both general and epidural anaesthetic remained significant

## Appendix 21 continued

( $p<0.001$  and  $p=0.03$  respectively) and the mood change was relatively less confident compared with mothers who had a normal delivery.

### **Influences on the clear headed-confused mood state**

Gestation at birth remained a significant baby characteristic variable for the change in the clear headed-confused mood dimension ( $p=0.02$ ). The direction of mood change was negative and increased the earlier the baby was born but was only significant for those mothers whose baby was born prematurely compared with mothers who delivered at 40 or more weeks of gestation. The mood change in mothers who gave birth between 24-29 weeks of gestation decreased by 15.6 points ( $p=0.001$ ), mothers who gave birth at 30-32 weeks of gestation decreased by 8.2 points ( $p=0.02$ ) and those who delivered at 33-37 weeks of gestation decreased by 6.9 points ( $p=0.04$ ). This change of mood was towards the confused pole of the mood dimension compared with mothers who delivered their baby at 40 weeks or more of gestation.

Delivery type remained significant for the change in the clear headed-confused mood dimension ( $p=0.02$ ). The direction of change was negative for all delivery types compared with normal vaginal delivery but the magnitude of change was only significant for Caesarean section under general anaesthetic. Mothers who had their baby delivered by Caesarean section under general anaesthetic decreased by 8.8 points on the scale and became relatively less clear headed compared with those who had a normal vaginal delivery ( $p=0.007$ ). This significant difference in mood change remained when the baseline score was included in the model ( $p=0.008$ ).

Therefore we can conclude that for the neonatal unit mothers, the change in their mood profile between the time that their baby was discharged home and one month later was significantly influenced by their age, the gestation at which their baby was born, the type of delivery and the birth weight of their baby.

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Baby Check Ltd. (no date) *Baby Check*, [booklet obtained from Baby Check, Wroxham, Norwich NR12 8EQ, tel: 0603784400]