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Using the Theory of Planned Behaviour to explore the intentions of a multicultural nursing workforce to comply with policies and procedures in the Prince Sultan Military Medical City (PSMMC)

by

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ABSTRACT

FACULTY OF HEALTH SCIENCES

Thesis for the degree of Doctor of Clinical Practice

USING THE THEORY OF PLANNED BEHAVIOUR TO EXPLORE THE INTENTIONS OF A MULTICULTURAL NURSING WORKFORCE TO COMPLY WITH POLICIES AND PROCEDURES IN THE PRINCE SULTAN MILITARY MEDICAL CITY (PSMMC)

Ahmed Ali Yami

The nursing shortage in the Kingdom of Saudi Arabia (KSA) causes administrative difficulties and increases worries about the quality of healthcare being provided, as well as contributing to the employment of a multicultural nursing workforce. Evidence indicates that, although nurses are increasingly compliant with nursing policies and procedures to ensure a higher quality of nursing care, there is still a wide variance in that compliance. The Theory of Planned Behaviour (TPB) is a social cognitive model of behaviour used to investigate attitudes and behavioural relationships and to understand individuals' behavioural intentions in relation to their performance. However, the TPB has not been previously used to attempt to explain this variance in a multicultural nursing workforce.

The aim of this study was to examine the usefulness of the TPB in explaining variations in nurses' intentions to comply with the pre-operative skin preparation policy.

This study consisted of two phases, both conducted within a large military hospital in the KSA. The first phase, an elicitation study, was carried out to identify salient beliefs about compliance behaviour held by nurses working in general surgical areas. The findings from the elicitation study were used to develop the final theory-based questionnaire developed to understand the beliefs underpinning nurses' intention to comply with the pre-operative skin preparation policy.

The second phase of the study involved an anonymous and self-administered questionnaire designed to assess the variables in the TPB. The instrument included measures of behavioural intention to comply with pre-operative skin preparation policy, attitudes, subjective norms and Perceived Behavioural Control (PBC). Due to data that were not normally distributed, behavioural intention was dichotomised into high behavioural intention and low behavioural intention. A logistic regression analysis was used to test the relationships between the behavioural intention and the TPB variables.

The results revealed that the TPB model explained up to 40% of variance in behavioural intention to comply with the pre-operative skin preparation policy, X^2 (5, N=229)= 21.5, P<0.05. Results showed that attitudes (Odds Ratio= 3.86, 95% Confidence Interval= 2.07-7.20, P<0.05) and subjective norms were the significant predictors of nurses' high behavioural intentions. However, PBC (Odds ratio 1.30, 95% CI= 0.81-2.09, P>0.05) was not.

In conclusion, the findings of this study support the usefulness of the TPB model in predicting nurses' intentions to comply with a pre-operative skin preparation policy. The results could be used to develop effective intervention strategies based on the nurses' beliefs that underpin their behavioural intention to comply

with hospital guidelines and policies. However, future research can confirm the result of this study and expanding the list of contextual variables.

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DECLARATION OF AUTHORSHIP

I, AHMED ALI M. Yami declare that the thesis entitled **'Using the Theory of Planned Behaviour to explore the intentions of a multicultural nursing workforce to comply with policies and procedures in Prince Sultan Military Medical City (PSMMC)'**, and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research. I confirm that:

- This work was done wholly or mainly while in candidature for a research degree at the University of Southampton;
- Where any part of this thesis has previously has been submitted for a degree or any other qualification at University of Southampton or any institution, this has been clearly stated;
- Where I have consulted the published work of others, this is always clearly attributed;
- Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
- I have acknowledged all main sources of help;
- Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
- None of this work has been published before submission, or [delete as appropriate] parts of this work have been published as: [please list references below]

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This thesis is dedicated to my father and my mother who encouraged me to travel overseas to further my postgraduate studies; whereas, they are actually needed me to be there to look after them. Finally, special thanks to my wife for her invaluable encouragement, psychological support, and patient understanding during the years of my research and my children Ali, Aleen and Iyad for their cheerful smiles and patience, which reduced the tension and overcome barriers that I have faced during the preparation of my thesis.

Definitions of terms

The following is a list of terms used throughout the thesis:

1. Multicultural nursing workforce: refers to registered nurses with different cultural norms, beliefs, behaviours, knowledge, genders, customs and skills from the country in which they work (Paul 2009).
2. Compliance: is defined as the degree of constancy and accuracy with which the nursing workforce follows a given policy (Efstathiou et al. 2011; Haynes et al. 1979).
3. Behavioural Intention: it is defined as the most accurate determinant of behaviour that reflects how a person perceived possibility or subjective likelihood to perform a particular behaviour (Ajzen & Fishbein 1980).
4. Attitude: an attitude represents the degree to which a person has a favourable or unfavourable feeling toward the behaviour (Ajzen 1991).
5. Subjective Norm: it reflects a person's beliefs about the perceived social pressure to perform or not to perform specific behaviour (Ajzen 1991).
6. Perceived Behavioural Control (PBC): it is defined as perceptions of factors that would facilitate, or make difficult, performing of specific behaviour (Ajzen 1991).

Glossary of abbreviations

ABBREVIATION	MEANING
AIDS	Acquired Immunodeficiency Syndrome
ERGO	Electronic Research Governance Online
HBM	Health Belief Model
HIV	Human Immunodeficiency Virus
KSA	Kingdom of Saudi Arabia
MOH	Ministry of Health
PBC	Perceived Behavioural Control
PSMMC	Prince Sultan Military Medical City
SARS	Severe Acute Respiratory Syndrome
SCT	Social Cognitive Theory
SPSS	Statistical Package for Social Sciences
TACT	Target, Action, Context and Time
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UoS	University of Southampton

Chapter 1: Introduction

1.1 Background

The Kingdom of Saudi Arabia (KSA) is one of the richest and most rapidly developing countries in the Gulf Cooperation Council (GCC) (Aldossary et al. 2008). The country's increase in wealth has contributed to a growing population, which is a main driver of rising demands for good quality healthcare. The healthcare system in the KSA provides advanced patient care services resulting from the implementation of an effective government strategy framework that aims to improve the quality of healthcare services (Al-Ahmadi & Roland 2005). However, there is a chronic shortage of Saudi health professionals, especially nurses. In the KSA, the healthcare system is mainly staffed by international nurses who comprise 70.9% of the total Saudi nursing workforce employed in Saudi hospitals (Almalki et al. 2011). This has given rise to a multicultural nursing population working in Saudi hospitals (Jackson et al. 2001; Spetz & Given 2003), a situation which needs monitoring in order to ensure and enhance safety, as well as the quality of nursing practice (Almutairi et al. 2012: Aldossary et al. 2008). In addition, working in a multicultural nursing workplace is challenging, and such a dynamic environment can have a complex and sometimes unpredictable impact on nurses' compliance with their hospital's nursing policies and procedures (Almutairi et al. 2012; Troy et al. 2007). Several studies have indicated that the behavioural intentions of the members of a multicultural nursing workforce, towards the compliance with nursing policies and procedures, are influenced by attitudes, beliefs and social experiences, imported as part of their background and /or learned from their current place of employment (Godin et al. 2000; Almutairi & McCarthy 2012; Creedon 2006).

In this context, nursing compliance with policies and procedures is highly significant in that nurses' adherence to such requirement should ensure the underlying safety and quality of patient healthcare (Efstathiou et al. 2011; Creedon 2005). Although Lau and colleagues (2010) have argued that nurses are still not fully compliant with policies and procedures, the promotion of evidence-based clinical policies is highly recommended (Bischoff et al. 2000; Farr 2000). Therefore, the sustained improvement of nursing compliance with relevant

healthcare and hospital policies requires a comprehensive approach, incorporating behavioural aspects, in order to improve the quality of nursing practice and performance (Leventhal & Cameron 1987; Seto 1995; Creedon 2006). This chapter presents a review of the current healthcare situation in the KSA, followed by details of the KSA's problem of the nursing shortage in its health system. These details will include the explanation of factors that have been shown to be important in understanding the relationship between compliance behaviour and nursing policies and procedures, such as the nurses' negative attitudes, behavioural norms and beliefs (Pittet et al. 1999; Ploeg et al. 2007).

1.2 Healthcare in the Kingdom of Saudi Arabia (KSA)

The KSA is one of the largest countries in the Middle East. It covers approximately 2.24 Million square kilometres, which is about 80% of the total area of the Arabian Peninsula (Almalki et al. 2011; Aldossary et al. 2008). The KSA is one of the largest oil exporters in the world, having approximately 25% of the world's oil reserves (Aldossary et al. 2008). In recent decades, the country's oil wealth has precipitated a rapid growth in the population, causing a challenging, even negative, impact on the healthcare services (Aldossary et al. 2008; Aboul-Enein 2002; Tumulty 2001; Almalki et al. 2011). For example, the latest population figures show that the KSA reached a population of 22.7 million in 2004, as compared to 18.5 million in 1997 (Central Department of Statistics and Information 2007). Almalki et al. (2011) reported that the annual population growth rate from 2004 to 2010 was 3.2% per year. A demographic shift of this magnitude constitutes a serious challenge to my nation's public services, especially those relating to healthcare. Schieber (2001) predicted that, by 2020, the KSA will have continued to grow at an average annual rate of 2.8%, leading to a 75% increase in the country's population. However, it is estimated that the Saudi's population will approach 39.8 million by 2025 and 54.7 million by 2050 (United Nations 2008). Therefore, this unprecedented growth is a main driver of the rising demand for essential services, including those services relevant to good quality healthcare (Almalki et al. 2011).

Al-Yousuf and colleagues (2002) argued that the oil revenues improve the national economy, which has a positive impact on the country's healthcare services. According to a report from the Ministry of Health (MOH) (MOH 2007), healthcare expenditure is expected to increase dramatically, outstripping the rate of population growth. The demand for hospital beds is predicted to increase from 51,000 to 70,000 (MOH 2007; Khaliq 2012). For example, the Saudi government has increased the healthcare budget by 7.2% between 1999 and 2005. The KSA spent $13 billion on healthcare in 2005, and this spending is expected to increase to over $20 billion by 2016 (Barrage et al. 2007). The oil wealth stimulated the Saudi government's expenditure on improvement of its services' infrastructure, including healthcare services; a decision which inevitably increased demands for skilled healthcare workers (Maben et al. 2010). Mahdi (2007) claimed that the oil booms that are taking place in country, combined with the implementation of related ambitious developmental projects in healthcare, require a huge number of additional healthcare professionals. However, the KSA has encountered, and is therefore suffering from, a severe shortage of those much needed professionals, especially nurses (Almalki et al. 2011; Mahdi 2007). It has been predicted that the next 20 years will constitute the most challenges to the Saudi healthcare services. For instance, by 2020, the number of hospital beds will have increased by 93% and the number of nurses needed will increase by 85% (Schieber 2001; Almalki et al. 2011). Although nursing in the KSA has witnessed notable developments in both education and practice, the rate of Saudi nurses who successfully graduate from their professional education courses is insufficient to meet the nation's predicted increasing healthcare demands. For example, Aldossary and colleagues (2008) found that Saudi nurses make up only 22% of the total of healthcare professionals in the public health sector and 4.1% in the private health sector; distributions which cannot be compatible with the needs of the country's healthcare services (MOH 2008; Almalki et al. 2011). Consequently, the Saudi government adopted a policy of importing international healthcare professionals, including nurses, to fulfil the demands for health development projects in both the public and private sectors. As a result of this problem with home-based supply, the majority of the Saudi nursing workforce is made up of international nurses (Almalki et al. 2011; Aldossary et al. 2008; Tumulty 2001).

1.3 The nursing shortage problem

In general, nursing is experiencing a severe global shortage of registered personnel (Oulton 2006). The KSA, like many other countries, is no exception in that it too is suffering from such a nursing shortage (Almalki et al. 2011). Hence, many developed countries have created strategies, designed to overcome this staff shortage problem (Habermann & Stagge 2010). For example, in the United States, Spetz and Given (2003) reported that the US is faced with a severe shortage of registered nurses. Specifically, Polsky and colleagues (2007), stated that in 2000 the number of international nurses in the US was 181,000, representing 9.1% of the total number of the registered nurses working there; this figure can be compared to the 6.5 % of immigrant nurses, as a percentage of the total number of registered nurses working in the US in 1990 (approximately a 50% increase in a decade). Polsky et al. (2007) argued that the nursing shortage in the US would be about 808,000 by 2020 (Bieski 2007). As a result of this somewhat alarming prediction, the US government is working to recruit international nurses from all over world, in order to fill the gap caused by the local nurses' shortages (Spetz & Given 2003). Similarly, in the United Kingdom (UK), the National Health Service (NHS) is recruiting international nurses, mainly from countries in Africa and Asia in order to overcome the dearth of UK nurses. Nurses recruited from overseas are now said to make up 50% of the total nursing workforce in the UK (Ross et al. 2005). According to Chikanda (2005), in 2002 the total number of international nurses who were recruited was higher than the total number of the new nursing graduates produced by the UK nursing schools (Alonso-Garbayo & Maben 2009).

With regard to a nursing shortage in the KSA, several Saudi studies have shown that low levels of enrolment in the nursing profession among Saudi high school students, as well as a generally poor image of nursing as a vocation, are the most significant factors that are blamed for the nation’s current nursing shortage (Al-Ahmadi 2002; Al-Omar 2004). Aldossary and colleagues (2008) argued that the country has suffered from a severe nursing shortage, mainly caused by the low enrolment levels of Saudi students into nursing education. Their research suggests that, at the current rate of graduation, the Saudi government would require 25 years to prepare a sufficient number of Saudi nurses to meet 30% of the needs of the Saudi healthcare service, using Saudi nurses alone. They also

found that the KSA presently relies heavily on international nurses who are mainly recruited from India, the Philippines, Malaysia, South Africa, the United Kingdom, the United States of America and Australia.

An example of the reliance on international nurses can be seen with the situation in the Prince Sultan Military Medical City (PSMMC), which is one of the largest tertiary care facilities in the Riyadh region of the KSA. The PSMMC has a current capacity of 1500 beds, but it will expand to 3500 beds within five years. The PSMMC provides high quality primary, secondary, tertiary and quaternary healthcare services for Saudi Arabian military employees and their dependents (PSMMC 2010). The hospital is a multi-specialty facility: specialties include medicine, surgery, endoscopy unit, operation rooms, neuro-surgical, orthopaedics, plastic surgery/burns, paediatrics, obstetrics/gynaecology, ear, nose and throat surgery, ophthalmology, oral surgery, intensive care and cardiac care (PSMMC 2009). As a result of the shortage of Saudi nurses, 90% of the qualified registered nurses currently working in PSMMC are non-Saudi in origin. A figure for the number of registered nurses is approximately 4200 in total, with different cultural backgrounds and specialities (PSMMC 2009). The nursing workforce at the PSMMC consists largely of international professionals, who are mainly recruited from India, the Philippines, Malaysia, South Africa, the United Kingdom, the United States, Australia and the Middle East (PSMMC 2006).

Generally, poor induction programmes are correlated with high staff turnover and poor nursing retention, which in turn influences the quality of nursing care and exacerbates the nursing shortage (Gough et al. 2010). At PSMMC it is essential that all new nurses receive adequate induction programmes directed by the Continuing Professional Development department, which is well placed to support and facilitate new nursing staff, as well as current nurses. For instance, Nursing Administration provides intensive orientation and training programmes for new nurses, including nursing competency exams. Successful staff will remain under supervision for three months before working unsupervised with patients, in order to ensure patient safety and the quality of nursing care. In addition, passing the nursing competency exams, and attending study days and other sessions of nursing development, are annual mandatory requirements in order for all nurses to have their contracts renewed within PSMMC (PSMMC 2009).

Many studies have shown that low levels of Saudi student enrolment in nursing education are likely to exacerbate the shortage of Saudi nurses. For example, Al-Omar (2004) found that nursing education was not a favoured career choice among Saudi high school students, because of their negative perceptions of a nursing career. These were related to long working hours and the heavy work-load associated with nursing duties, and it was found that responses on the intention dimension indicated that approximately 32% of students intended to study nursing, while 50.5% did not intend to do so.

Although nursing in the KSA has seen notable developments in both education and practice, the KSA is still facing a chronic shortage of Saudi nurses (Tumulty 2001). Almalki, FitzGerald, and Clark (2011) stated that the latest figures for the Saudi nursing workforce show that only 3% have a bachelor's degree from a college, university or private education institution (Aldossary et al. 2008). Statistics from the MOH show that Saudi nurses make up only 29.1% of the nurses working in all health sectors in the KSA, which cannot be compatible with the needs of the country's healthcare services (MOH 2008; Almalki et al. 2011). In addition, Tumulty (2001) argued that the nursing profession in Saudi Arabia is undesirable, due to onerous nursing duties, long working hours and relatively low incomes. Therefore, negative attitudes about nursing may discourage many capable prospective nurses, causing them to turn to other careers that have better reputations and more attractive prospects (Ellis & Hartley 1995).

Regarding nursing in the KSA, Hoke (2006) found a poor image of nursing as a career among the perceptions of young high school students, which led to their low interest in enrolment into nursing education. This negative image, together with the factors relating to it, are significant contributors to the KSA's widespread nursing shortage, and might explain why nursing has been viewed as an unattractive career choice (Takase et al. 2006; Jackson & Gary 1991). In addition, a study carried out by Mansour (1992) investigated the views of 43 students in the KSA from colleges of medicine, dentistry and pharmacy, as well as 34 of their parents. The author found that both positive and negative perceptions of nursing were held by the respondents, but the negative perceptions outweighed the positive ones. The negative responses were, to a certain extent, similar to those described by Tumulty (2001), including the perception that nurses' roles were

restricted to giving medication and caring for patients, in contrast to the view that nurses are involved in administration, education or research. Nurses were also seen as performing hard work, being unable to make decisions, and as only being responsible for carrying out doctors' orders. For these reasons, a high percentage of nurses working in Saudi hospitals are members of an international nursing workforce; with each member bringing different aspects of his or her cultural background (Jackson & Gary 1991; Al-Omar 2004). This inevitably creates an environment of cultural diversity in the nursing workplace, which can adversely affect the quality of nursing care and patient safety (Mattson 2009; Almutairi et al. 2012). Nurses of diverse cultural and social backgrounds bring a variety of past life and learning experiences to the nursing practice located, as of necessity, in a multicultural setting. Marrone (1999) suggested that certain deficits occasionally emerge because of differing cultural and social backgrounds and language barriers. Such variations provide unique challenges for nursing managers who are required to design systems that structure and support multicultural nursing work environments, to ensure that standards of patient care and standards of nursing performance are achieved (Marrone 1999; Mattson 2009).

According to Paul (2009), the 'multicultural nursing workforce' refers to registered nurses with different cultural norms, beliefs, behaviours, knowledge, customs and skills from the country in which they are working. In general, international nurses who come from different backgrounds comprise a multicultural workforce in many countries; the degree of dependence on the international nurses varies from one country to another. In the KSA, the multicultural nursing workforces are mainly staffed by personnel from different cultural and educational backgrounds who have been recruited from all over the world (Aldossary et al. 2008). However, nurses in this multicultural workplace face constraints in terms of cultures and backgrounds, which often adversely influence their clinical ability in providing quality nursing care and patient safety (Almutairi et al. 2012; Almutairi & McCarthy 2012). Due to increased demand for qualified nurses from abroad, the challenge of adaptation to rules, policies and customs in such a culturally diverse nursing workplace has many different consequences. Bozionelos (2009) found evidence of difficulties in adaptation among non-Saudi professional nurses in a multicultural environment, and identified the relevance of the influence of nurses' attitudes and behavioural

intentions upon their overall nursing performance. Furthermore, Almutairi and McCarthy (2012) argued that a dependency on international nurses might lead to serious cultural problems that affect nurses' compliance regarding nursing policies and procedures (Mattson 2009; Aboul-Enein 2002). Ely and Thomas (2001) found that professional nurses in a multicultural workplace, can experience social pressure, and they usually prefer not to adapt to their work environment, choosing instead to retain their long established cultural values (Troy et al. 2007). It has been shown that negative attitudes, beliefs, changes of management and resource limitations are the biggest factors that have a detrimental effect on nurses' compliance (Ploeg et al. 2007; Hunt 2007).

In addition, a qualitative study explored the experiences of South African nurses who had worked in the KSA. Van Rooyen and colleagues (2010) found that 'foreign' South African nurses experienced difficulties in complying with policies in the multicultural nursing workplace. In contrast, in a research workshop that encouraged compliance with policies and targeted 25 international nurses, Hunt (2007) found that the commitment to comply with policies in a multicultural nursing workforce is dependent on attitudes and behaviours which are consistent with the norms of an inclusive society. Despite these different attitudes and behaviours, Hunt (2004) and Snow (2006) suggest that in order to promote improved nursing care performance, a multicultural nursing workplace should embody an intrinsic motivation and willingness to change attitudes and behaviours.

1.4 The concept of compliance

The term compliance in relation to policies and procedures, together with the frequency and degree to which it occurs, is a vital issue in the healthcare field. There is a pressing need for a conceptual framework of compliance that can guide research and clinical practice, especially in nursing. The lack of a generally accepted definition and framework of compliance makes it difficult to compare the outcomes of compliance research and to assess nurses' compliance with clinical guidelines (Kyngas et al. 2000). Therefore, research attempting to understand the relationship between compliance and nurses' intentions is highly

relevant (Efstathiou et al. 2011). A closely related concept to compliance is adherence. There is a debate regarding whether nurses following nursing policies and procedures should be considered to be exhibiting compliance or adherence, or whether this question is merely an example of a semantic game (Evangelista 1999). Fawcett (1995) suggested that the terminology used to describe such behaviour has changed from that of compliance to preference for term 'adherence' (Playle & Keeley 1998). Basically, several healthcare studies have argued that the terms *compliance* and *adherence* are interchangeable within the literature, although their different meaning and implications have prompted authors to put forward differing interpretations of these two concepts (Safian 2009; Pittet et al. 2000; Ferguson et al. 2004; Leslein 2010). For instance, the term 'adherence' is frequently used with patients who are required to follow a therapeutic regimen (i.e. treatment), while the term 'compliance' is commonly utilised across all healthcare professionals including nurses when it comes to doing what clinical guidelines expect (Delamater 2006; Murphy & Canales 2001; Kyngas et al. 2000; Carpenter 2005; Ingram 2009). Falk (2001) reported that compliance is originally a military term with paternalistic associations of obedience, with the blame for non-compliance placed solely on the individual (Cole 2008).

Traditional compliance literature determines compliance as multidimensional, complex and difficult to define (Russell et al. 2003). According to Haynes and colleagues (1979), compliance behaviour may be defined as the degree of constancy and accuracy with which a person or persons, in this case member of an international nursing workforce, follows a given policy. For example, this may relate to following or implementing nursing policies in accordance with nursing policy instructions or hospital guidelines. Delamater (2006) argued that compliance behaviour may be perceived as the extent to which a nurse's behaviour coincides with nursing policy and procedures. The concept of compliance is echoed by Kyngas et al (2000), who debated the dynamic and transactional components of compliance that include value, motivation and expectations; along with the cognitive and contextual factors that cannot be discarded when examining an individual's behaviour (Cole 2008). Consequently, healthcare professionals, including nurses, need to understand that compliance is only one part of an individual's life; similarly nursing policy compliance needs to be recognised as being only one part of a nurse's 'clinical life' (Cole 2008).

Adherence was defined from different perspectives than with compliance, such as the extent to which a nurse's actions or behaviour coincides with nursing policy or instructions (Christensen 2004); a collaboration to achieve mutually derived goals (Rose et al. 2000), and the extent to which nurses follow instructions (Haynes et al. 2005). However, whilst these statements may initially appear straightforward, the concept of 'extent' is complex. Does a two second hand wash in cold water without soap comply? Does a wash without soap, but in hot water for twenty seconds comply? And what if the hospital policy sets out every parameter in detail? Would a nurse show non-compliance, or merely *less* compliance, if a required thirty second hand wash only lasted twenty-five seconds? Or, put another way, at what point, if any, in this range of hypothetical behaviour, could it be said that compliance had occurred? Indeed, Bissonnette (2008) argued that the definition of the concept of adherence across healthcare providers is vague and ambiguous (Farmer 1999; Bissell et al. 2004; Simpson et al. 2006; Vermeire et al. 2001).

The terms *compliance* and *adherence* in healthcare providers are most frequently considered as synonymous and are used interchangeably (Bissonnette 2008; Haynes et al. 2005; Kontz 1989, Roter et al. 1998). Although it has been suggested that compliance and adherence referred to two aspects of one process (Bissonnette 2008), these terms have been viewed as distinct concepts describing one phenomenon (Bissell et al. 2004). In this thesis, the concept of compliance is used; mainly because, in this study, compliance pertains to the level, frequency and degree to which a nurse follows nursing policy and procedure within a multicultural nursing workforce in the KSA.

Compliant behaviour can be influenced by different factors such as culture, economic, social issues, personality, self-efficacy and lack of knowledge concerning the nature and incidence of non-compliance. This current research focuses on the intentions to comply with hospital policy and procedures among the members of a multicultural nursing workforce. These factors can play an important role in hindering compliance practice. Non-compliance essentially means that incompetence or ignorance prevent a nurse from following the guidelines of nursing policy in the hospital; or worse, is the result of wilful or deviant behaviour (Safian 2009). According to Creedon (2005) compliant

behaviour is, in this current study, dependent on factors that predispose (i.e. attitudes, beliefs and knowledge) and reinforce (i.e. feedback) members of a nursing workforce to engage in complying with their hospital's nursing policy and procedure (Pittet et al. 1999; Leventhal & Cameron 1987). Non-compliant behaviour has been differentiated as either intentional or unintentional. Intentional non-compliance has been stated as deliberate, knowledgeable or intelligent and refers to purposeful alternations of nursing policies and procedures (Horne et al. 2005; Kyngas et al. 2000; Kyngas 1999; Knight et al. 1991). Unintentional non-compliance is considered to be a result of nurse confusion, forgetfulness or ignorance (Wroe 2002; Isaac et al. 1993; Horne et al. 2005). In particular, intentional non-compliance involves an active decision not to comply with the prescribed policies and procedures; a decision which arises from the beliefs, attitudes and expectations that influence nurses' motivation and behaviour (Wroe 2002; Horne et al. 2005). On the other hand, unintentional compliance is less strongly associated with individual's beliefs and cognitions and more strongly with clinical variables (Wroe 2002; Carpenter 2005; Kyngas et al. 2000; Vermeire et al. 2001; Efstathiou et al. 2011; Horne et al. 2005). Non-compliance with policies and procedures is discussed in the next section.

1.5 Non-compliance with policies and procedures

The idea of compliance with nursing policies is a common theme in the nursing literature. Nursing policies and procedures provide structure and standards, so that nurses can offer safe, cost-effective, high quality patient care by their using the best nursing practices (Popovich 2004). Setting out policies and procedures is an established approach that enables healthcare organisations to operate safely, enhancing the quality of patient care and promoting evidence-based nursing practice; with the obvious proviso that medical personnel actually adhere to those rules (Popovich 2004). In order to ensure patient safety and medical best practice, as well as improving quality measurement by providing a benchmark, policies and procedures are commonly used in Saudi hospitals to organise, regulate, facilitate and standardise clinical practice and patient care (Robertson et al. 2006). However, evidence indicates that although, in general, nurses are increasingly compliant with policies and procedures put in place to provide safe and high

quality patient care, there is also a widespread variance in nurses' compliance with such regulations (Puffer & Rashidian 2004; Creedon 2005).

Although nurses' compliance with policies and procedures is a cornerstone of patient safety and high quality healthcare, the rate of such compliance has been shown in various studies to be unacceptably low (Whitby et al. 2006; Bischoff et al. 2000; Creedon 2005, 2006; Wandel et al. 2010; Alsubaie et al. 2012; Basurrah & Madani 2006; Lau et al. 2010). Seventy-two studies have shown that clinical-related behaviour is indicative of the intentions of nurses to comply with policies. Godin and colleagues (2008) found that behaviour surrounding clinical practice is significantly related to the intentions of nurses to comply with policies, thereby contributing to the determining factors that influence nurses' intentions towards compliance.

Despite the fact that there are a great many nursing policies and procedures, one specific area where compliance with policy appears to be very important is pre-operative skin preparation. This specific aspect of nursing performance has been selected as the theme for this study, and to be a representative of other nursing policies. Non-compliance with policies in the area of pre-operative skin preparation increases mortality and morbidity; the latter prolonging the length of hospital stay, causing financial problems, raising issues of unethical performance and increasing the risk of infection (Borgey et al. 2012; Nichols 2004; El Sayed et al. 2008; JBI 2003; Parks 2007; Segal 2006; Webster & Osborne 2006; Raja`a et al. 2002; Dizer et al. 2009; Farr 2000; Manian & Ponzillo 2007; Montecalvo et al. 2001; Hopper & Moss 2010; Small 1996; Seal & Pual-Cheadle 2004). However, the lack of compliance with the pre-operative skin preparation policy among the nursing workforce is strongly associated with an increased risk of infection (Kjonniksen et al. 2002; Dizer et al. 2009; Osborne 2003; Farr 2000; Manian & Ponzillo 2007; Montecalvo et al. 2001).

In addition, several studies have focused on the factors that contribute to non-compliance with pre-operative skin preparation policies. In these studies, non-compliance with nursing policy was suggested to be a direct consequence of various factors, such as the chronic nursing shortage, heavy workloads, lack of medical or other knowledge, lack of experience, poor or inadequate time

management, training deficits, a negative influence of equipment on nursing skills (i.e. gloves), low salary, poor decision making skills, ineffective critical thinking and a lack of understanding of appropriate clinical techniques. It has been suggested that all of these variables contribute, in different ways, to detrimental effects on nursing practice outcomes and patient safety (Van Rooyen et al. 2010; Downs 2010; Martín-Madrazo et al. 2009; Efstathiou et al. 2011; Creedon 2005; Squires et al. 2007; Hughes 2008; Bally 2007; Hopper & Moss 2010; Small 1996; Seal & Pual-Cheadle 2004). A study of non-compliance with a hospital's hand hygiene policy was carried out in a University of Geneva hospital; the study being based on identified behavioural factors associated with beliefs, attitudes and perceptions in non-compliance with hand hygiene. The results showed that 75% of participants believed that the hospital's hand hygiene policy contributed to a high risk of cross transmission (Pittet et al. 2004). Consequently, nurses' behaviour, beliefs, attitudes and perceptions all contributed to their non-compliance with the policy (Fishbein & Ajzen 1975; Pittet et al. 1999, 2000; Godin et al. 2000; Nystrom 1994; Martín-Madrazo et al. 2009; Pielak et al. 2010).

Although a relatively inexperienced researcher, I have been highly motivated and supported by the PSMMC to undertake this research through the postgraduate programme in the University of Southampton (i.e. DClinP), and have brought specific skills and knowledge from the KSA that would improve the quality of nursing care and patient safety. The initial idea for this research originated from my role as the Assistant Director of Nursing and the Chair of the Investigation Committee in the Nursing Department at PSMMC; my experience in these roles has presented me with many challenges during clinical investigations. I recognised that the majority of incidents would not have occurred if nurses had complied effectively with the policy governing pre-operative skin preparation. However, the investigation reports often found that nurses in adult medical surgical units either had not complied with this policy, or else a lack of experience, critical thinking and decision making may have interfered with their performance. For example, I observed that many surgical procedures were cancelled due to failure in performing pre-operative skin preparation practices and the patients had not been prepared appropriately. In addition, other cases of poor preparation or using non-sterile techniques were considered to have contributed to the development of surgical infections.

1.6 Theoretical framework of the study

Clinical behaviour and attitudes among the nursing workforce affect compliance with policies and procedures, with empirical results indicating that positive attitudes, behavioural norms, and the belief that one is a role model, are all strongly associated with compliance to guidance (Fishbein & Ajzen 1975; Pittet et al. 2004; Jenner et al. 2002). These underlying factors, which many researchers strongly suggest affect medical professionals' compliance behaviour, need to be understood. Johnson (2003) argued that psychological theories have been widely used to improve an understanding of factors that explain and predict behavioural intentions to engage in positive conforming health behaviour (Ajzen 1991; Armitage & Conner 2001). However, there have been no studies which have investigated compliance with nursing policies in the KSA: the current lack of understanding of variations in practice nurses' compliance behaviour may negatively impact upon the quality of the healthcare being offered. Therefore, it is necessary to explore ways to understand the factors related to nurses' behaviour, and their intention to comply with policies when working in the KSA, in order to design interventions that can ensure safe and high quality patient care.

It has been observed that, to date, there have been few behavioural studies of intention and behaviour among healthcare professionals worldwide, which indicates that an investigation of the determining factors of behavioural intentions, and the factors which may enhance prediction of behaviour, will be worthwhile (Godin et al. 2008). Several models and theories have been created to explain and predict medical professionals' health-related behaviour. These models include the Health Belief Model (HBM) (Rosenstock 1974), Social Cognitive Theory (SCT) (Bandura 1986), the Theory of Reasoned Action (TRA) (Ajzen & Fishbein 1980) and the Theory of Planned Behaviour (TPB) (Ajzen 1985). Among these psychological theories, the TPB is the most used theoretical framework that has been categorised prominently in the compliance setting (Ajzen 1991; Taylor et al. 2007; Ko et al. 2011; O'Boyle et al. 2001; Jenner et al. 2002; Puffer & Rashidian 2004). This theory is used to illustrate the nurses' tendencies to carry out appropriate or required compliance behaviour. According to Ajzen (1991), nurses' behavioural intentions are the most proximal determinants of their

behaviour, which is influenced by three psychosocial factors. These factors are: a) attitudes towards a specific behaviour (the positive or negative perception to carry out the compliance behaviour); b) subjective norms (the perception of pressure from important people influencing whether they should or should not carry out the compliance behaviour) and c) perceived behavioural control (PBC) (the perceptions regarding factors that prevent or enable an individual to carry out the expected compliance behaviour) (Ajzen 1991). The TPB also asserts that nurses' behavioural, normative and control beliefs are related to the performance of compliance behaviour, via the roles of attitudes, subjective norms and PBC (Ajzen 1991).

Furthermore, the TPB (1985) is a helpful and highly significant psychological framework that has been frequently utilised to gain a richer understanding of the extent to which nurses' attitudes, subjective norms and PBC can influence their behavioural intentions to comply with nursing policy (Ajzen 1991). The study findings may inspire nursing leaders to develop strategic interventions with a view to creating a more supportive work environment for nurses, in order to ensure provision of the desired quality and safety of nursing care. More specifically, in this study the roles of attitudes, subjective norms and PBC factors relating to the nurses' behavioural intentions to comply with hospital nursing policies, were examined by using the TPB as the general theoretical framework (Ajzen 1991).

1.7 Conclusion and dissertation structure

In summary, the nursing shortage in the KSA causes administrative difficulties and increases concerns about the quality of available healthcare, as well as contributing to a highly multicultural nursing workforce (Almalki et al. 2011). Nursing compliance with policies and procedures is important to ensure the underlying safety and quality of patient healthcare. However, it is suggested by several researchers that compliance with policies among healthcare professionals, including nurses, is still at an unacceptably low level (Bischoff et al. 2000; Wandel et al. 2010; Basurrah & Madani 2006; Lau et al. 2010). By using the tenets of the

TPB, this study will attempt to identify the determinants that influence nurses' behavioural intentions to carry out the required compliance behaviour in the KSA.

This dissertation has five chapters. This chapter (chapter one) presents the background of the current research. It briefly explains nurse-based challenges to healthcare services in the KSA, the problem of KSA's nursing shortage and concerns over the issue of the compliance performance with nursing policies and procedures. Chapter one also provides an overview of the popular psychological theoretical framework (i.e. the TPB) that underpins this study.

Chapter two discusses and presents the research strategy chosen for this study. This chapter provides a comprehensive review of the literature pertaining to important psychological theories, and then illustrates and argues why it was seen that the TPB model appears the most appropriate theoretical framework for use in this research. The chapter concludes with an articulation of the study's aims, objectives and research question.

Chapter three presents the methodology of the study. It discusses the approach taken and details each phase in the research design, selecting the participants, collecting and analysing the data. The purpose of the first phase (i.e. elicitation study) is to elicit model salient behavioural, normative and control beliefs regarding compliance with the pre-operative skin preparation policy among a multicultural nursing workforce. Using the guidelines of the TPB, six modified open-ended questions asked the participants about the advantages and disadvantages of compliance with the pre-operative skin preparation policy; people who may approve of compliance; people who may disapprove; factors that make it easy to comply; and factors that make it difficult. Within the chapter the method of the first phase study, including the pilot study, ethical considerations, data collection and analysis, and the results are all discussed.

The fourth chapter presents methods involved in the second phase study, which deals with the quantitative data in three sections. The first section deals with the

rationale for the research design; the second considers the questionnaire development related to the TPB constructs. In the third section, the pilot study, reliability of measures, data analysis strategies and findings of the statistical tests which were applied to test the research hypotheses, are presented. This chapter describes the results of the influence of TPB constructs on nurses' behavioural intentions to carry out the compliance with the hospital's pre-operative skin preparation policy.

Chapter five presents the discussion of the results obtained from all studies in relation to guidelines of the TPB model and contemporary research. This chapter summarises the conclusions, limitations of the study and recommendations for future research. Finally, the implications of the study's findings for nursing practice in the KSA are presented.

Chapter 2: Literature review

2.1 Introduction

This chapter provides an overview of literature relevant to the research topic outlined in chapter one. This literature review begins with a discussion of the search strategy. The literature presents a brief overview of the concept of psychological models that aim for an understanding of cognition that is believed to be useful in explaining and predicting clinical practice behaviour (Conner & Norman 2005).

Evidence suggests there is a range of behavioural models and theories that can be useful in explaining and predicting clinical conduct, by examining the psychosocial determinants of nurses' compliance behaviour. These psychological theories can guide health professionals in their attempts to design effective interventions necessary to ensure safe and high quality patient care (Godin et al. 2008; Grimshaw et al. 2001; Grol et al. 2007). This literature review presents a brief synopsis of the behavioural theories of intentional behaviour that constitute a popular conceptual framework that can assist in gaining an understanding of nurses' compliance behaviour. The review also addresses the need to identify which psychological factors influence the expatriate nurses' intentions towards carrying out compliance (Armitage & Conner 2000; Taylor et al. 2007). Therefore, certain psychological theories that are believed to be useful in explaining and predicting compliance behaviour will be reviewed (Conner & Norman 2005; Ajzen 1991; Godin et al. 2008; Puffer & Rashidian 2004). These theories include the Health Belief Model (HBM) (Rosenstock 1974); Social Cognitive Theory (SCT) (Bandura, 1986); the Theory of Reasoned Action (TRA) (Ajzen & Fishbein 1980); and the Theory of Planned Behaviour (TPB) (Ajzen 1985, 1991).

A brief description of the aforementioned theories, including a critique and the limitations of each model, will be presented. In addition, a detailed analysis of the TPB, and its origin in the TRA, will be presented, based on reviews, previously conducted studies that applied Ajzen's (1991) model as a theoretical framework. Such an analysis is intended to provide further insights regarding the TPB model.

Finally, a number of relevant studies, including meta-analytic reviews, are considered and discussed in order to justify the researcher's selection of the theoretical approach used in this study.

2.2 Data sources and search strategy

There are several types of electronic database available for those persons investigating specific fields or disciplines. This literature review began by searching and selecting the electronic databases for relevant nursing and healthcare studies. The resources accessed for data collection included books, dissertations and online databases, including the Cumulative Index of Nursing and Allied Health Literature (CINAHL), Medical Literature On-Line (PubMed or Medline), Psychology Information (PsycINFO), OvidSP. Other databases involved were the Web of Science database and Google Scholar, both of which offer scholarly literature from different fields, including nursing and health (Cronin et al. 2008) (Table 2.1).

Table 2.1: The accessed electronic databases

CINAHL	Cumulative Index to Nursing and Allied Health Literature, providing authoritative coverage of literature related to these subjects. Part of the Ovid online service and accessed by using the University of Southampton's computer network
PubMed	The Medical Literature On-Line is the most extensive international healthcare database, containing the US National Library of Medicine and additional life science journals. Part of the Ovid online service and accessed by using the University's computer network.
PsycINFO	International literature in psychology and related fields. It is a useful source for nursing psychology information and mental health nursing. It was accessed by using the University of Southampton's computer network.

OvidSP	A specialist search tool containing a number of databases with advanced search that allows researchers to access a wide range of healthcare studies and social science journals, including nursing and evidence-based practice. This is achieved through a comprehensive search of published literature across different professional fields. OvidSP is part of the Ovid online service and was accessed via the University's computer network.

The search strategies included identifying appropriate keywords and then making links between them. The keywords used in the literature searches were: the Theory of Planned Behaviour (TPB), nursing, intention, belief, attitude, subjective norm, perceived behavioural control (PBC) and compliance. In addition, the inclusion and exclusion criteria in the search for resources, and their refinement, included all qualitative and quantitative studies; no restrictions were placed on the study design (see Table 2.2). The search was focused on the relevant studies published between the years 1990 to 2012, which considered all reviewed information remain valid and up to date with topic of the research study.

Table 2.2: The inclusion and exclusion criteria of studies

The inclusion criteria	The exclusion criteria
• The time frame of the published articles should be contemporary. All articles published between January 1st 1990 and January 1st 2012 were included. • The language of published articles was English. • Articles that included any of the identified key words. • Articles that used the TPB as a theoretical framework in the health science domain.	• Articles published before January 1st 1990. • Articles published in a language other than English. • Articles investigating non-humans. • Articles that were not published in peer-reviewed journals.

Initially, 7861 studies were identified. The search was then refined by including additional search terms that reduced the number of articles to 256. The search strategy used each word separately, and then used a combination of Boolean

operators including 'AND' to combine two or more terms, 'OR' to ensure that at least one of the terms was present in the result, and 'NOT'to exclude records with certain terms from the results. The search strategy also shows that many electronic databases recognise the truncation symbol (*) at the end of a term in the search process, in order to expand the search to include all forms of the root word. Only the PsycINFO database retrieved an article that included all the key words. All the articles that were retrieved, based on the key words, were reviewed. The most significant and relevant articles were selected (see Appendix A). For the literature selected by the search, the titles, abstracts and entire articles were retrieved from the databases. The title and abstract of each retrieved article was reviewed to identify the most relevant pieces of research on the topic. The most relevant articles used the TPB as a theoretical framework to explain individuals' intentions to perform specific behaviours. Some articles were excluded due to duplication, irrelevance and non-matching with the inclusion criteria, thereby reducing the number of articles to 89. These papers and other publications were identified as being relevant to the purpose of this study (Figure 2.1). The references lists of the retrieved articles were manually searched and seven articles were identified. The results from each database are shown in Appendix A. These were all important databases to search in order to retrieve a wide range of relevant articles for this study (e.g. see Appendix B for the summary of the literature review results).

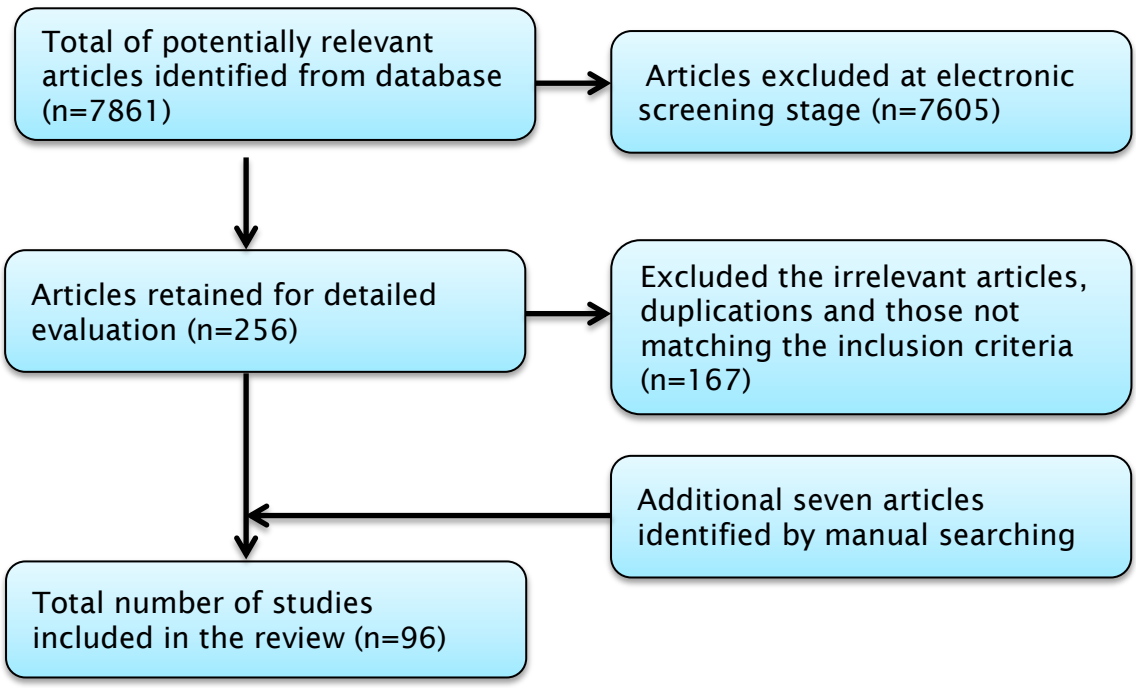


Figure 2.1: The process of search findings from databases

2.3 An overview of psychological models relevant to understanding nurses' behaviour

The use of psychological theory is an important organising framework in understanding cognitive and behavioural responses to health-related issues. Evaluating a set of beliefs, generally held by a particular group of people enables researchers to predict individual behaviour (Godin et al. 2008). This premise is based on the assumption that transmission of shared cultural features, such as beliefs, attitudes and values has a greater impact than the effect of individual activity on cultural practices (Eccles et al. 2007). Michie and colleagues (2005) suggested that the psychological theory has the ability to provide a generalisable underlying framework for studying health-related behaviour, by using psychological theories to explain and predict the clinical practice behaviour of health professionals, including nurses.

There are several factors that can influence the clinical practice behaviour of a nursing workforce, including nurses' motivational predispositions to change, social influences, attitudes, perceptions of control, economic conditions and the workplace environments inside the nurses' hospitals (Efstathiou et al. 2011; Grol & Wensing 2004;Godin et al. 2008). However, an understanding of these factors and optimal approaches to changing nurses' behaviour are still waiting to be discovered (Godin et al. 2008). This has led to the use of psychological theories that guide healthcare professionals in designing interventions necessary to ensure safe and high quality standards of patient care (Grimshaw et al. 2001; Grol et al. 2007). There is a range of behavioural theories existing in the literature that can be, and have been, used to explain health-related behaviours (Godin et al. 2008; Armitage & Conner 2001; Taylor et al. 2007). However, there have been no studies carried out which focus on compliance with nursing policies in the KSA, and the current lack of understanding of variations in practice of nurses' compliance behaviour may negatively impact upon the quality of healthcare being provided to patients in the KSA's hospitals. Consequently, it is arguably of relevance to obtain a better understanding of the nurses' compliance behaviour from psychological theories, in order to improve the quality of both behaviour and behavioural intention in policy compliance among a multicultural nursing workforce in the KSA (Michie et al. 2005; Godin et al. 2008).

Ewart (2004) considered that several psychological theories could be used to explain, examine and understand the determinants of nurses' compliance behaviour (Glanz et al. 2008); behaviour which is highly significant to ensure the underlying safety and quality of patients' healthcare (Lau et al. 2010). Eccles and colleagues (2007) found that using models based on relevant psychological theory offers evidence that supports the exploration of social factors and reasons that may exert influence on a nurse's behavioural intention to adopt clinical behaviour, as well as predicting clinical behaviour among healthcare professionals. Ajzen and Fishbein (1980) strongly argued that psychological behavioural theories would be useful to explain nurses' compliant behaviour, in terms of variables that are amenable to influencing their compliance. More importantly, the theories are employed in order to determine the theoretical constructs that predict nurses' behavioural intentions based on their underlying motives to carry out the desired compliance (Michie et al. 2005; Eccles et al. 2007; Grol et al. 2007).

According to Bandura (2000), psychological theories currently offer the most comprehensive explanation of individuals' behaviours, providing the greatest understanding of how cognitive and social factors influence clinical practice behaviour (Fishbein & Ajzen 1975). Psychological theories examine cognitive processes when used to explain and predict healthcare professionals' behavioural intentions towards carrying out their prescribed clinical practice behaviour (Conner & Norman 2005; Taylor et al. 2007; Maddux 1993; Leventhal & Cameron 1987; Conner & Sparks 2005; Godin et al. 2008). The most frequently used psychological theories to examine behavioural intentions and behaviour across a wide range of health behaviours include the Health Belief Model (HBM) (Rosenstock 1974); Social Cognitive Theory (SCT) (Bandura, 1986); the Theory of Reasoned Action (TRA) (Ajzen & Fishbein 1980) and the TPB (Ajzen 1985, 1991). These theories are discussed below.

2.4 The Health Belief Model (HBM)

The Health Belief Model (HBM) is one of the earliest social cognition models used to explain health behaviour (Sheeran & Abraham 1995). Regarding the HBM,

Rosenstock (1990) argued that the underlying theory was developed by a group of social psychologists in the 1950s. They were trying to explain the failure of individuals to have a chest X-ray for the early detection of tuberculosis; an explanation structured upon the relationship between health beliefs and health-related behaviours (Sheeran & Abraham 1995). The HBM offers a theoretical basis from which health-related behaviour could be predicted and changed. According to Rosenstock (1974, 1990), HBM has its origins in the expectancy-value method. This method predicts behaviour based on two elements: the subjective values of people concerning a specific outcome and their estimate of the likelihood of a specific behaviour associated with that outcome. Consequently, the HBM proposes that people's motivation to prevent an unpleasant health outcome is based on their subjective thoughts towards the outcome and their belief of the probability that a particular action would avoid that negative outcome (Rosenstock 1974, 1990).

Maddux (1993) reported that the HBM model has four of the essential beliefs that impact health behaviour. These beliefs consisted of i) perceived susceptibility including individual's perception regarding risk about the health behaviour; ii) perceived severity of the threat to health behaviour; iii) perceived benefits from the behaviour and iv) perceived barriers towards behaviour. Each of these perceptions, individually, or in combination, can be used to explain health behaviour. In addition, it is suggested that cues to performance are the stimuli triggering the likelihood to take action (Maddux 1993). These cues might be internal (e.g. illness of a family member) or external (television or radio news reports) (Graham et al. 2002).

This model was also used to explain poor compliance with community health programmes, such as immunisation (Maddux 1993). However, the evidence indicates that the theoretical HBM has weak predictive power in most areas of health-related behaviour (Armitage & Conner 2000; Taylor et al. 2007). Psychologically, the HBM does not consider other factors such as cultural, environmental or economic issues that might also have an impact on clinical practice behaviours (Tanner-Smith & Brown 2010; Janz et al. 2002). In addition, Conner and Norman (2005) reported that variables such as intentions to carry out a specific behaviour, and the influence of social pressure, both of which were

found to be highly predictive of behaviour, are omitted from the HBM model (Conner & Sparks 2005).

It has been noticed that the HBM was designed to test factors that predict health enhancing behaviours and is mostly used within the field of health promotion (Taylor et al. 2007). When this model was used in practice, it was focused mainly on the measurement and analyses of susceptibility, severity, benefit and barrier perception beliefs alone; all outcomes which can result from not carrying out the health enhancing behaviour (Crepaz and Marks 2002; Zimmerman & Vernberg 1994; Yarbrough & Braden 2001). Therefore, the HBM is inappropriate for understanding or predicting compliance behaviour, because the compliance behaviour is not actually a health promoting behaviour: nor are the constructs within the HBM (Taylor et al. 2007; Zimmerman & Vernberg 1994). The HBM does not have clear guidelines regarding how variables might be operationalised, especially the components of benefits and barriers (Janz et al. 2002). Moreover, Taylor and colleagues (2007) found that the HBM has insufficient rules regarding combinations of variables and inconsistent application (Yarbrough & Braden 2001; Armitage & Conner 2000). It is reasonable to conclude that the predictive capacity of this model is limited, when compared to other social cognition models (Zimmerman & Vernberg 1994).

2.5 The Social Cognitive Theory (SCT)

In 1986, Bandura published a comprehensive theoretical framework for understanding human social behaviour and human behaviour change (Petosa et al. 2003), which he referred to as his Social Cognitive Theory (SCT) (Bandura 1986). The SCT is used as a theoretical framework for understanding and explaining individual approaches to health behaviour change (Baronowski et al. 2002). This theory includes both the psychosocial dynamics influencing health behaviour and approaches for supporting behavioural change. According to Bandura (1986), the SCT comprises the individuals' capabilities to symbolise the meanings of behaviour, their ability to predict the outcomes of given behaviour patterns, to learn by observing others, as well as to self-regulate behaviour and to reflect and analyse experiences between important personal factors, which can

identify whether or not a specific behaviour may happen in a specific situation (Bandura 1986).

The SCT explains psychosocial functioning in a triadic reciprocal relationship between individuals, their behaviour and their environment, wherein individuals are both impacted by, and active producers of, their surroundings (Bandura 1986). Environmental influences (e.g. social or physical) affect the individual, regardless of his or her behaviour, when thoughts and feelings are modified through modelling or social persuasion (Bandura 1986). Individuals influence the environment by how they interact with that environment; in how they understand their environment and in how they behave inside their environment. In the final reciprocal link between the environment and behaviour, behaviour changes environmental conditions, and it is in turn, changed by the conditions it creates (Bandura 1986). The ways that individuals understand their social and physical environment would influence how they behave within that environment; in turn, their behaviour would reciprocally influence the ways that they understand their social and physical environment (Bandura 1986).

The SCT focuses on the concept of self-efficacy, seen as the belief in an individual's capabilities to recognise and carry out a specific action required to produce given attainments (Bandura 1997). Self-efficacy is a key component of self-reflection, which is essential for changing health behaviour in the SCT model (Bandura 1986). Individual efficacy beliefs are expected to determine action, both directly and indirectly, via their effect on motivation. The belief that actions would produce the desired effect is expected to directly impact behavioural engagement; such belief is also expected to impact behaviour indirectly by regulating motivation (Bandura 1986, 2000).

Bandura (1997) argued that the SCT approach is based on firm scientific data, using self-efficacy to predict people’s behaviour in several health-related areas, such as weight loss, quitting smoking, taking exercise, alcohol use and Acquired Immunodeficiency Syndrome (AIDS) prevention (Weinberg & Gould 2007; Bandura, 2000; Maibach & Murphy 1995). However, the problem with the SCT is that it is a very difficult and dynamic theory which incorporates reciprocal relationships,

making it complex to apply, because it suggests that a change in one construct may lead to a consequent change in every other construct. Moreover, the SCT model suggests that individual and environmental influences might not function as independent determinants (Bandura, 1998). In addition, Redmond (2009) argued that high self-efficacy would sometimes lead to the individual applying less effort to a particular action. This is because high self-efficacy would sometimes lead to overconfidence in an individual's aptitude, thus creating a false sense of ability. For example, individuals might think that they know more, regarding the action, than they do and therefore fail to apply the needed effort (Redmond 2009; Bandura 1998; Maibach & Murphy 1995). The self-efficacy improvement of the nurses involved in this current research had a positive influence on their compliance behaviour. According to Bandura (1997), nurses who have greater self-efficacy are not only more successful but are also better. They are healthier because they are more likely to comply with nursing policies and procedures. In contrast, nurses with a low level of self-efficacy might dedicate less effort and, therefore have a greater tendency to abandon their attempts in carrying out the required compliance behaviour (Bandura 1997).

2.6 The Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) (Ajzen & Fishbein 1980) was first introduced by Ajzen and Fishbein in 1967, in an attempt to understand and explain the relationship between beliefs, attitudes, intentions and behaviour (Fishbein & Ajzen 1975). The TRA is based on the premise that an individual's intention to carry out a given behaviour is the most proximal antecedent of that behaviour. Individuals' intentions are informed by their attitudes toward carrying out the behaviour and the subjective norms relating to behavioural performance (Ajzen & Fishbein 1980; Fishbein & Ajzen 1975).

The TRA indicates that the two determinants of intention are the individual's attitudes toward the behaviour and the subjective norms (Ajzen & Fishbein 1980). Together, these forces determine intent. Ajzen and Fishbein (1980) found that individuals would intend to carry out the behaviour when they evaluate it positively and when they believe the ‘most important people’ think they should

carry out it. Nevertheless, the theory recognises that the relative weights of attitudes and subjective norms differ, based on levels of intent and also they differ from one person to another (Ajzen & Fishbein 1980).

Attitude refers to the individual's overall evaluation of their behaviour, which might be positive or negative (Fishbein & Ajzen 1975). Attitudes are established from a combination of beliefs about behaviours and outcome evaluations (Ajzen 1991). Attitudes have different scales of measurement and may be assessed using bipolar adjectives like harmful or beneficial, favourite or least favourite, good or bad (Ajzen & Fishbein 1980) (Figure 2.2). The purpose of attitude construction is to assess beliefs toward behavioural performance outcomes that can be weighted by the individual's positive or negative evaluations (Ajzen 1991). In addition, the relationship between the strength of behavioural beliefs, and the evaluation of outcomes, depends on an expectancy value model attitude (Feather 1988). Thus, according to the TRA, attitudes will have a significant influence on nurses' intentions (Ajzen 1991).

Subjective norm refers to an individual's perception of others' beliefs (Ajzen & Fishbein 1980). Subjective norms depend on normative beliefs; the significance of people's desire and willingness to raise support from others influences their motivation to comply (Fishbein & Ajzen 1975). Normative beliefs interact with multiple factors to encourage compliance, indicating which people the individual needs to emulate to determine subjective norms. Thus, the more favourably an individual evaluates behaviour, and the stronger the perception of support from others, the stronger the intention will be to do the behaviour, and the more likely a person is to actually engage in that behaviour (Ajzen 1991) (Figure 2.2).

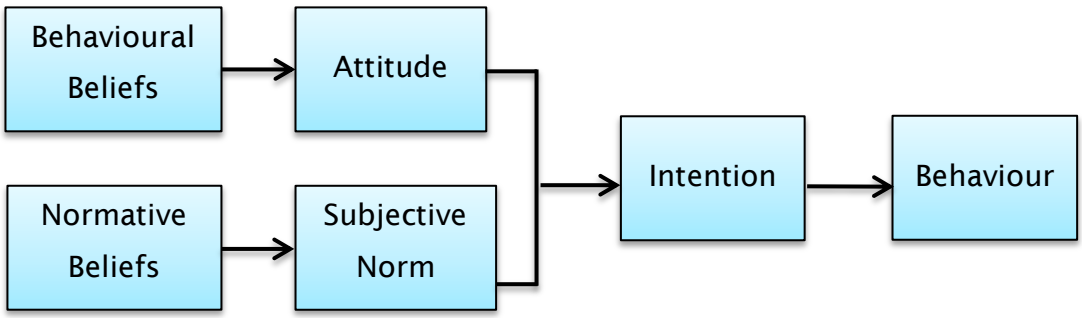


Figure 2.2 Theory of Reasoned Action (adapted from Ajzen and Fishbein 1980)

Using the TRA as a conceptual framework, Ajzen and Fishbein (1980) assumed that attitudes towards behaviour stem from underlying beliefs concerning that behaviour. They stated that the TRA assumes attitudes result from a combination of beliefs regarding the characteristics of a specific attitude object and evaluations of these characteristics. The intent of the individual plays a significant role in this theory, and is considered as the greatest predictor of whether or not the individual would carry out a specific behaviour (Ajzen & Fishbein 1980).

As shown in figure 2.2, the TRA differed from earlier attitude and behavioural prediction theories in that the principle of compatibility was considered when developing variables. The TRA (Ajzen & Fishbein 1980) was formulated in response to low levels of prediction in the relationship between attitude and behaviour. The TRA has explained and predicted behavioural intentions that depend on individual attitudes about behaviour and subjective norms. Overall, Fishbein and Ajzen (1975) argued that the TRA model explains the changes in people's behavioural and normative beliefs, which ultimately impact their actual behaviour. However, the TRA has some limitations regarding the explanation of all mechanisms, in terms of innovation and the role of people's behavioural intent.

Ajzen and Fishbein (1980) stated that attitude is a strong predictor when measured at the same level of generality or specificity as the action. In addition, the researchers did not make reference to other factors often used by social

researchers to explain behaviour. Although Ajzen and Fishbein (1980) identified the significance of these factors, they considered them as external variables. More specifically, other constraints such as low ability, environmental or hospital limits and time may also impact the performance of behaviours, and people cannot control the influence that those constraints apply to their conduct. Overall, behaviours are under complete volitional control only when an individual's actions can be carried out at will, and are not facilitated or prevented by personal (i.e. low ability) and / or environment factors (i.e. time, other customs) (Ajzen & Fishbein 1980; Ajzen 1991, 2002). By definition, volitional control means the individual requires having special skills, resources and support available to perform a particular behaviour (Ajzen 1991).

According to Ajzen and Fishbein (1980), a number of barriers to human behaviours could exist; thus, including these groups of non-volitional variables in the original volitional model is necessary when studying a particular human behaviour. Therefore, Ajzen and Fishbein (1980) suggested that intentions might be less good predictors of behaviour. It was predicted that when a person had volitional control, attitudes would play an important role in predicting behavioural intentions and thus behaviour. However, when the person has low volitional control, the effect of attitude on behavioural intentions would be much less significant in predicting behaviour (Ajzen 1991). This view led to Ajzen's (1985) updated extension of the TRA model, called the TPB, developed in order to explain the mechanisms that illustrate the use of innovation and the role of people's behavioural intent (Ajzen 1991).

2.7 The Theory of Planned Behaviour (TPB)

The TPB is an extension of the TRA proposed by Fishbein and Ajzen (1975). Proponents of TRA sought to understand behaviour by looking at the relationship between attitudes, subjective norms and behavioural intentions. Attitudes and subjective norms were posited as determinants of intention (Ajzen & Fishbein 1980; Ajzen 1991). It was then presumed that intention directly influences behaviour. However, many researchers suggested TRA was insufficient when individuals believed they have little control over their decisions (Ajzen 1991).

Therefore, the TPB emerged, applying the exact same framework as TRA, but with the addition of Perceived Behavioural Control (PBC) as a third determinant of intentions (Ajzen & Driver 1991).

In that regard, the concept of non-volitional factors (i.e. PBC) was added to the TRA to form the TPB; the latter being specifically designed to understand human behaviours under both volitional and non-volitional control (Ajzen 1991). The TPB was developed to assist in predicting behavioural intentions and behaviours, and also to enhance the explanation of uncompleted behaviours that are under individuals' volitional control (Ajzen 1991). The major difference between TRA and TPB is that the TPB model contains PBC: an individual's actual possession of the opportunities and resources required to perform the necessary or desired behaviour (Ajzen 1991; Ajzen & Fishbein 1980). For example, an individual who has a high motivation to carry out the compliance (behaviour) does not actually do so due to adverse environmental conditions, such as the lack of available protective equipment (i.e. gloves). A possible reason for this would be that there are several factors impacting the person's intention, which complicates prediction of behaviour based on the concept of intention (Ajzen 1991).

Psychologically, Ajzen (1991) argued that the TPB model suggests that the determinant of any behaviour is an intention to perform it, which itself is determined by three variables: attitude, subjective norms and PBC towards the behaviour (see Figure 2.3) (Conner & Sparks 2005). The TPB assumes that individuals' intentions predict their behaviour, which is under volitional control (Fishbein & Ajzen, 1975). However, Ajzen (1991) stated that the relative significance of attitudes, subjective norms and PBC in explaining and predicting of behavioural intentions is expected to vary across behaviours and situations. That is, in situations where attitudes are strong, or where normative influences are significant, PBC might be less predictive of behavioural intentions (Armitage & Conner 2001; Glanz et al. 2008).

In addition, the concept of *PBC* offers significant and consistent evidence for a distinction between control beliefs and perceived power, because the concept plays a key role in understanding these notions (Ajzen, 2002). Control beliefs

focus on possibilities that inhibit or simplify the behaviour, and perceived power focuses on psychological constraints that inhibit or simplify the performance of the behaviour (Ajzen 1991). Accordingly, PBC is a significant factor in the prediction of behavioural intentions that reflect actual control (Ajzen 1991, 2002). As illustrated in the theoretical model shown in figure 2.3, the TPB suggests that the concept of PBC can have direct effects on behaviour, as well as indirect effects caused by the mediating influence of behavioural intentions (Ajzen 1991). First, PBC would have a direct influence on behaviour without affecting behavioural intentions, as it is likely that the person's perceived control may be an accurate reflection of the person's actual control over the behaviour (Ajzen 1991). Second, it is assumed that PBC would have an indirect influence on behaviour, which is based on the hypothesis that PBC can motivate intentions, and these would impact the performance of the behaviour (Ajzen 1991).

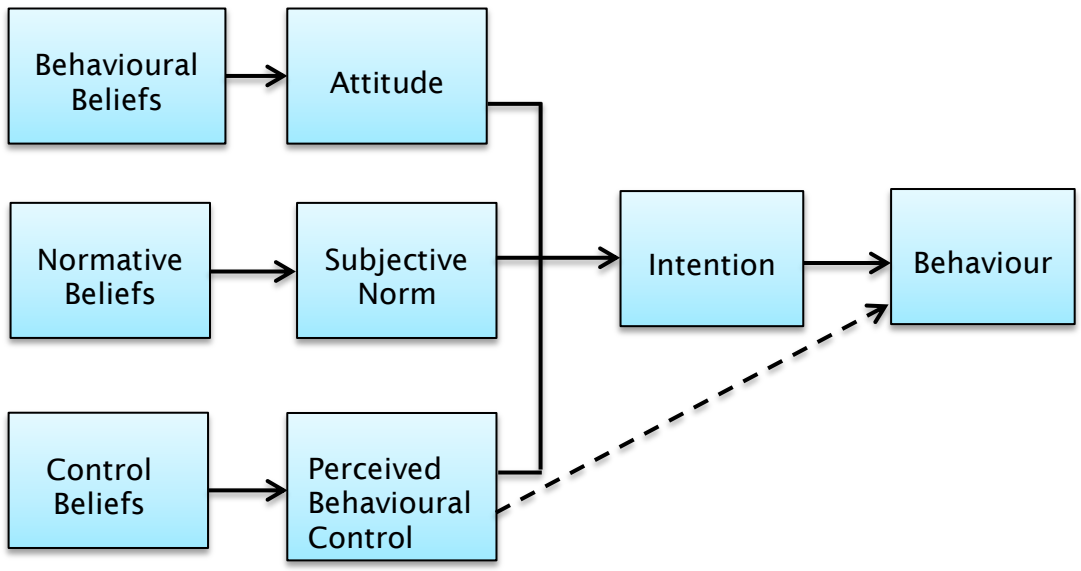


Figure 2.3: Theory of Planned Behaviour (adapted from Ajzen 1991)

PBC is a construct explaining the capability to perform the behaviour (i.e. how easy or difficult the performance of the behaviour is). According to Bandura (1982), PBC is comprised of an internal factor, i.e. the self-efficacy concept, representing the perception of individual capability, and an external factor that represents the perception of control over environmental barriers (Conner & Armitage 1998; Terry & O'Leary 1995). PBC is significant in the prediction of the

relationship between behavioural intentions and actual behaviours, such as smoking (Kovac & Rise 2011), as well as health care professionals' intentions and behaviours (Godin et al. 2008).

Behavioural Intention plays a significant role in predicting behaviour: the concept is based on individuals' attitudes towards demonstrating the behaviour, as well as subjective norms concerning the performance of the behaviour. Most behaviours are not completed under volitional control (Ajzen 1985, 1991). For this reason, PBC is constructed from the "internal cognitive perceptions of control, including perception of personal ability" (e.g."the perceived ease or difficulty of compliance with pre-operative skin preparation practice"), and external control factors, including perceptions of environmental barriers (e.g." perceived constraints, such as a nursing shortage or equipment availability, may contribute to compliance with pre-operative skin preparation performance") (Ajzen 2002; Conner & Armitage 1998; Spark et al. 1997).

In general, the TPB variables (attitude towards the behaviour, subjective norms, and PBC) determine the influence of the behavioural intention that leads individuals to perform the actual behaviour or not to perform that behaviour (Figure 2.3). For instance, an individual with a positive behaviour evaluation, the belief that others have significant intentions to perform the behaviour, and perceived control over implementing the behaviour themselves, will have a strong behavioural intention to perform that behaviour (Ajzen 2002; Conner & McMillan 1999). In other words, the compliance with pre-operative skin preparation policy could be explained and predicted by whether or not a particular nurse is favourable to carrying out the compliance, whether or not the nurse feels socially pressured to carry out the compliance and whether or not the nurse feels in control of carrying out the compliance (Fishbein & Ajzen 1975). Therefore, Ajzen's TPB model (1985) was adopted to explain and understand the psychosocial determinants that contribute to influence the intentions of members of the multicultural nursing workforce to carry out compliance with the pre-operative skin preparation policy (Ajzen 1991).

2.8 An overview of previous research involving general applications of the TPB model

There is evidence to show that the TPB is a useful theoretical framework, by offering support for its ability to predict and explain behavioural intention across a wide range of health behaviours (Ajzen 1991; Perkins et al. 2007). A number of studies are supported by different theoretical and meta-analytic reviews, showing that behavioural intentions are reliably associated with behaviour. For example, in a quantitative meta-analytic review of 185 independently published studies of the TPB, Armitage and Conner (2001) found that across all behaviour, the average multiple correlations of attitude, subjective norm and PBC, accounted for 27% of the variance in the behaviour. The TPB studies indicated that the average correlation for behaviour beliefs to attitudes was 0.5; normative beliefs to subjective norms was 0.5 and control beliefs to PBC was 0.52. The researchers found that when behaviour measures were in the form of self-reports, the TPB accounted for 11% more of the overall variance than when behaviours were externally observed. This revealed that the TPB accounted for more of the variance in behaviour. This study showed that the PBC was found to contribute uniquely to the prediction of behaviour, demonstrating the efficacy of the PBC construct. However, Ajzen (1991) argued that under conditions where behavioural intention alone would account for small amounts of the variance in behaviour, PBC should be independently predictive of behaviour.

In general, PBC adds approximately 2% to the prediction of behaviour over and above intention, which may be significant in terms of the prediction of the behaviour. This result explains the utility of the PBC construct in relation to predicting behaviour (Ajzen 1991; Notani 1998; Godin & Kok 1996). Armitage and Conner (2001) also found that the correlation of attitude, subjective norm and PBC with intention accounted for 39% of the variance in the behavioural intention. They further reported that the PBC construct contributes substantially to the prediction of behavioural intention (43%), and behaviour (37%), data which confirms that the significance of the PBC construct becomes increasingly useful as a predictor variable (Ajzen 1991). In contrast, the correlation between subjective norms and behavioural intention was weaker than those between attitudes and the behavioural intention and between PBC and behavioural intention (Armitage & Conner 2001; Sparks et al. 1997). For the prediction of

behavioural intention, the authors found that self-efficacy accounts for an additional 7% of the variance in behavioural intention. Although the study showed that PBC and self-efficacy correlated significantly with both behavioural intention and behaviour, both account for similar percentages of the variance in behaviour (Armitage & Conner 2001). However, many studies found that self-efficacy was a more significant predictor of individuals' intentions to comply, than was PBC (Bandura 1997; Ajzen 2002; Jackson et al. 2003).

In another meta-analytic review of 16 different published studies involving the TPB, Ajzen (1991) examined the prediction of behavioural intentions in the TPB model. He found that the three predictors (i.e. attitude, subjective norm and PBC) accounted for a significant amount of variance in behavioural intention. The review also showed that, for several analysed behaviours, 20% to 78% of the variance was accounted for by these predictors for the different behaviours examined. The author also found that the multiple correlations between behavioural intention and its three predictors ranged from a low of 0.43 to a high of 0.94, with an average correlation of 0.71. Also, Ajzen (1991) indicated that PBC, together with intention, were significant predictors of behaviour, the average multiple correlation being 0.51 (Ajzen 1991). Interestingly, the behaviours appeared to be significantly related to volitional control and the correlation between perceived and actual control (Ajzen 1991). Although the addition of PBC was shown to improve prediction of behavioural intention, the average change in R^2 was not provided (Ajzen 1991). However, when PBC is a significant determinant of behavioural intentions or behaviours, details of the impacts of control beliefs concerning each facilitator and barrier might be useful in the development of interventions (Ajzen & Driver 1991). It is important to note that these analyses considered only the direct antecedents of behavioural intention and behaviour and were based upon a limited data set, including studies that have never been published. A meta-analysis by Godin and Kok (1996) found that the variance in behavioural intention explained by TPB variables was 40.9%. PBC was a significant predictor in 85.5% of health related studies, followed by attitude (81.5%) and subjective norm (74.4%). PBC contributed a mean additional 13% of variance to the prediction of behavioural intentions, over and above the attitude and subjective norm, and 12% to the prediction of behaviour. Others, such as Armitage and Conner (2001) found that PBC accounted for 6% of the variance in behavioural intention, over and above attitudes and subjective norms (Armitage &

Conner 2001). Therefore, Ajzen (1991) argued that the stronger predictive value of the PBC provides greater support for the TPB model in predicting and explaining behavioural intention and behaviour (Notani 1998).

Sheeran (2002) found that behavioural intentions accounted for 28% of the variance in behaviour through 422 longitudinal studies. Similarity, attitudes, subjective norms and PBC, usually account for 40% to 60% of the variance in behavioural intentions (Godin & Kok 1996). In addition, a number of studies have also shown that the PBC construct added significantly to the TPB model in predicting different types of behavioural intentions (Hagger et al. 2002; Armitage & Conner 2001; Conner & Sparks 2005). For example, a review of the literature was conducted by Godin and Kok (1996), which assessed 56 studies of various health-related behaviours such as addiction, eating, driving, oral hygiene, health screening and exercise behaviours. They also found that the TPB constructs explained 40.1% of the variance in the behavioural intention (Godin & Kok 1996). The authors reported that attitude toward the behaviour and PBC were the most significant TPB constructs for explaining intention. PBC was a significant predictor in 85.5% of the studies, followed by attitude (81.5%) and subjective norm (47.4%). On average, the PBC construct explained an additional 13% of the variance in behavioural intention; superior to both attitude and subjective norms. The researchers found that the TPB (e.g. addition of PBC) was significant in contributing to the prediction of behavioural intentions but not behaviour (Godin & Kok 1996; Notani 1998).

In comparative studies, there are many researchers who have indicated that the TPB is a distinct and more beneficial theoretical framework than the TRA, in explaining and predicting social behaviour (Godin & Kok 1996; Notani 1998; Armitage & Conner 2001; Hausenblas et al. 1997; Sutton 1998; Albarracin et al. 2001; Sheeran & Taylor 1999). Another study compared both the TPB and the TRA in a meta-analysis. Hagger and colleagues (2002) found that the TRA constructs (i.e. attitude and subjective norm) explained 37% of variance in behavioural intentions and 26% of the variance in behaviour. TPB was found to increase prediction of behavioural intention from 48% with TRA to 59% with TPB. Moreover, TPB was indicated to explain a greater proportion of the variance in behavioural intention (R^2 =0.38) compared to TRA (R^2 =0.28) (Madden et al. 1992; Ajzen

1991). By addition of the PBC construct, the TPB model accounted for 50% of the variance in intention and 29% of the variance in behaviour (Hagger et al. 2002).

Other studies have produced similar findings in meta-analytic comparisons of the TPB and TRA in different research contexts. Sutton (1998) found that the vast majority of the studies show robust support for the TPB model by evaluating the performance of TRA/TPB models in explaining and predicting behavioural intentions and behaviours. These models explained between 40% -50% of the variance in behavioural intention, and between 19% to 38% of the variance in behaviour (Sutton 1998; Armitage & Conner 2001; Sheeran & Taylor 1999). In addition, Smith and Biddle (1999) found that the TRA model accounted for 14.4% of the variance in intentions predicted by social norms and attitudes. In contrast, 44.5% of the variance in intention was accounted for by PBC and attitudes in the TPB model. The TRA accounted for 19% of the variance in intention, while 42% was accounted for by the TPB (Godin 1993). Overall, the TPB has been proven to be a useful theoretical framework in predicting and explaining greater percentages of behavioural intention variance than TRA, across a wide range of health related behaviours (Albarracin et al. 2001; Taylor et al. 2007; Godin & kok 1996; Hagger et al. 2002). Furthermore, it has been argued that not all researchers have applied the TPB model as originally conceptualised by Ajzen and Fishbein (1980) and Ajzen (1991), resulting in misleading findings and difficulty comparing studies that used the TPB (Ajzen 1991; Francis et al. 2004). Nonetheless, when the TPB model is operationalised as prescribed by Ajzen (2006), measurement issues are minimised and this may increase the predictive power of the TPB model (Ajzen 1991).

Although strong empirical support and extensive applicability has led to the popularity of the TPB, several pieces of research have demonstrated that the TPB is a quite successful model in explaining and predicting individuals' behavioural intentions and actual behaviours (Hagger et al. 2007; Carmack & Lewis-Moss 2009; Gredig et al. 2006; Whitby et al. 2006; Randall & Gibson 1991; Steadman et al. 2002; Pal et al. 2007; Blue 2007; Hillhouse et al. 1997). Using the TPB in the examination of compliance with security policies, Jie and colleagues (2009) found that the TPB model was able to explain 28% of the variance in behavioural intentions to comply with such policies, and 18% of the variance in PBC and

attitudes; however, there was no significant relationship predicting compliance intentions related to subjective norms. The findings of the study conducted by Jie et al. (2009) are generally consistent with previous research (e.g. Hagger et al. 2002; Armitage & Conner 2001; Madden et al. 1992).

2.9 Ability of the TPB to explain and predict nurses' behavioural intentions

From a nursing perspective, there is only limited evidence of the use TPB to assess nurses' behavioural intentions to comply with nursing policy in particular, and clinical practice in general. However, there are some studies which have used the TPB as a theoretical framework to assess nurses' behavioural intentions in specific clinical situations. For example, the TPB model has been utilised to study nurses' intentions to report child abuse (Feng & Wu 2005); nurses' intentions to provide home care (Vermette & Godin 1996); nurses' intentions to care for persons with AIDS (Dilorio1997); nurses' intentions to adhere to universal precautions for venipunctures (Godin et al. 2000); nurses' intentions to provide professional labour support (Sauls 2007); nurses' intentions to administer paracetamol to a febrile child (Walsh et al. 2005) and nurses' intentions to work with computers (Shoham & Gonen 2008). In general, nurses' behavioural intentions to perform different kinds of clinical practice behaviours can be predicted with a high degree of accuracy by the TPB constructs (i.e. attitudes, subjective norms and PBC) (Ajzen 1991; Jenner et al. 2002; Puffer & Rashidian 2004). These three TPB constructs have been able to explain the significance of variations in behavioural intention and behaviour, as well as identify the determinants of clinical practice behaviour (Ajzen 1991; Amritage & Conner 2001; Godin & Kok 1996).

In a nursing context, the studies of the TPB have provided strong evidence of the overall predictive value of nurses' behavioural intentions and have shown that attitudes have a pervasive influence on their behavioural intentions; with a lesser role for subjective norms (Nash et al. 1993; Walsh et al. 2005; Hagger et al. 2002). For example, McCarty and colleagues (2001) conducted a cross-sectional study using the TPB model to predict and explain nurses' behavioural intentions

to provide smoking cessation advice. Although they found that only the attitude (β=0.39, P<0.01) and PBC (β=0.42, P<0.01) constructs were useful predictors of nurses' behavioural intentions, subjective norm (β=0.30, P=0.60) was not indicated to be significant predictors of the variance of nurses' behavioural intention (Armitage & Conner 1999; Madden et al. 1992; Armitage & Conner 2001). A number of researchers found that subjective norm is the weakest predictor of behavioural intention and behaviour (Ajzen 1991; Armitage & Conner 2001). Due to the inadequacy and rare predictability of the subjective norm, some researchers deliberately remove, or suggest removing, this construct from analysis in the behavioural models (Armitage & Conner 2001). The non-significance of the subjective norms in the TPB model suggested their comparatively low influence on providing smoking cessation advice among nurses (Payant et al. 2008). The measure of the subjective norm used in the study was the unit that the nurses worked in; for example medical, surgical, cardiac, oncology, neurology, gynecology and orthopaedic. This was not consistent with suggestions by Ajzen (2002), in that the construct of subjective norm should examine how an individual feels about engaging in a behaviour. A simple examination of work environment does not capture this idea sufficiently. More specifically, the study was lacking in construct validity which might be the reason that this construct was not shown to be a significant behavioural predictor. However, PBC influences the effects that attitudes exert on nurses' behavioural intentions, where that attitude predicted behavioural intentions only among nurses who had strong perceptions of control (Ajzen 1991; Laschinger & Goldenberg 1993). Therefore, there is evidence indicating that the influence of PBC on behavioural intentions is the most significant contribution to predicting and explaining such behavioural intentions (Ajzen 1991; Conner & Sparks 2005; Notani 1998).

Furthermore, several nursing studies have shown that the strong influence of attitudes on behavioural intentions remains stable over time (Jenner et al. 2002; Whitby et al. 2006; Levin 1999). For example, in the study by Sauls (2007), a nurse's attitude exerted the most significant impact on their behavioural intention to perform professional labour support (r=0.83, P<0.0001) (Ajzen 1991). According to Ajzen (1991), attitude, behavioural intention and behaviour have consistently demonstrated that the more favourable an individual's attitude toward specific behaviour, the stronger is that person's behavioural intention to

express that behaviour. In 115 studies using the TPB, in which the attitude and behavioural intention relationship was measured, attitudes explained 24% of the variance in behavioural intention (Armitage & Conner 2001). Attitudes play a major role in predicting the behavioural intentions of nurses. Sauls (2007) suggested that nurses with a more positive attitude towards providing labour support are more likely to have the behavioural intention to provide that professional labour support. In addition, the results showed that a high positive rating of the nurses' behavioural intentions would improve their professional labour support and reduce the length of labour (Bernix 2000; Madden et al. 1992).

Edwards and colleagues (2001) conducted a cross-sectional survey in Australia, using self-report questionnaires, measuring the constructs of the TPB to identify the determinants of registered nurses' beliefs and attitudes regarding opioid administration. A survey questionnaire was developed and the measurement and scoring were completed following the guidelines of the TPB that prescribed by Ajzen and Fishbein (1980). Extensive surveys measuring the TPB constructs in relation to the behaviour of opioid administration were sent to 800 nurses and had a 56% response rate. They found that attitude, subjective norm and PBC constructs predicted nurses' behavioural intentions to administer opioids to patients for pain relief. They also found that the TPB model explained 40% of the variation in behavioural intentions. They concluded that control over administration of opioids ($r=0.32$, $P<0.01$), subjective norm ($r=0.29$, $P<0.01$), attitude ($r=0.22$, $P<0.01$) and belief-based attitudes toward opioid administration ($r=0.13$, $P<0.01$) are all independently able to influence nurses' behavioural intentions (Edwards et al. 2001). However, the construct of PBC was found to be the strongest independent predictor of behavioural intention, indicating the importance PBC plays in determining the registered nurses' behavioural intentions to administer opioids (Edwards et al. 2001). Moreover, this conclusion is consistent with Ajzen's (1991) vision that different constructs within the TPB could be more salient for different individuals in different situations. Similar to findings reported by Dilorio (1997), attitudes, subjective norms and PBC were significant influences on nurses' behavioural intentions to care for a person with AIDS. The author found that the TPB was able to account for 15.5% of the variance in nurses' behavioural intentions. However, Nash and colleagues (1993) found that the PBC was only predictive of nurses' behavioural intention to perform pain

assessment, accounting for 21% of the overall variance. Although the survey questionnaire was developed and the measurement and scoring were completed, following the guidelines of the TPB prescribed by Ajzen and Fishbein (1980), the study did not report any validity and reliability measures of the survey, as recommended by Francis and colleagues (2004). Due to the exploratory nature of the study conducted by Nash and colleagues (1993), the effect size (i.e. coefficient of multiple determination) was set at 22%. The small sample size, and the concern about the tool's psychometric properties, influence the generalisability of the study. Moreover, neither attitudes nor subjective norms were predictive of the nurses' behavioural intention (Nash et al. 1993). Although the subjective norm is consistently found to be the weakest of the TPB constructs (McCarty et al. 2001; Conner & Armitage 1998; Armitage & Conner 2001), the result of attitude not being a significant predictor was unexpected, because generally attitude was the most powerful predictor of behavioural intention in the TPB studies of health professionals (Hausenblas et al. 1997; Puffer & Rashidian 2004; Watson & Myers 2001; Sauls 2007; Armitage et al. 1999).

Several nursing studies have shown that the PBC construct exerts a significant influence on different behavioural intentions (Godin et al. 2008; Ajzen 1991; Armitage & Conner 1999). Examples of intentions studied include: nurses' intentions to care for Sever Acute Respiratory Syndrome (SARS) patients (Ko et al. 2004); nurses' intentions to provide continuous labour support (Payant et al. 2008); nurses' intentions to continue using a smoking cessation protocol (Bolman et al. 2002) and nurses' intentions to maintain patients' privacy (Tabak & Ozon 2004). In addition, it has been indicated that the impact of the PBC construct on nurses' behavioural intention was strong. Also, the predictive power of the PBC was not influenced by questionnaire format or social desirability (Sheeran & Orbell 1996; Armitage & Conner 1999).

O'Boyle and colleagues (2001) conducted research to examine the utility of the TPB in predicting and explaining compliance with hand hygiene guidelines, indicating that the PBC construct made the most significant contribution to variance in nurses' behavioural intentions towards their compliance (O'Boyle et al. 2001). In this study, 120 registered nurses, who worked in both adult medical and surgical intensive care units in four metropolitan teaching hospitals, were

recruited to assess the TPB constructs. It was found that the TPB model explained 56% of the variance in the nurses' behavioural intentions to comply with hand hygiene guidelines. The PBC construct was the most significant influence on nurses' behavioural intentions to comply with the hand hygiene guidelines ($\beta = 0.60$, $P<0.01$), followed by attitude ($\beta=0.46$, $P<0.01$) and subjective norm ($\beta=0.38$, $P<0.01$) (O'Boyle et al. 2001). Similar findings have shown that the PBC construct was the most prominent predictor among the TPB constructs (Godin et al. 2000; Ko et al. 2011; Ajzen 1991; Godin & Kok 1996; Notani 1998; Conner & Sparks 2005). The study of O'Boyle and colleagues (2001) showed that the TPB was an appropriate theoretical framework for predicting and explaining nurses' behavioural intentions to carry out required compliance behaviour (Ajzen 1991; Conner & McMillan 1999; Kovac & Rise 2011). However, authors did not provide the statistical results to support their conclusions. In addition, the TPB constructs did not predict actual compliance behaviour regarding the hand hygiene guidelines, which might be more sensitive to the intensity of nurses' work activity in the clinical setting than to internal motivational factors (O'Boyle et al. 2001). In general, the main outcome in the TPB model was the behavioural intention to carry out the compliance. Therefore, the TPB model was utilised for predicting nurses' behavioural intentions to carry out the compliance, but not for the actual observed compliance behaviour itself (Godin et al. 2000). A common theme to emerge from the literature is that estimates in self-reporting regularly exceed observed performance (O'Boyle et al. 2001; Ajzen 1991; Scott et al. 2007). This might suggest that while nurses understand the importance of the activity and have good behavioural intentions, activity levels influence compliance behaviour (Pittet et al. 1999).

In another study in Taiwan, Ko and colleagues (2011) used the TPB to explore nurses' behavioural intentions to comply with occupational post-exposure management. A total of 1134 registered nurses were surveyed to assess the TPB constructs. In this study, Structure Equation Modelling (SEM) was applied to examine the TPB model by using nurses' intentions as the dependent variable and the TPB variables (i.e. attitude, subjective norm and PBC) as the independent variables (Ko et al. 2011). The findings provide robust support for the applicability of the TPB model, which accounted for 54% of the variance in nurses' behavioural intentions. The authors found that the PBC ($\beta=0.58$), subjective norm ($\beta=0.15$) and attitude ($\beta=0.12$) were significant and direct influences on nurses'

behavioural intentions to comply with post-exposure management (Ajzen & Driver 1992). In other words, the findings indicated that nurses' behavioural intention was primarily predicted by their perceptions of their capability to comply, secondly by their perceptions of the opinions of important referent others towards compliance, followed by their attitudes to comply with post-exposure management (Edward et al. 2001; Feng & Wu 2005; Sauls 2007). As prescribed by Ajzen (1991), Ko et al. (2011) found that the strong influence of the PBC construct added significantly to the accuracy of predicting nurses' behavioural intentions (Conner & Sparks 2005). According to the subjective norm construct, it is not surprising that subjective norms have emerged as significant predictors of behavioural intention in this study. This is noteworthy since this predictor is usually the weakest of the three theoretical components (Ajzen 1991; Armitage & Conner 2001). The explanation might be related to the conceptualisation of subjective norm in terms of global perception of social pressure from others to perform certain behaviour (Armitage & Conner 2001). In this study, it appears that nurses in Taiwan respect authority and are concerned about the view of other colleagues (Ko et al. 2011).

Moreover, the findings are significant and theoretically aligned with the TPB model. Ajzen (1991) asserts that, in situations where attitudes toward the behaviour are positive and contextual support for the behaviour is good, beliefs about nurses' capabilities to perform the behaviour might be better predictors of behaviour than actual control over the behaviour. In this study, the TPB constructs were used in predicting and explaining the variance of nurses' behavioural intentions to comply but were not appropriate for dealing with the actual realisation of the post-exposure management behaviour of the nurses (Sauls 2007; Payant et al. 2008; O'Boyle et al. 2001). Furthermore, the authors found that nurses believed that perceived barriers, such as inconvenience due to high levels of workload, lack of supportive work environment and time constraints, negatively influence their behavioural intentions to comply with post-exposure management (Whitby et al. 2006; O'Boyle et al. 2001; Ko et al. 2004; Sauls 2007; Feng & Wu 2005).

As indicated previously, the relationships predicted and explained by the TPB have generally been supported in the clinical practice performance setting for the

nursing workforce. More specifically, it has been found that the TPB constructs (attitudes towards the behaviour, subjective norms and PBC) are effective in predicting and explaining nurses' behavioural intentions to comply behaviour. Puffer and Rashidian (2004) conducted an exploratory mixed methods study to examine the utility of the TPB model in predicting and explaining nurses' behavioural intentions to comply with clinical guidelines in providing smoking cessation advice. 88 members of a practice nurse group in the North of England were sent a self-report questionnaire, developed and piloted with a small group of practicing nurses, measuring the constructs of the TPB (Ajzen 2002). 48 practising nurses returned the questionnaire, representing a 54.5% response rate. By measuring both the direct and indirect variables, the researchers found that the direct measures in the TPB model were able to explain up to 40% of the variance in behavioural intention. The indirect measures alone explained 21% of the variance in behavioural intention (Puffer & Rashidian 2004). However, they also found that the strongest relationship with behavioural intention was the PBC (r=0.55), followed by attitude (r=0.45) and indirect PBC (r=0.42), which indicates that attitude and PBC were highly significant determinants of behavioural intentions (Ajzen 1991; McCarty et al. 2001; O'Boyle et al. 2001; McKinlay & Cowan 2006; Cote et al. 2012).

Additionally, the TPB explains nurses' attitudes toward their behaviour in terms of compliance with clinical guidelines in providing smoking cessation advice, which was itself based on nurses' beliefs about behavioural outcomes and the subjective norms that derived from beliefs about the normative expectations of others. PBC was strongly significant in understanding nurses' behavioural intentions (Ajzen & Driver 1992; Ajzen 1991; Johnson 2003; Godin & Kok 1996). In contrast, Puffer and Rashidian (2004) found there was a weak relationship between subjective norms and behavioural intention (r=0.063) (Armitage & Conner 2001; Vermette & Godin 1996; Conner & Sparks 2005; Hagger et al. 2002). Although the authors followed the guidelines of the TPB model carefully, the study sample size was inadequate to accurately assess the TPB model, as well as insufficient in a study aiming to predict nurses' intentions and behaviour (Armitage & Conner 2001; Conner & Sparks 2005). As a result, the majority of respondents had a particular interest in coronary heart diseases only, limiting the generalisability of the findings to other aspect of guidelines. Puffer and Rashidian (2004) suggested that a lack of time for implementation and inadequate training were significant

obstacles. However, these authors strongly emphasised that their findings provided evidence supporting the efficiency of the TPB for predicting and explaining nurses' behavioural intentions to comply with clinical guidelines (Ajzen 1991). Overall, they concluded that the TPB model offered a comprehensive understanding of the underlying determinant factors that are likely to influence nurses' behavioural intentions to comply with nursing policy (Godin et al. 2008; Ajzen 1991; Conner & McMillan 1999; Tabak & Ozon 2004).

Having reviewed a wide range of different psychosocial theories, it appears that the TPB is a successful and accurate theoretical framework for explaining and predicting nurses' behavioural intentions, which contribute to compliance or non-compliance with nursing policy (Ajzen 1991; Ajzen & Fishbein 1980). Furthermore, the support provided by different studies, such as meta-analytic reviews and other relevant research, shows that the TPB model was the most appropriate and reliable theoretical framework (Armitage & Conner 2001; Webb & Sheeran 2006; Albarracin et al. 2001; Sheeran 2002; Ajzen & Driver 1992). Such empirical support justifies the selection of the TPB for this current study, which will examine nurses' behavioural intentions towards compliance behaviour (Ajzen 1991; Puffer & Rashidian 2004; Kovac & Rise 2011). This literature review has focused on the TPB model because it is shown to be a useful and highly significant psychological framework that has been used to determine and explain the extent to which nurses' attitudes, subjective norms and PBC influence their intentions to comply with nursing policy (Dilorio 1997; Ajzen 1991; Jenner et al. 2002; Feng & Wu 2005). Therefore, these studies, with similar theoretical framework (i.e. the TPB), were reviewed for insight into, and direction on, the TPB's applicability to this research study.

2.10 Aims of the study

The main aim of this study is to utilise the TPB (i.e. attitudes, subjective norms and PBC) to predict and explain behavioural intentions to comply with nursing policies and procedures within a multicultural nursing workplace at Prince Sultan Military Medical City (PSMMC) in the KSA (Ajzen 1991). In order to examine the usefulness of this theoretical model for this purpose, a specific policy has been

selected as a focal theme, and to be representative of the other nursing policies: namely the pre-operative skin preparation policy. This policy is a significant first line defence against post-operative infection (Borgey et al. 2012; JBI 2003; Parks 2007; Segal 2006; Webster & Osborne 2006). However, non-compliance with pre-operative skin preparation policy among the nursing workforce is strongly associated with an increased risk of infection, resulting in prolonged lengths of hospital stays, as well as causing higher levels of mortality and morbidity, as well as financial concern for the healthcare agencies (Dizer et al. 2009; Kjonniksen et al. 2002; Farr 2000; Manian & Ponzillo 2007).

A specific aim of this study is to explore the beliefs of nurses about complying with pre-operative skin preparation policy. An exploratory belief elicitation study was conducted regarding nurses' perceptions of complying with pre-operative skin preparation policy; particularly the benefits of, and barriers to, the compliance behaviour. The reason for this exploratory study being carried out was due to there having been no previous studies of compliance with nursing policies carried out in the KSA. Therefore, in order to investigate the usefulness of this theoretical model for this purpose, the study will involve mixed methods research using both qualitative and quantitative methods to gain a more comprehensive understanding of problems, and to answer questions that could not be answered by either approach alone (Creswell & Plano Clark 2011).

2.11 Objectives of the research

The main objectives of this research are:

1. To examine the nurses' beliefs underpinning their behavioural intentions to comply with the pre-operative skin preparation policy;
2. To assess the ability of the TPB to explain and predict the behavioural intentions of the members of a multinational nursing workforce towards compliance behaviour;
3. To determine the influence of attitudes, subjective norms and PBC on nurses' behavioural intentions to comply with the pre-operative skin preparation policy;

4. To gain understanding of the factors related to nurses' behavioural intentions to comply with nursing policies when working in the KSA, in order to design interventions that can ensure safe and high quality patient care.

2.12 The research question

The research seeks to discover the answer to the overall research question:

How useful is the TPB for understanding and evaluating the factors that contribute to intentions amongst the multicultural nursing workforce to comply with the pre-operative skin preparation policy in PSMMC?

Chapter 3: Elicitation study

Introduction

This chapter provides an overview of the methodological design used to conduct this study. The rationale for carrying out an exploratory study using a cross-sectional survey is presented. Based on Ajzen's (2006) TPB framework, it is important to elicit behavioural, normative and control beliefs of the multicultural nursing workforce about compliance with pre-operative skin preparation policy in order to construct the TPB. This chapter covers a detailed description of the elicitation study, starting from recruitment of participants, data collection and analysis. Ethical considerations are highlighted. The chapter concludes with a discussion of the findings obtained from the elicitation study, including the categories and frequencies of participants' responses for each of the TPB components.

3.1 The research design

This study is a two-phase design using a mixed methods approach. Phase one is a qualitative study to illustrate how an elicitation method can be used to identify salient beliefs among the members of a multicultural nursing workforce. The results of phase one will be used to develop a questionnaire for the second phase, which will involve a cross-sectional survey.

3.2 Rationale for the research design

The rationale for using a mixed methods approach is to focus on the relevant strengths of both qualitative and quantitative methods in order to provide highly significant contributions to the research area, as well as offering a robust analysis and understanding of the issue (Creswell 2009). Tashakkori and Creswell (2008) argued that a mixed methods study is an effective way in which to investigate, collect and analyse data, integrate the results and provide inferences by employing both qualitative and quantitative approaches in one study.

The integration of qualitative and quantitative research in a single study is referred to as employing mixed methods (Creswell 2009; Creswell & Plano Clark 2011; Tashakkori & Teddlie 2003). According to Creswell (2009), sequential mixed methods procedures seek to elaborate the findings of one method with another method. This might involve beginning with a qualitative approach for exploratory purposes, following up with a quantitative survey approach with a large sample so that results can be generalised to a population (Clark et al. 2008; Tashakkori & Teddlie 1998).

In this research, the qualitative data (phase one) will develop, enhance and explicate the meaning of the quantitative study (phase two) in order to achieve the research objectives (Jayaratne 1993; Plano Clark et al. 2008). More specifically, a mixed methods design is ideal because it will allow a qualitative exploration of the behaviour of the multicultural nursing workforce and then the results will be used to develop a quantitative instrument that will examine the relationship between the variables in the TPB (Ajzen 2002; Creswell 2009). In this way the results from the qualitative method will inform the development of the quantitative instrument, taking into account additional concerns, such as sampling and implementation, as well as measurement decisions (Creswell & Plano Clark 2011; Greene et al. 1989) (Table 3.1).

Table 3.1: Qualitative and quantitative approaches in this study

	First Phase: Qualitative Research	Second Phase: Quantitative Research
Purpose	• To illustrate how an elicitation method can be utilised to determine salient beliefs by using open-ended questions based on the components of the TPB. The theory will be used to examine beliefs regarding compliance with pre-operative skin preparation policy among a multicultural nursing workforce (Ajzen 2002). • To provide insights into the setting of a problem, generating ideas for later quantitative research (phase two). • To develop the TPB questionnaires to be used in the second phase (Ajzen 1991).	• The data gathered in phase one will be used to develop a questionnaire using the TPB as theoretical guidance. This will assess the multicultural nursing workforce's intentions to comply with pre-operative skin preparation in PSMMC (Ajzen 2002). • To examine nursing intentions to comply with pre-operative skin preparation policy and generalise results from a selected sample to the population of the multicultural nursing workforce at PSMMC (Ajzen 1991, 2002).
Sample	Using a convenience sampling strategy.	Using a convenience sampling strategy.
Data Collection	An open-ended questionnaire using a survey technique (Ajzen & Fishbein 1980).	Closed-ended questionnaires using a survey technique, employing the TPB as a theoretical guide (Ajzen 2002).
Data Analysis	The data will be analysed by content analysis (Ajzen & Fishbein 1980).	Statistical data analysis using the Statistical Package Social Sciences (SPSS) software version 21.
Outcomes	• Exploratory results. • The results are not conclusive. • The results are not for generalisation. • The results are a basis for the second phase, informing the development of the questionnaires (Ajzen 2002).	• To examine the theoretical framework (TPB) determinants of non-compliance with pre-operative skin preparation policy among the multicultural nursing workforce at PSMMC (Ajzen 1991).

3.3 Rationale for the elicitation study

The qualitative research paradigm was developed for use with the social sciences, enabling researchers to understand social and cultural phenomena. It involves interpretive and naturalistic approaches in order to explore and discover issues about the problem (Denzin & Lincoln 2000; Burns & Grove 2011). The methods used in qualitative research can provide rich information and details about the personal experience or viewpoints, values, actions, meanings and perceptions of the individuals being studied (Maxwell 2005). Hence, qualitative approaches are designed to address questions of meaning and interpretation, as well as helping to construct realities (Newman et al. 2003). Therefore, in order to apply the TPB to try and understand the psychosocial determinants of compliance behaviour among a multicultural nursing workforce, an elicitation study is an essential first phase. Ajzen (2002) suggested that attitudes, subjective norms and PBC are based on corresponding sets of beliefs. An elicitation study is therefore necessary to identify the salient beliefs held by members of a multicultural nursing workforce, which underlie the decision to comply with the pre-operative skin preparation policy, or not to comply. In order to elicit information about a nurse's salient beliefs within a certain population, Ajzen and Fishbein (1980) suggested that researchers need to conduct an elicitation study using open-ended questions in order to evaluate nurses' behavioural, normative and control beliefs; to perform a content analysis to rank-order those beliefs and to identify the most salient beliefs (Van der Pligt & Eiser 1984).

The rationale for using an elicitation study is to identify salient consequences (behavioural beliefs), social referents (normative beliefs) and salient circumstances (control beliefs) that can construct and inform those beliefs (Ajzen 2002). The qualitative approach is significant because there is no previous study addressing the beliefs of the multicultural nursing workforce in the KSA, regarding compliance with pre-operative skin preparation policy. As a result, no formal hypotheses can be made. The qualitative approach (i.e. the elicitation study) will provide a clear understanding of nurses' beliefs regarding compliance with pre-operative skin preparation policy at PSMMC (Ajzen 2002). In addition, this elicitation study provides the basis for constructing the standard questionnaires that will be used in the main study (Ajzen 2002). The use of open-ended questionnaires is important in the elicitation study, as it enables

participants to express general attitudes and beliefs, without any bias imposed by structured questionnaires (Ajzen & Fishbein 1980).

In this research, my role at a high managerial level in the nursing administration at the PSMMC since 2006 (i.e. Assistant Director of Nursing in the PSMMC) has shaped my values and assumptions about nurses' performance; I consider myself as an 'insider researcher' with respect to this study (Mosse 2005). According to Breen (2007), insider researchers are those who choose to study a group to which they belong (i.e. in this case the PSMMC). Being an insider researcher may have several advantages including a greater understanding of the culture being studied, not altering the flow of social interaction unnaturally, promoting rapport with participants, access and ethics. It will also help in knowing where to gather data and how to best approach participants, knowing the politics of the institution, minimising misinterpretation, as well as having empathy for the participants' perspectives (Unluer 2012). However, there might be some disadvantages to this role that have the potential to influence the findings and therefore their trustworthiness (Unluer 2012). For example, closeness to the real situation for the study may hinder the researcher from seeing all dimensions of the whole picture during the data collection process (Smyth & Holian 2008). Another risk might be that the insider researcher gains access to sensitive information. Hence, to conduct credible insider research, it is important to overcome the disadvantages to ensure credible insider research. As an insider, I have developed an explicit awareness of the potential influences of perceived bias on data collection and analysis, respect the ethical issues related to the anonymity of the participants, consider the issues that may affect my role regarding coercion, compliance and access to confidential information at each stage of the research (Smyth & Holian 2008; Unluer 2012). In this research, certain precautions were required by the design and method. For example, due to my role as an insider researcher, it is likely that an open-ended questionnaire employed with face to face semi structured interviews and focus group formats, may not be appropriate, for two key reasons. Firstly, it is likely that my position within PSMMC might cause stress and concern to the participants, as well as bias results due to the potential to receive 'guarded' responses. Secondly, if I am notified as the interviewer nurses could well refuse to participate, which is their right. Alternatively, could feel pressured into participating because of my seniority. Such an outcome could impact the research data because participants

may not be inclined to tell the truth because of a resistance to risk-taking and change, a lack of confidence, fear about affecting their career, or fear of the research outcomes (Breakwell et al. 1995; Wimmer & Dominick 2002; Oatey 1999; Funk et al. 1991; Hicks 1996). Therefore, a self-completion questionnaires option will ensure the protection and anonymity of participants and should therefore improve the quality of data collection, as well as encouraging overall response rates (O'Cathain & Thomas 2004; Dornyei & Taguchi 2010).

3.4 Method

3.4.1 Research setting

This study was conducted at PSMMC in the KSA. The target population for this research was the multicultural nursing workforce located at PSMMC. The total accessible population includes 750 registered nurses performing pre-operative skin preparation routines in adult medical surgical units. According to hospital policy, English is the official language among all healthcare personnel at PSMMC, including nurses (PSMMC 2009).

3.4.2 Sampling strategies

The aim of the qualitative research in the first phase of this study is not to generalise the findings to the whole population, because the intent is to gain an in-depth understanding of, and discover meaning about, a particular experience, beliefs, situation or cultural element (Polit et al. 2001). The results will be useful to develop questionnaires, which will be administered later in the quantitative research (i.e. phase two) (Tashakkori & Teddlie 2003).

Qualitative studies can begin with a convenience sample, especially if the researcher needs information about beliefs in order to construct a standard questionnaire for use in the main study (Collins et al. 2006). A convenience sample is easy, accessible and not very time consuming in the context of this design (Burns & Grove 2011). Although nurses in PSMMC generally work 12 hour

shifts (PSMMC 2006), convenience sampling is an appropriate way to approach all nurses who are the most available, to participate in this study on various days and at different times. Therefore, a convenience sample was selected because it may increase the probability that participants will be interested in taking part in the study (Morse 1991).

3.4.3 Sample criteria

The sample was selected from the accessible population that meets the required characteristics of the sampling criteria, taking into account both inclusion and exclusion criteria (Tappen 2011).

3.4.3.1 Inclusion criteria

- Registered nurses performing bedside nursing care, who have valid licences and who have succeeded in all nursing competency exams at PSMMC.
- Registered nurses performing pre-operative skin preparation practice in adult medical surgical wards, where elective adult patients are prepared for surgery.
- Both male and female registered nurses' working day and night shifts.
- Aged 21 years or over, because this is the allowable age to be recruited to work at PSMMC (Tumulty 2001).
- Practical experience of performing the pre-operative skin preparation procedure for not less than three months, (i.e. the nurses must have finished their probationary period) (PSMMC 2009).

3.4.3.2 Exclusion criteria

- Registered nurses working in specialised units such as oncology, intensive care, gynaecology and paediatrics, because these specialisms use different nursing policies or standards and because of the significant potential for increased workload and nursing shortages.
- Registered nurses who participated in the pilot study.

- Registered nurses working as head nurses, because they work in administration and do not usually perform pre-operative skin preparation practice.

3.4.4 Sample size

In qualitative research, the sample size is not based on probability computation but rather on expert opinion. Sandelowski (1995) argued that the sample size should not be either very small, which makes obtaining sufficient data difficult, or too large, so that it is difficult to undertake a deep case-oriented analysis. Daniel (2012) suggested that a typical sample size for exploratory research, or a pilot study, may range from 20 to 150 participants. Francis and colleagues (2004) recommended that at least 25 participants should be included for any elicitation phase of research that is using an open-ended questionnaire. However, other authors claim that there are no strict criteria for sample size (Holland & Rees 2010), with sample sizes in other belief elicitation studies ranging from 5 (Puffer & Rashidian 2004) to 155 (Zhang et al. 2007).

In this study, the sample size should permit the collection of deep and richly textured information, which will allow the capture of a wide range of nurses' beliefs in order to construct a standard questionnaire to use in the main study (Sandelowski 1995). Therefore, based on guidelines provided by Francis et al. (2004) and recommended by Godin and Kok (1996), the sample size of this study was 50 participants.

3.4.5 Pilot study

A pilot study is a very important part of any qualitative research, as it can generate a deep understanding of the research process. In this research the pilot study aims to pre-test the questionnaires and identify any problems related to the research design, the sampling strategy, the development of the evidence collection instrument and the analysis, in order to provide opportunities for

adjustment if necessary (Brink & Wood 1998). Nirmala and Edison (2011) argued that the aims of conducting a pilot study are:

- To strengthen the research design and improve the precision of data analysis;
- To provide the opportunity to determine if the research design, questionnaire, sampling strategy, data collection and analysis are effective and achievable;
- To prevent the researchers from wasting a lot of time and money in order to complete the research programme. For example, a pilot study determines whether the proposed study is feasible or not, as well as helping researchers to reveal and revise any potential problems during the main study, which can save time and reduce cost.

The rationale for conducting a pilot study is to assess whether any items are unclear or difficult to answer, too repetitive, superficial, inappropriately worded or might produce inconsistent responses (Bowling 2002; Tashakkori & Teddlie 1998; Polit et al. 2001). More specifically, the pilot study is required to improve the research questionnaire and identify any difficulties in answering the questions, in order to modify the wording if necessary (Mason & Zuercher 1995).

For this research, the highest frequency beliefs in the existing literature have been used to construct a preliminary questionnaire. Thereafter, a pilot study was conducted, comprising a small-scale version of the main study and involving similar participants to those who were to be included in the main study; with particular emphasis on improving the questionnaire (Francis et al. 2004) (Appendix C). The pilot study questionnaire was based on Ajzen's (2006) TPB, and as recommended by Francis and colleagues (2004), it helped to assess each question of salient beliefs about compliance behaviour, including behavioural beliefs, normative beliefs and control beliefs. Specifically, five qualified registered nurses from adult medical surgical units in the PSMMC were selected as a convenience sample, in order to test the questionnaire's suitability. This pilot study asks the same questions as are in the main study, and was able to shed light on any issues that may be used to improve the clarity of the questions. The pilot study followed the same governance procedures, and participants are given

the same information as in the main phase of the study. However, based upon the results of the pilot study, it was concluded that there are no specific changes which need to be made to the questionnaire to be used in the elicitation study.

3.4.6 Ethical considerations

In both the qualitative and quantitative phases of data collection, an ethics application was submitted via the Electronic Research Governance Online (ERGO) system at Southampton University (UoS) and to the ethics committee at PSMMC in the KSA. Ethical approval was obtained prior to the commencement of data collection from the UoS and the Ethics Committee of the PSMMC (Appendices D & E). The researcher followed Southampton University's ethical guidelines during this research. The researcher provided an invitation letter and information sheet to potential participants, based on the standard templates used within Southampton University. These briefly explained the purpose, the procedures and the expected benefits of this study.

There are four ethical principles in nursing research namely: beneficence, respect, justice and informed consent (Cherry & Jacob 2005). In both phases of this study, the researcher emphasised and assured the participants that they would not be harmed in any way by the research. The human dignity of all participants was respected and all were assured that their participation, or non-participation, would not affect them in any way. In addition, participants were informed they had the right to withdraw from the research at any time without penalty and without giving a reason. No payment was made for participation or in compensation for any time lost.

3.4.7 Maintaining confidentiality and anonymity

The results of both the qualitative and quantitative phases will not contain any personal identifying information. In the case of both study phases (i.e. first and second phases), the participants were not required to identify themselves on the questionnaire; a protocol designed to maintain the anonymity of the participants. One of the main reasons for participants in this study to remain anonymous was in order to ensure that the researcher's position as Assistant Director of Nursing

at PSMMC did not, in any way, influence the participants' responses. However, ensuring their confidentiality also makes respondents more willing to participate in studies (Bryman 2006; McColl et al. 2001). The return of completed questionnaires was being taken to imply consent, while maintaining the anonymity of the participants.

Regarding issues of confidentiality and anonymity, the researcher emphasised and ensured that only he and his research supervisory team would have access to the collected data, which would remain confidential (Polit & Beck 2004). When a member of the nursing staff completes the questionnaire, he or she will put the questionnaire in a private envelope that would only be opened by the researcher. In addition, the information was used solely for this research, and no other purpose. The researcher ensured that data will be stored in a secure place in an appropriate environment; for example, a locked filing cabinet or as password-protected files on a computer. Research data will be retained for a period of 10 years in compliance with the data protection policy at the Faculty of Health Sciences, University of Southampton, UK.

3.4.8 Recruitment

There are various different recruitment methods; researchers have to select a suitable recruiting strategy based on the type of experimental design and the sample required (Burns & Grove 2011). A successful recruitment strategy commences with a proper plan for identifying and inviting individuals to participate in the research. This plan should include criteria for screening eligible participants, the number of people to be recruited, the place and the method to be used. In this study, the Nursing and Research Departments at PSMMC assisted and supported the researcher to recruit participants and collect data; according to the hospital's standard ethical and professional procedures.

In the preparation process to access the field, the researcher conducted a presentation for senior nursing managers to outline the purpose and significance of the study, as well as the process of the study. They acknowledged the

significance of the study and they were keen to support the research. In the first phase, the hospital's Nursing Administration department invited nurses to participate and provided an anonymous questionnaire pack containing an invitation letter, participants' information sheet that explained the purpose and procedure of the study and a copy of the questionnaire (Appendices F, G & H). Those interested in taking part in the study were asked to return the completed questionnaires in a private envelope, which they can drop into a locked box in the nursing administration office. The approximate time to complete the questionnaire was estimated to be between five and ten minutes.

3.4.9 Data collection

Data collection is the procedure for gathering the specific information generated in response to the research questions (Rattray & Jones 2007; Burns & Grove 2011). Data collection has implications for analysis which, in turn, are associated with the procedure of theorising and writing (Maxwell 2005; Quinn-Patton 2002). In this study, the main method for data collection is asking the participants questions using self-completion questionnaires. According to McColl and colleagues (2001), self-completion questionnaires are the method of choice, which is often dictated by several constraints in health studies. At PSMMC a multicultural nursing workforce predominates, which may increase the constraints against participating in this study (PSMMC 2009; Roxburgh 2006). For example, nurses may not express their opinions because they are afraid of being judged, or they may hide the truth, especially when it involves others (Phellas et al. 2007; Bryman 2012). However, Bryman (2012) suggested that self-completion questionnaires which ensure confidentiality, anonymity and increase the response rate, are optimal for respondents. As a consequence, this study used self-completion questionnaires to provide high levels of anonymity and to enable participants to return questionnaires without fear of retribution (Gray 2009; Hill et al. 2003). The data were collected within three weeks; however, Nursing Administration in PSMMC provided a general follow-up through a meeting and a memorandum, which was judged to have improved the response rate.

3.4.10 Development of the questionnaire

In this study, salient beliefs were elicited by using six modified open-ended questions that were designed in accordance with the guidelines provided by Ajzen and Fishbein (1980) and Ajzen (2002). After some demographic questions, participants were asked about the advantages and disadvantages of compliance with, or of following, pre-operative skin preparation policy (behaviour beliefs/salient consequences). The questionnaire also asked about different classes of people who may approve or disapprove of compliance or of following the pre-operative skin preparation policy (subjective norm beliefs/ social referents). There were also items in the questionnaire about the constraints and factors that make it easy or difficult to comply with or follow the pre-operative skin preparation policy (perceived behavioural control/salient circumstances) (see Appendix H). Several studies have conducted similar elicitation exercises, using open-ended questions to develop the belief-based measures for predictor constructs in the TPB model (Armitage & Conner 1999; Puffer & Rashidian 2004; Payant et al. 2008; Sutton et al. 2003).

3.4.11 Data analysis

The qualitative approach examines the individual 'holistically' within that individual's natural environment (i.e. a fully contextualised approach) (Gelo et al. 2008). Similarly, Silverman (2006) argued that the aim of qualitative research is to understand the participant's voice and to see how categories, texts and documents can be analysed for different purposes. Meanwhile, Viasmoradi et al. (2013) indicated that there are different types of data analysis relating to qualitative research, depending on how structured the questions are. In addition, Nolan (2008) reported that qualitative analysis is intimately linked to data collection and includes both cognitive principles and the application of varying structured techniques. Qualitative content analysis and thematic analysis are two commonly used methods in data analysis of nursing research (Sandelowski & Barroso 2003; Viasmoradi et al. 2013).

The content analysis is more frequently used in nursing studies, and has been developed to transform qualitative data into more quantitative forms within

frameworks (Dixon et al. 2008). In content analysis, the data are analysed qualitatively and quantitatively at the same time (Gbrich 2007), using a descriptive approach in both coding of the data and interpretation of quantitative counts of the codes (Morgan 1993; Viasmoradi et al. 2013). The purpose of content analysis is to illustrate the characteristics of the document's content by examining who says what, to whom and with what impact (Bloor & Wood 2006; Viasmoradi et al. 2013).Content analysis is often used as a term to describe different strategies to analyse text (Powers & Knapp 2011).However, content analysis normally involves organising and integrating narrative, qualitative data according to emerging concepts and themes. This is a process for analysing written material in an objective and systematic fashion, usually used with the goal of finding quantitative measuring variables (Polit et al. 2001; Polit & Beck 004).Silverman (2006) describes the process of content analysis as creating a set of categories, and then counting the number of instances that fall into each category. It is important to note that content analysis is a different approach and has different aims, as compared to thematic analysis. Braun and Clarke (2006), describe thematic analysis as an independent descriptive method that will help determine, analyse and report themes (patterns) within data. Thematic analysis is often applied in low level description to data sets, and to interpret different aspects of the study topic (Viasmoradi et al. 2013). In the thematic analysis, the data are purely qualitative, offering a detailed and nuanced account (Braun & Clarke 2006; Polit & Beck 2004). In addition, the significance of a theme in the thematic analysis is not necessarily dependent on quantitative measures; it captures something significant about data in relation to the overall research question and represents the meaning within the data set or the level of response pattern (Viasmoradi et al. 2013; Braun & Clarke 2006; Spencer et al. 2003).

In this study, content analysis was viewed as the most appropriate approach for the elicitation study and to analyse the open-ended questions (Dixon et al. 2008; Miles & Hubermann's 1994). This was mainly because the individual's beliefs related to each of the TPB constructs and produced short responses. Therefore, a descriptive, rather than interpretive analytical, approach such as content analysis was required (Viasmoradi et al. 2013; Silverman 2006). Hsieh and Shannon (2005) reported that content analysis is an inductive method of analysis that is based on inferring the latent meaning in textual materials. Dixon and colleagues (2008) suggested that content analysis is frequently used in social studies which can

identify the categories and themes in order to develop data code by counting the number of instance that fall into each category (Silverman 2006). In terms of this study, Ajzen (2002) suggested that the analytical process will determine categories of positive and negative results or consequences of nurses' behaviour, or social referents, as well as difficult and easy circumstances, in order to create the belief structures' underlying behavioural intentions. The content analysis is essential in order to elicit and understand compliance behaviour (Ajzen 2006). The rationale behind the data analysis for the elicitation questionnaires is that respondents have to provide a description of compliance behaviour, which should be carefully defined to the respondents in terms of its target, action, context and time (TACT) (Ajzen & Fishbein 1980).

The contents of the respondents' answers were analysed by labelling the subjects or themes and listing them to identify the frequency of each salient belief. Ajzen and Fishbein (1980) suggested that data should be coded, based on the identification of content categories, in order to allow a numerical analysis. Content analysis in qualitative studies includes data coding that enumerates the frequency of beliefs in each category, with the frequency count representing the number of times a particular belief appears in the data (Ajzen 2002; Francis et al. 2004). In this study, content analysis was carried out through interpreting the responses and reading and re-reading the transcripts of the participants, until the main categories within the responses began to emerge for each of the TPB components (Francis et al. 2004). Each coding unit was defined and a coding frame was developed for all the data, based on the identified categories. According to Silverman (2006), the development of a coding framework begins by summarising and identifying the data carefully, reading the transcript line by line, as well as applying a paraphrase or label (i.e. code) that describes what the researcher has interpreted in the passage as significant. A coding frame was devised that consisted of a list of subjects and a definition of each subject (Smith 2000), as shown in tables (3.2, 3.3, 3.4, 3.5, 3.6, 3.7) below.

Table 3.2: Attitude "Advantages of carrying out the compliance with pre-operative skin preparation policy"

Code Number	Code	Description of Code
1	Prevent/reduce/ limit/ decrease	Comments related to prevent, reduce, limit and decrease the risk of infection.
2	Improve patient care	Comments related to patient care improvement
3	Avoid delay/cancel	Comments related to delay or cancel the surgical procedure of the patient.

Table 3.3: Attitude "Disadvantages of carrying out the compliance with pre-operative skin preparation policy"

Code Number	Code	Description of Code
1	Skin irritation	Comments related to chance of getting a skin irritation.
2	Cause skin injury	Comments related to cause skin injury to the patient.

Table 3.4: Subjective Norms "Individuals or groups of people who hold an opinion as to whether you would approve or disapprove of carrying out the compliance with pre-operative skin preparation policy"

Code Number	Code	Description of Code
1	Doctor	Doctor and Physician
2	Head nurse	Head nurse
3	Charge nurse	Charge nurse
4	Colleagues	Work colleagues, colleagues, friend
5	Patient	Patient
6	Patient's family	Patient's relatives

Table 3.5: PBC "Items that may enable you carry out the compliance with pre-operative skin preparation policy"

Code Number	Code	Description of Code
1	Support/ Encouragement	Receiving support or encouragement from someone specifically, i.e. doctor, head nurse or charge nurse. Receiving support or encouragement from administration including Nursing or Hospital. Receiving support or encouragement in general.
2	Experience	Comments related to an experience, including background, competence etc.
3	Financial	Comments related to any kind of financial issue such as payment, salary, income etc.

Table 3.6: PBC "Items that may prevent you carrying out the compliance with pre-operative skin preparation policy"

Code Number	Code	Description of Code
1	Lack of equipment	Not being able to follow due to lack of availability of such equipment.
2	Nursing shortage	Lack of nursing resources.
3	Workload	Not being able to follow due to no time, or any issue related to heavy duty loads.
4	Time	The issue of time, time consuming.
5	Patient's privacy	Patient's privacy makes following the policy difficult because usually patients refused.

3.4.12 Reliability

Reliability analysis is usually used to assess the properties of measurement items and scales, and the relationships between individual items in the scales, to ensure the same results in terms of accuracy (Polit & Beck 2004). The reliability of the coding frame was assessed by computing the inter-rater reliability on the development of categories, using a second researcher who coded each participant's response in order to ensure the trustworthiness of findings, including consistency checks (Downing 2003; Trochim et al. 2008). In this study, to test the inter-rater-reliability of the coding frame, SPSS version 21 was employed in two attempts. In the first attempt, the inter-rater-reliability between the two researchers (i.e. the researcher and a member of his supervision team), was 0.78, which is considered unsatisfactory because there were errors found in the coding process of the second researcher. Later, these errors were discussed with the second researcher and the coding document was reviewed. During the second attempt, these errors were corrected and re-calculated. As a result, the inter-rater-reliability was improved from 0.78 to 0.95. Therefore, this result was considered excellent and no further alternatives to the coding frame were felt necessary. In addition, a graphic of the simple scatter plot was used in the inter-rater-reliability that shows a strong degree of concordance between paired data of the two researchers (Figure 3.1).

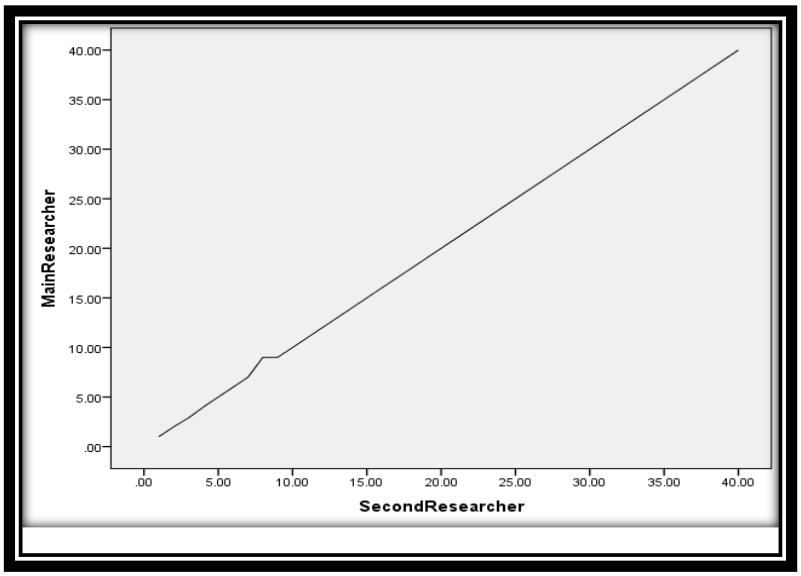


Figure 3.1: The relationship between the results of the coding frame of the researchers

The data analysis involved the following stages:

- Identify the categories for each of the TPB components by reading and re-reading each phrase, sentence and paragraph in the participants' responses in detail and then label the themes extracted (Francis et al. 2004).
- Define each code and develop a coding frame from the list of identified categories.
- Test the reliability of the coding frame.
- Assess the strength and the pattern of the data by creating a graphic of a simple scatter plot, using the SPSS (Figure 3.1).

3.4.13 Results of the elicitation study

The sample of this study consists of the multicultural nursing workforce working at the PSMMC. The questionnaire packs were sent to 50 nurses who had been performing pre-operative skin preparation routines in adult medical surgical units. A final reminder was sent out three days before collecting the locked box. The returned completed survey totalled 47 out of 50, representing a response rate of 94%.

3.4.14 Demographic data

The demographic questions section included: 1-sex, 2- nationality and 3- the awareness of nurses about the hospital's pre-operative skin preparation policy. The majority of study participants were female (85%) and (79%) from the Philippines. 42 respondents indicated that they were aware of the hospital's pre-operative skin preparation policy. However, (5%) of the respondents' responses indicated that they were not fully aware of the hospital's pre-operative skin preparation policy (Table 3.7).

Table 3.7: Demographic characteristics

Demographic data	Categories	Frequency	Percent (%)
Sex	Male	7	15
	Female	40	85
Nationality	Saudi	6	13
	Indian	4	9
	Filipino	37	79
Awareness	Aware	42	90
	Unaware	2	5

Table 3.8: Results of the elicitation study

TBP Component	Categories	Frequency n (%)*
Attitude	Prevent the risk of infection	**40 (86)**
1.1 Advantages of the compliance	Improve quality of patients care	**4 (9)**
	Avoid delay or cancelling the surgical procedure	**3 (7)**
1.2 Disadvantages of the compliance	The chance of getting a skin irritation	**24 (52)**
	Cause skin injury to the patient	**10 (22)**
Subjective Norm	Doctor	**37 (79)**
	Head nurse	**10 (22)**
	Charge nurse	**13 (28)**
	Work colleagues	**4 (9)**
	Patient	**18 (39)**
	Patient's relatives	**9 (20)**
PBC	Support or encouragement	**17 (37)**
3.1 Enable the compliance	Clinical experience	**7 (15)**
	Financial incentives	**5 (11)**
3.2 Prevent the compliance	Lack of equipment availability	**13 (28)**
	Nursing shortage	**9 (20)**
	Workload	**7 (15)**
	Time usage	**6 (13)**
	Patient's privacy	**3 (7)**

* Total sample size is 47

3.4.15 Attitude

Table 3.8 shows the four most common behavioural beliefs (advantages and disadvantages) related to the issue of compliance with pre-operative skin preparation policy. As shown in table 3.8, the majority (86%) of respondents reported that the beliefs in the advantage of compliance led to protecting patients from the risk of infection. The second most reported advantage was the belief that the compliance leads to an improved quality of patients care (9%). In addition, (7%) of participants stated that the belief in the advantage of complying with pre-operative skin preparation policy was to avoid delay or cancellation of the surgical procedure.

With regard to the disadvantages of complying with the pre-operative skin preparation policy, the most frequently reported disadvantages of complying (52%) related to fear of negative side-effects, such as skin irritation, as a result of using protective equipment (i.e. gloves). The findings regarding the disadvantage of complying with the pre-operative skin preparation policy indicated that (22%) of respondents reported that the potential to 'cause skin injury to the patient' was one of the disadvantages associated with positive compliance.

3.4.16 Subjective norm

The participants were then asked to identify the individuals and groups of people they believed held an opinion as to whether they approved or disapproved of complying with the pre-operative skin preparative policy. Clearly, most of participants' responses related to the main categories of healthcare professionals, work colleagues, the patients and their relatives. The most frequently mentioned approving groups, those of 'doctor' (79%), 'head nurse' (22%) and 'charge nurse' (28%), who were mentioned by all participants. Less frequently reported were 'work colleagues' (9%). However, several respondents indicated, in their responses, that this does not mean no one will disapprove the performance of the compliance. The findings show that (39%) of respondents believed that patients will disapprove of the carrying out of the compliance. A further review of table 3.8 indicated that (20%) of the respondents believed that 'patient's relatives' will disapprove of the carrying out of the compliance. Overall, the respondents

indicated that the beliefs of disapproving responses were much lower than those approving of compliance with the pre-operative skin preparation policy.

3.4.17 Perceived behavioural control

In response to the factors that participants believed would enable them to comply with the pre-operative skin preparation policy, ‘receiving support or encouragement’ was the most frequently reported category (37%). Generally, the participants' responses indicated that support or encouragement from a group of people such as healthcare workers, colleagues and the hospital's administrators would raise the level of compliance with the pre-operative skin preparation policy. Moreover, table 3.8 presents the participants' comments such the higher level of clinical experience (15%) and sufficient financial incentives (11%), which were identified as factors that would facilitate the complying with the pre-operative skin preparation policy.

In response to the factors or circumstances that are perceived as being most likely to prevent the participants from carrying out the compliance, it has been shown that 28% of the participants see lack of equipment and 20% see lack of nursing resources as major factors that would prevent them from carrying out the compliance. Participants' comments identified other important factors that would prevent the carrying out of the compliance with pre-operative skin preparation policy: ‘workload’ (15%), ‘time usage’ (13%) and ‘patient's privacy’ (7%).

3.4.18 Discussion

The purpose of the elicitation study was to identify the contents of the model’s salient behavioural, normative and control beliefs that determine the belief structure underlying individuals’ behavioural intentions to comply with the pre-operative skin preparation policy, amongst members of a multicultural nursing workforce in the KSA (Ajzen 1991, 2006; Francis et al. 2004). Based on the recommendations of Ajzen (1991), Ajzen and Fishbein’s (1980) elicitation study was carried out in this current research as the first step in applying the TPB and

as a method of obtained the appropriate attributes of the compliance behaviour for this particular population (Francis et al. 2004). More specifically, this elicitation study identified the participants' beliefs of the advantages / disadvantages of complying with the pre-operative skin preparation policy (behavioural beliefs). The study also identified individuals, or groups of people, that the nurses believed held an opinion as to whether they approved or disapproved of complying with the pre-operative skin preparation policy (normative beliefs). Factors that participants believed would prevent or enable them to carry out their compliance behaviour (control beliefs) were revealed (Ajzen & Fishbein 1980; Ajzen 2006; Puffer & Rashidian 2004).

The findings of the elicitation study showed that the multicultural nursing workforce endorsed a number of beliefs which were similar to previous studies (Dwyer et al. 2005; Levin 1999; Tabak & Ozon 2004; Whitby et al. 2006; Efstathiou et al. 2011; Bischoff et al. 2000; Ahmed et al. 2008; Wandel et al. 2010; Jenner et al. 2002). For example, a large number of responses to question concerning the advantages of complying with pre-operative skin preparation policy yielded a set of most-frequent themes in the behavioural belief domain. For the attitude component, the reflected concerns were about the prevention of risks of infection, improving the quality of patient care and avoiding delay or cancellation of the scheduled surgical procedure. Only two behavioural disadvantages were stated: i) the fear of getting a skin irritation as a result of using protective equipment and ii) causing a skin injury to the patient as a result of complying positively the with pre-operative skin preparation policy (Dwyer et al. 2005). These results show that nurses have different types of positive and negative behavioural beliefs about the compliance behaviour. In similar studies of compliance behaviour beliefs, several researchers (e.g. Rashidian & Russell 2012; Jenner et al. 2002, 2006; Whitby et al. 2006) found that the most important salient beliefs of the advantages and disadvantages of carrying out the compliance related to psychological factors and were similar to the findings identified in this study (O'Boyle et al. 2001; Efstathiou et al. 2011; Darawad et al. 2012). For example, Darawad and colleagues (2012) found that a) prevention from risks of infection, b) the quality of patients' care improvement and c) increased patients satisfaction, were seen as the most important advantages of complying with the prescribed hand washing guidelines (Sauls 2007; Whitby et al. 2006; Godin et al. 2000). In contrast, the elicitation study has shown that nurses

endorsed only a limited number of beliefs, an outcome which is inconsistent with Ajzen and Fishbein's (1980) initial suggestion when forming attitudes; it was proposed that attitudes are determined by eight of the most significant behavioural beliefs. The findings of the elicitation study are more consistent with the view that nurses consider only a limited number of beliefs during attitude creation (Haddock and Zanna 1998). Van der Pligt and Eiser (1984) strongly argued that the TPB model, with its eight beliefs, is not realistic. Overall, due to the limitation of people's capability to information process, nurses considered only five behavioural beliefs during the process of creating specifically focused attitudes (Van der Pligt & Eiser 1984). The findings of the elicitation study consisted of the identification of five behavioural beliefs when the nurses were forming their attitudes about the prescribed compliance behaviour (Puffer & Rashidian 2004; McCarty et al. 2001; Dwyer et al. 2005).

According to the normative beliefs, the elicitation study identified categories of individuals (social referents) and nurses' motivation to comply with the expectations of significant others (Ajzen & Fishbein 1980; Ajzen 2006). Each normative belief is multiplied by the corresponding motivation to comply, and the resulting products are summed across all of the beliefs to provide the total score of the nurses' subjective norm (i.e. normative indirect measure) (Ajzen 2006; Francis et al. 2004). The elicitation study indicated that the most dominant category of belief was related to the normative belief-based measure that a doctor, followed by patient, charge nurses, head nurses, work colleagues and patient's relatives, will hold an opinion as to whether the participants should comply with the pre-operative skin preparation policy (Ajzen & Fishbein 1980; Ajzen 2006; Francis et al. 2004). As previous literature has already described, the doctor and senior nursing personnel (i.e. head nurse and charge nurse) and work colleagues often play important roles in influencing the nurses' compliance (Efstathiou et al. 2011). This finding was not surprising because nurses may be obliged to follow the firm instructions of the doctor, senior nursing personnel and work colleagues. In addition, nurses might be influenced by how a doctor, senior nursing personnel and work colleagues behave and they may even follow their demands towards carrying out the required compliance (Van Rooyen et al. 2010; Nasrabadi et al. 2004; Efstathiou et al. 2011). Dwyer and colleagues (2005) found that the most normative beliefs among nurses, as to who would approve their compliance with the use of defibrillators in their clinical area, were doctors,

senior registered nurses and their colleagues (Godin et al. 2000; Whitby et al. 2006; Ko et al. 2011; Wandel et al. 2010). However, participants identified that patients and their relatives might, or actually would, disapprove of them complying with the pre-operative skin preparation policy. This is due to the potential cultural conflicts arising from nurse-patient interaction, which can be triggered as a result of some nurses having relatively low levels of cultural awareness about Saudi patients (Edward et al. 2001; Almutairi & McCarthy 2012; Van Rooyen et al. 2010; Al-Shari 2002; Halligan 2006; Efstathiou et al. 2011; Javadi et al. 2013; Almutairi et al. 2012; Sauls 2007).

With regard to the control beliefs, in this study, the support/encouragement was the most frequently reported factor, followed by high levels of clinical experience and sufficient financial incentives that would facilitate the complying with the pre-operative skin preparation policy. These findings are consistent with other studies which have shown that the support and encouragement of senior administrators and physicians, for members of the nursing workforce, demonstrated a higher likelihood of their compliance (Dwyer et al. 2005; Lankford et al. 2003; Whitby et al. 2006; Edward et al. 2001; Godin et al. 2008; Nelson et al. 2013). It has been indicated that the higher level of clinical experience, and sufficient financial incentives, were the significant factors that would facilitate the carrying out of the compliance (Al-Ahmadi 2009; Ahmed et al. 2008; Dwyer et al. 2005; Edward et al. 2001; Sauls 2007). However, participants believed that there are certain other factors, such as the non-availability of equipment, lack of time, issue of the patient's privacy, heavy workload and nursing shortages which would prevent them from complying with the pre-operative skin preparation policy (Dilorio1997; Efstathiou et al. 2011; Tabak & Ozon 2004; Whitby et al. 2006; Zhang et al. 2007; Puffer & Rashidian 2004; Perkins et al. 2007; Ko et al. 2011).

3.4.19 Conclusion

In conclusion, the first phase study successfully elicited the modal salient beliefs (e.g. behavioural, normative and control beliefs) about nurses' compliance with the hospital’s pre-operative skin preparation policy. The elicitation study revealed important perceptions regarding the content of these beliefs among the multicultural nursing workforce in the PSMMC at the KSA, which would determine

their attitudes and subjective norms and PBC, to comply with the pre-operative skin preparation policy. The findings of the elicitation study are essential for constructing the standard questionnaires for theory-based instruments to be used in a large-scale quantitative study (i.e. the study of phase two). As recommended by Ajzen (2002) and Francis et al. (2004), the results of the salient behavioural, normative and control beliefs can be used to generate indirect measures of the TPB constructs (i.e. attitude, subjective norm and PBC). Moreover, these findings might be used as a foundation from which to validate direct measures in the TPB (Ajzen 2002; Francis et al. 2004). The next chapter focuses on the development of the TPB constructs by using the findings of the elicitation study to validate measurement items of the TPB, including the behavioural, normative and control beliefs towards complying with the pre-operative skin preparation policy (Ajzen 1991).

Chapter 4: Exploring nurses' beliefs and behavioural intentions to comply with the pre-operative skin preparation policy

This chapter provides sufficient detailed information about phase two of the research (quantitative study), using the findings gathered in phase one (i.e. elicitation study) to develop the TPB questionnaire (Ajzen 2006). In phase two, the quantitative approach was employed, using a self-administered questionnaire to expand understanding of the TPB variables and intentions of compliance with the pre-operative skin preparation policy. The participants were recruited from members of the multicultural nursing workforces in a statistically representative sample (Ajzen 2006; Francis et al. 2004). Tashakkori and Creswell (2008) suggest that the quantitative method is a useful approach to collect, compare and summarise the data, as well as allowing for statistical analyses and generalisation of the results. In this chapter, a description of the research design, questionnaire development, sample strategies, ethical issues, pilot study, process of recruitment, data collection, methods of data analysis and preliminary statistical results are all presented.

4.1 Rationale for research design

In developing this study, a quantitative approach is a suitable research design because it attempts to control for bias so that facts can be illustrated in an appropriate way. In particular this can be achieved by determining and isolating specific variables within the context, seeking correlation, relationships and causality (Tappen 2011; Polit et al. 2001). Phase two is quantitative in nature, including a cross-sectional survey that contributes to the development of constructs and broadens understanding through identifying cross-case patterns with regard to specific issues (Olsen & George, 2004; Burns & Grove, 2011). This current research design was developed, based on the TPB and on the results of the elicitation study (Ajzen, 2002).

In this study, the survey design was used as a method to collect data from the participants. Surveys are used to collect quantitative information about issues in a population; surveys are usually conducted for the general purpose of obtaining information about certain behaviour, opinions, intentions, attitudes, as well as the prevalence, distribution, and interrelations of variables and other relevant characteristics of the participants (Knapp 1998; Tashakkori & Creswell 2008). The advantage of the survey technique is in its flexibility, since it is usable for a wide range of participants across the sample selected for the study. The experimental design can be applied to a large sample for many reasons; a survey is a useful methodology for intensive and extensive analysis (Ajzen 2002; Brink & Wood 2001).

A cross-sectional study is known as descriptive research that can used to gather data from participants at one point in time. This technique is simple, highly flexible and useful for examining the nature of phenomena, as well as assessing and identifying variations in dimensions of the TPB variables (attitudes, subjective norms and PBC) (Ajzen 1991; Bryman 1992). More specifically, a cross-sectional survey is an appropriate design to see whether nurses' intentions toward compliance with the pre-operative skin preparation policy are impacted by the TPB variables (Ajzen 2002; Polit & Beck 2004). A quantitative analysis technique was employed to examine the interaction between the psychological factors that predicate the multicultural nursing workforce members' compliance intentions and behaviour (Ajzen 2002). However, the choice of this study design was also made in order to contribute to the generalisability of the findings (Burns & Grove 2011).

4.2 Questionnaire development

The TPB questionnaire was developed based on the guidelines of Ajzen (2006), together with the results of the elicitation study in phase one; the study included all initial measurement items of behavioural, normative and control beliefs (Ajzen 2006). Francis et al. (2004) recommended that, if the TPB study is to understand and evaluate factors contributing to nurses' intentions to comply with the pre-operative skin preparation policy, both direct and indirect measurement of

constructs should be included in the TPB questionnaires. In this study, the TPB questionnaire was constructed in strict adherence to guidelines published by Ajzen and Fishbein (1980), Ajzen (2006) and Francis et al. (2004). Francis and colleagues (2004) recommended that the TPB questionnaires use both direct and indirect measurement methods, in order to provide different assumptions about the underlying cognitive structures. When direct and belief-based variables measure the same construct, the scores are expected to be positively correlated (Francis et al. 2004). Using direct and indirect measurements of the construct is important, so as to determine simple bivariate correlation between them, as well as to confirm the validity of the indirect measures (Ajzen 2006; Ajzen & Fishbein1980; Francis et al. 2004).

Direct measures are general measures of determinants of nurses' attitudes, subjective norms and PBC about their compliance behaviour. Direct measures are overall questions with a standardised wording across behaviours, which directly ask about respondents' perceptions of the construct (Ajzen 2006). For example, questioning nurses about their attitudes toward the idea of compliance behaviour would involve asking: is it valuable or worthless? Direct measures were developed by following the guidelines outlined by Ajzen (2006) and Francis et al. (2004).

On the other hand, indirect measurements of the nurses' constructs include the determinants of attitudes, subjective norms and PBC, which constitute the majority of the belief-based measures that were obtained in the elicitation study, and were selected for inclusion in the quantitative research. For example, the constructs were made explicit by asking nurses about beliefs of compliance behaviour, and then combining the scores, according to theoretical principles, to see whether the attitude is valuable or worthless. Indirect measures are belief-based measures resulting from the elicitation study for all the predictor constructs in the TPB model. All the respondents were asked about what compliance behaviour means, as well as their beliefs about that compliance behaviour (Ajzen 2006). The development of the questionnaire was based on the literature review of the TPB (Ajzen 2002), as well as on the results of the elicitation study, which were used to develop the indirect measures of behavioural, normative and control beliefs. An example item is as follows: "My

following pre-operative skin preparation policy would prevent patients from the risk of infection".

In order to ensure construct validity, the questionnaire for this study included both direct measures of behavioural intentions, attitudes, subjective norms and PBC, as well as indirect measures of behavioural beliefs, normative beliefs and control beliefs (Ajzen 2006). As recommended by Ajzen (2006) and Francis et al. (2004), both direct and indirect measurements were included in the questionnaire for this study, so making sure higher construct validity will be established, and variance in the dependent variable (intention) will be explained. The items of direct measurement for all constructs (i.e. attitudes, subjective norms, PBC and intention) were based on the procedures described by Ajzen (2006), Ajzen and Fishbein (1980) and Francis et al. (2004). The items of indirect measurement were developed from the results of the elicitation study used in the first phase of this research. The items of indirect measurement were constructed for each determined behavioural belief and its outcome evaluation; each normative belief and the motivation to comply with it; and each control belief and its power (Ajzen 2006; Ajzen & Fishbein1980). All items are measured by using a seven-point scale (e.g., strongly disagree to strongly agree) recommended by the most recent literature using the TPB (Francis et al. 2004; Ajzen 2006). The format of this scale is based on the sematic differential concept, which found the seven-point scale to be optimal for use in TPB studies (Ajzen 2006).

4.2.1 Direct measures

Behavioural intention reflects the person's perceived likelihood to perform a given behaviour, which can be operationalised by direct questions in order to measure relative strength of intention (Ajzen 1991).There were three questions developed to obtain a measure of the strength of behavioural intentions. According to Ajzen (2006), an adequate internal consistency can be demonstrated using intention questions, an approach used by Armitage and Conner (2001). The wording of items is developed based on the published guidelines of Ajzen (2006) and Francis et al. (2004) regarding the questionnaires of the TPB. Ajzen (2006) recommended the questionnaire criteria contain at least three measures to represent the behavioural intention. The statements requiring a response are "I intend to follow

the pre-operative skin preparation policy", "I plan to follow the pre-operative skin preparation policy" and "I am determined to follow the pre-operative skin preparation policy". In addition, standard scaling procedures were used to construct measures. All items were measured by using a seven-point scale ranging from *strongly disagree* to *strongly agree*, and items measuring various constructs are interspersed (Ajzen 2006; Francis et al. 2004). In this present study, the participants' actual behaviour was not measured or observed.

Attitude refers to positive or negative evaluation of carrying out the behaviour. The direct measure assesses participants' attitudes towards the behaviour, revealing whether they believe carrying out the behaviour would be *bad* to *good* (Ajzen & Fishbein 1980). As recommended by Ajzen (2006), in order to improve internal consistency of the direct measures, items were developed based on a specific behaviour. The direct measure of attitudes involves the use of four adjectives pairs: *bad-good*, *useless-useful*, *harmful-beneficial* and *unpleasant-pleasant* (Ajzen 2006), which were preceded by a single statement, "For me, following pre-operative skin preparation policy would be". All items were measured by using a seven-point scale (Ajzen 2006; Francis et al. 2004). This method of using established measures that have proven reliability, as in a previous study conducted by Puffer and Rashidian (2004), is considered as one way to ensure the current study's reliability (Ajzen 2006).

The direct measurement of *subjective norm* assesses the respondents' perception of how important people are to them, in order to carry out or not carry out the behaviour (Ajzen 2002). Three items were developed to obtain the direct measure of subjective norm. These items are: "Most of the people who are important to me think that I…follow the pre-operative skin preparation policy", which was measured by using a seven-point scale ranging from *should not* to *should*. "It is expected of me that I follow the pre-operative skin preparation policy". This item was measured by using a seven-point scale ranging from *extremely unlikely* to *extremely likely*. "The people in my life whose opinions I value would …. of my following pre-operative skin preparation policy ", which was measured by using a seven-point scale ranging from *strongly disapprove* to *strongly approve* (Ajzen 2006).

The direct measure of *perceived behavioural control* is identified by asking questions about individuals' perceptions of their ability and their controllability to perform a given behaviour (Ajzen 2002). According to the guidelines of Ajzen (2006) and Francis et al. (2004), four items were developed to assess the respondents' perceived capability and their beliefs about controllability. These items include: "I am confident that I could follow the pre-operative skin preparation policy", which was measured by using a seven -point scale ranging from *strongly disagree* to *strongly agree*. "For me, to follow the pre-operative skin preparation policy would be", which was measured by using a seven -point scale ranging from *difficult* to *easy*. "How much control do you believe you have over following pre-operative skin preparation policy?" which was measured by using a seven-point scale ranging from *no control* to *complete control*. "Whether or not I follow the pre-operative skin preparation policy is completely up to me", which was measured by using a seven-point scale ranging from *strongly disagree* to *strongly agree* (Ajzen 2006).

4.2.2 Indirect measures

The indirect measurement of attitude is determined by beliefs that developed, based on the items of the most salient beliefs obtained from an elicitation study (i.e. phase one of this research), and evaluations that perceived outcomes of each belief (Ajzen 2006). According to Francis and colleagues (2004), the behavioural beliefs toward complying with pre-operative skin preparation policy, as well as outcomes evaluations, are multiplied together to represent belief evaluation compounds. These belief compounds are then added to create a behavioural beliefs variable. Attitude toward the Act's antecedent is behavioural beliefs (Ajzen 1991). In this study, salient belief measures were calculated by multiplying each behavioural belief with relevant outcome evaluation, and then treating each variable as an individual belief (Ajzen 2006). Five items were developed in the final questionnaire: "prevent risk of infection", "improve quality of patients' care", "avoid delaying or cancelling the surgical procedure", "cause skin injury to patient" and "getting a skin irritation". The belief and evaluation labels were not provided in the final questionnaire. The following is an example of an advantage listed for complying with pre-operative skin preparation policy and the outcome

evaluation question is asked in correspondence with each belief in the questionnaire.

Behavioural beliefs strength

"My following pre-operative skin preparation policy would prevent patients from the risk of infection".

Strongly disagree	1	2	3	4	5	6	7	*Strongly agree*

Outcome evaluation

"Preventing patients from the risk of infection is"

extremely bad	1	2	3	4	5	6	7	*extremely good*

As shown from the above examples for a behavioural belief item, the strength of response to the item was measured by using a seven-point scale ranging from *strongly disagree* to *strongly agree*. After answering an item about the likelihood of complying with pre-operative skin preparation policy, participants were asked to assess the same belief of each outcome evaluation item, which was measured by using a seven-point scale ranging from *extremely bad* to *extremely good* (Ajzen 2006).

Indirect measurement of *subjective norms* is determined by the most salient beliefs about normative expectations of important referents. The strength of each normative belief is weighted by motivation to comply with the referent in question, and the products are aggregated (Ajzen & Fishbein 1980). A normative belief is the individual's belief about what important referents think he or she should or should not carry out the compliance (Ajzen 1991). Motivation to comply represents the individual's willingness to do what the referent thinks he or she should do (Ajzen 1991).The final questionnaire regarding normative belief and motivation to comply separated these two variables, as used by Ajzen (2006) and Francis et al. (2004). The normative beliefs were assessed in the elicitation study, which showed that six referents: doctors, head nurses, charge nurses, colleagues, patients and patients' relatives would think that the respondents should comply with pre-operative skin preparation policy. The following is example of a referent identified from the elicitation study, regarding the behaviour of complying with

the prescribed pre-operative skin preparation policy. This example assumes that a doctor is listed as one of the referents under question.

Normative belief strength

"**Doctors think that I**

Should not	1	2	3	4	5	6	7	*Should*

follow the pre-operative skin preparation policy".

Motivation to comply

"When it comes to following pre-operative skin preparation policy, how much do you want to do what your doctors think you should do?"

Not at all	1	2	3	4	5	6	7	*Very much*

As shown in above example, the strength of a normative belief item was measured by using a seven-point scale ranging from *should not* to *should* (Ajzen 2006). At same time by answering this question, participants indicated the strength of motivation to comply with each referent group or individual. This item was measured by using a seven-point scale ranging from *not at all* to *very much* (Ajzen 2006).

The indirect measurement of *perceived behavioural control* is determined by control beliefs that were obtained from an elicitation study, and perceived power to prevent or facilitate the performance of behaviour evaluations, based on the perceived outcome of each belief in question (Ajzen 1991, 2006). In the elicitation study, open ended questions were used to construct a list of the modal salient beliefs, which represent the most repeatedly mentioned control beliefs about compliance behaviour (Ajzen 1991). Eight items constituted the majority of control beliefs that were determined by the elicitation study; these include support and encouragement, financial, clinical experience, patients' privacy,

workload, equipment availability, nursing shortage and time usage. The following is an example of a control belief and a perceived power question.

Control belief strength

"I expect that my following pre-operative skin preparation policy would require support and encouragement to follow pre-operative skin preparation policy".

Strongly disagree	1	2	3	4	5	6	7	*Strongly agree*

Perceived power

"Support and encouragement would make it _____for me to follow pre-operative skin preparation policy"

Much more difficult	1	2	3	4	5	6	7	*Much easier*

As with behavioural beliefs and normative beliefs, control beliefs were calculated by multiplying each control belief with relevant perceived power, and then treating each variable as an individual belief (Ajzen 2006; Francis et al. 2004). To assess control belief items, respondents were asked to evaluate the effect of control beliefs by using a seven-point scale ranging from *strongly disagree* to *strongly agree* (Ajzen 2006). Meanwhile, these items were identified to measure perceived power by using a seven-point scale ranging from *much more difficult* to *much easier* (Ajzen 2006).

4.3 Study hypothesis

The overall purpose of this study is to assess the TPB model in explaining and predicting the intentions of the multicultural nursing workforce to comply with the pre-operative skin preparation policy. Although there have been no previous studies of compliance with nursing policies and procedures in the KSA, it is important to explore the attitudes, subjective norms and PBCs in understanding

nurses' behavioural intentions towards their compliance behaviour. Based on the suggested theoretical framework and related literature, this study included specific hypotheses as follows:

1. There will be a significant relationship between the TPB constructs (attitude, subjective norm and PBC) and the multicultural nursing workforces' intentions to comply with the pre-operative skin preparation policy.
2. There will be a significant relationship between behavioural beliefs about complying with the pre-operative skin preparation policy and attitudes toward the compliance.
3. There will be a significant relationship between normative beliefs toward complying with the pre-operative skin preparation policy and subjective norms about the compliance.
4. There will be a significant relationship between control beliefs toward complying with the pre-operative skin preparation policy and PBC about the compliance.

4.4 Method

4.4.1 Research setting

This study was conducted at PSMMC in the KSA. The target population was the multicultural nursing workforce located at PSMMC. The total accessible population includes 750 registered nurses performing pre-operative skin preparation routines in adult medical surgical units. English is the official language among all healthcare professionals at PSMMC, including nurses (PSMMC 2009).

4.4.2 Sample strategies

The aim of the quantitative research in the second phase of this study is, as the result of a robust investigation, to be able to generalise a result from the research sample to the population; a convenience sample should be taken in order to maintain participants' anonymity (Burns & Grove 2011). A convenience sample is

easy and accessible; is easy to obtain a sufficient number of participants who meet the inclusion criteria and who are known to be cooperative, and it is not particularly time consuming in the context of this design (Burns & Grove 2011). Although nurses in PSMMC generally work 12 hour shifts (PSMMC 2006), a convenience sampling method can attempt to approach nurses on various days and at different times (Morse 1991). Therefore, a convenience sampling technique was employed because of its wide usage and the relative simplicity of implementation and membership recruitment (Polit et al. 2001).

4.4.3 Sample criteria

The sample was selected from members of the accessible population and was made up of those nurses who met the inclusion criteria (Tappen 2011). In addition, the inclusion and exclusion criteria are the same as those used in the first phase study.

4.4.4 Sample size

Sample size is normally under the control of the researcher, and it significantly affects statistical power. In a balanced study design, power is required to determine the sample size ***n***, which gives power for a specific effect size. Polit and colleagues (2001), argued that most quantitative studies used samples of convenience of less than 200 participants, and several studies include fewer than 100 participants (Kline 2011; Worthington & Whittaker 2006).

According to Thomas and Nelson (2001), the value of the effect size is a standardised measure calculated by dividing the difference in means by the standard deviation. Prajapati and colleagues (2010) suggested that it can be determined either based on data from previous studies or by conducting a pilot study. However, when a power analysis is performed, 0.80 is the minimum power that is considered acceptable (Polit & Beck 2010). Based on the statistical analysis of this study, a power analysis was computed in order to identify the sample size essential for small, medium and large effect sizes, with values of 0.02, 0.15 and

0.35 respectively (Cohen 1992). The recommendations of Cohen (1992) indicated that the sample size in behavioural studies is computed from a medium effect size of (f^2) 15% with power of 80% and alpha 0.05. A power analysis using G*Power version 3.1.7, which is a freeware statistical programme, was employed to determine the sample size (Faul et al. 2009).

In this study, the proposed design includes seven of the TPB variables, and following the recommendation by Cohen (1992), the power analysis revealed that 103 participants were required in order to have 80% power to detect an effect size of 15% and alpha 0.05. However, to allow for 15% attrition, the sample size was increased to 120 participants (Grove et al. 2013). This choice was thought reasonable to demonstrate a moderate effect size for TPB studies using a multiple regression method, which has been used in similar studies (Molloy et al. 2012; Swanson & Power 2004; McMinn et al. 2011; Armitage & Conner 2001). In contrast, the number of participants far exceeded the required minimum sample size, as determined by the statistical power analysis model recommended by Francis et al. (2004), which indicated that TPB studies need a sample size of at least 80 participants to obtain a moderate effect size (Cohen 1988; Kelley et al. 2003; Salant & Dillman1994). Therefore, 240 questionnaires were sent out to obtain a minimum response rate of 50% to achieve the required sample size of 120 participants (Francis et al. 2004). These were sent out in two batches of 120 participants' packs.

4.4.5 Pilot study

Undertaking a pilot study prior to conducting the final study is a highly significant way to refine the research questionnaire and thereby make improvements that would benefit the researcher in the final data analysis (Mason & Zuercher 1995). The pilot study questionnaire was based on Ajzen's (2006) TPB constructs obtained as themes from analysis of the elicitation study: behavioural, normative and control beliefs (Francis et al. 2004). All questionnaire items were developed for outcome evaluation of behavioural beliefs, motivation to comply with referents and control belief power (Ajzen 2006). The rationale for conducting a pilot study was to assess the content validity of the questionnaire's wording, clarity, readability and to evaluate the anticipated response rate in the actual

study (Bowling 2002; Tashakkori & Teddlie 1998). Azjen (2006) suggested that the pilot study is necessary to check the reliability and internal consistency of the measurement scales in the survey questionnaire (i.e. attitude, subjective norm, PBC and intention toward compliance behaviour) (Francis et al. 2004), as well as to assess the initial set of scales selected for phase two of the study (Ajzen 2006). Therefore, a pilot study was conducted involving a small-scale version of the main study; similar participants were selected to those included in the actual study, in order to improve the questionnaire (Francis et al. 2004).

The pilot study selected 20 qualified registered nurses working in adult medical surgical units in the PSMMC as a convenience sample, in order to test the questionnaire's suitability (Lee et al. 2010; Ajzen 2006). The pilot study included the same questions as in the main research, and was designed to shed light on any issues that may improve the clarity of the questions. The pilot study followed the same governance procedures and participants are given the same information as in the main phase of the study. Overall, the results of this pilot study contributed to reducing the chance of survey fatigue and increasing the quality of the survey instrument (Ajzen 2006; Francis et al. 2004). However, taking into account the results of the pilot study, no changes needed to be made to the main study's questionnaire.

4.4.6 Questionnaires

The questionnaires consisted of two parts. The first contained demographic variables including age, gender, nationality, level of education and years of experience. The second part contained 49 questions to quantify the direct and indirect measures of the TPB components. These questions were to measure nurses' intentions to carry out the compliance behaviour (dependent variable), as well as to measure their attitudes toward the compliance behaviour, subjective norms and PBC (independent variables). The development of these items was informed by the procedures described by Ajzen and Fishbein (1980), Ajzen (2006) and Francis et al. (2004). Each item in the second part of the questionnaire involved seven-point scales with scores (Ajzen 2006). A pilot test of the questionnaire was conducted to ensure the validity of the questions' wording and response scale format, and to assess the reliability of the instrument regarding

the TPB constructs (i.e. attitude, subjective norm and PBC) (Montano & Kasprzyk 2008). Based on the results of the pilot study, there were no changes to be made to the final study's questionnaire.

4.4.7 Recruitment

The second research phase followed the same recruitment procedure as the first phase. The recruitment strategy included criteria for screening eligible participants, the number of people to be recruited, the place and the method of data collection to be used. However, as this phase involved the exploration of a different set of concepts, there was a limited risk of biasing the result (Clark et al. 2008). In this study, the Nursing and Research Departments at PSMMC assisted, supported and allowed access to recruit participants and collect data, based on the sampling strategy, including participant criteria, according to standard procedures at PSMMC. In the preparation process to access the field, the researcher conducted a presentation for senior nursing managers to outline the purpose and significance of the study, as well as the process of the study. They acknowledged the significance of the study and they were keen to support it. The hospital's Nursing Administration Department invited nurses to participate and provided an anonymous questionnaire pack containing an invitation letter, participants' information sheet that explains the purpose and procedure of the study and a copy of the questionnaire (Appendices I, J, K & L). Those interested in taking part in the study were asked to return the completed questionnaires in a private envelope, which they could drop into a locked box in the Nursing Administration office. The approximate time to complete the questionnaire was 15 to 20 minutes. In order to obtain a sample size of 120 participants, the recruitment process was administered by sending out self-completion questionnaire packs in two batches to improve the response rate. The first batch included 120 questionnaire packs that were sent out to the clinical areas, and then after four weeks a second batch of 120 questionnaire packs, were distributed to the same population.

4.4.8 Data collection

The data for the quantitative study were collected using structured closed-ended questionnaires that were developed based on the TPB (Ajzen 2002) and on the results of the elicitation study (Tashakkori & Teddlie 1998; Polit et al. 2001). In this study, the main method for data collection involved asking the participants questions via self-completion questionnaires. According to McColl and colleagues (2001), self-completion questionnaires are the method of choice, which is often dictated by several constraints in health studies. In this research, self-completion questionnaires were used to provide high levels of anonymity and to enable participants to return questionnaires without fear of retribution (Gray 2009; Hill et al. 2003). The data were collected within two months; however the Nursing Administration in PSMMC provided a general follow-up through a meeting and a memorandum, which improved the response rate in that more questionnaires were handed in. Furthermore, a final reminder was sent out three days before the locked box was collected by the researcher.

4.4.9 Validity and reliability

The content validity was considered by receiving feedback to enable a comprehensive revision of the questionnaire; comments were received from experts, consultants and researchers in the nursing field, who reviewed the pilot questionnaire (Knapp 1998). In this study, the guidelines for conducting the TPB studies that were developed by Ajzen and Fishbein (1980), Ajzen (2006) and Francis et al. (2004) have been followed in order to ensure construct validity of the questionnaire. For example, the elicitation study was conducted to determine the salient beliefs of a multicultural nurses' workforce about compliance with pre-operative skin preparation policy, using a survey containing an open-ended questionnaire. The results of the elicitation study were used to develop the indirect measures of the TPB model, along with direct measures of behavioural intention, attitudes, subjective norm and PBC in the form of a closed-ended questionnaire (Ajzen 2006; Francis et al. 2004). Reliability of the research questionnaire refers to the consistency with which an instrument measures the attribute of interest (Burns & Grove 2011; Polit et al. 2001). Ajzen (2006) recommended that the use of Cronbach's coefficient alpha is significant to assess the internal consistency of the measurement scales in the TPB questionnaire.

Therefore, prior to the final study, a pilot study was conducted using Cronbach's alpha to assess reliability of the internal consistency of the measurement scales in the final study questionnaire, by using the Statistical Package for Social Sciences (SPSS) (Ajzen 2006).The reliability scores indicated that the scales used in this study are satisfactory to measure the TPB constructs (Polit & Beck 2004).

4.4.10 Data analysis

For the purpose of analysing the collected data quantitatively, SPSS software (version 21) was used. Descriptive statistics (frequencies and percentages) were used to present demographic variables and participants' characteristics. The internal consistencies of each of the TPB construct measurements of questionnaire items were verified by calculating Cronbach's alpha (Tappen 2011; Tashakkori & Teddlie 1998; Cherry & Jacob 2005). To determine the strength of relationships among all of the variables, correlation coefficients will be employed (Francis et al. 2004; Tashakkori & Creswell 2008). In this section, multiple regression analysis was used to test the research hypotheses by determining the extent to which the attitudes, subjective norm and PBC variables (independent variables) were able to predict the multicultural nursing workforce's intentions to comply with the pre-operative skin preparation policy.

4.4.11 Preliminary analysis

4.4.11.1 Data type

When selecting a statistical method, it is essential to understand how the data to be analysed were measured (Polit et al. 2001). There are different scales for data measurement, including nominal (or categorical), ordinal, interval and ratio (Polit et al. 2001). In nominal data, values are assigned to code labels using numbers to categorise characteristics. For example, gender, age and blood type are variables that are measured nominally. Ordinal data values can be ranked and put in order. At the quantitative level, the item is quantified and represented by a numeric value. An ordinal data example will include ranking (e.g. attitudes measured on a seven-point scale thus: 1=extremely bad;2= quite bad; 3=slightly bad;4=neither;5=slightly good;6=quite good; and 7= extremely good). Interval-

scaled data is rank-ordered on a scale that has the same distances between values. For example, calendar dates and temperature degrees in Fahrenheit. Ratio-scaled data provides a true meaningful zero point (e.g. weight, time and length) (Polit et al. 2001; Burns & Grove, 2011). In the data analysis of this study, data of the TPB construct items were measured using ordinal scales; data of the demographic variables were measured using nominal scales. Therefore, it is important to determine the appropriate measurement scales in order to select appropriate statistical analytical techniques. For example, non-parametric analyses are best suited to nominal and ordinal data and parametric analyses are best suited to interval and ratio data (Burns & Grove, 2011; Polit et al. 2001).

4.4.11.2 Analyses using the direct and indirect measures

Prior to data analysis, all variables were prepared consistent with the guidelines recommended by Ajzen (2006) and Francis et al. (2004). The TPB construct items were arranged so that the scale endpoints were a mix of positive and negative, so as to minimise the risk of response bias (Puffer & Rashidian 2004). Although it has been shown that the majority of TPB studies have used a seven-point scale format, Ajzen (1991) has suggested that the different format of a bipolar scale (-3 to +3) would be more sensible and the interpretation of scores is easier when the mid-point of the scale is zero, which consisted of positive and negative poles. In addition, a bipolar scale is associated with more accurate descriptions with two dimensions, instead of one pole of the dimension only; a model which is expected to prevent idiosyncratic interpretations by the respondents (Schwiezer et al. 2011). This suggestion was supported by Francis et al. (2004), who argued that a bipolar scale would make variables more comprehensible for the researchers to ultimately discover whether the final score represents an influence for or against performing the compliance behaviour (Ajzen 2006). Several researchers strongly prefer to use items on bipolar scales to ensure clarity, maximise face validity and consistency in questionnaire items (Francis et al. 2004; French & Hankins 2003; Valois & Godin 1991). According to the standard questionnaire guidelines of Ajzen and Fishbein (1980), it is recommended that responses to items be obtained on a bipolar scale, rating from -3 to +3 (Ajzen 2006; Francis et al. 2004).

Following Ajzen (1991), behavioural intention items were measured directly via three questions. The responses to these items were re-coded on bipolar scales (-3 to +3) in the final analysis (Table 4.1). The mean of the behavioural intention item scores was calculated.

Table 4.1: Behavioural Intention Scale Items (1-3)

I intend to follow the pre-operative skin preparation policy:								
	Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree
I plan to follow the pre-operative skin preparation policy:								
	Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree
I am determined to follow the pre-operative skin preparation policy:								
	Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree

Direct attitude items were re-coded in the SPSS software analysis on the scale -3 to +3; thus the higher numbers reflect a positive attitude to compliance behaviour, and mean was calculated for overall attitude toward the compliance behaviour (Table 4.2). This method of using established measures that have proven reliability in past research is recommended by Puffer and Rashidian (2004) as one way to help ensure reliability.

Table 4.2: Direct Measure: Attitude Scale Items (4-7)

For me, following pre-operative skin preparation policy would be:								
Bad	-3	-2	-1	0	1	2	3	Good
Useless	-3	-2	-1	0	1	2	3	Useful
Harmful	-3	-2	-1	0	1	2	3	Beneficial
Unpleasant	-3	-2	-1	0	1	2	3	Pleasant

For indirect measurement items of attitude, each behavioural belief, the belief score on the strongly disagree-strongly agree scale was multiplied by the relevant evaluation score on the extremely bad-extremely good scale. The questionnaire items were re-coded in SPSS software analysis on a scale of -3 to +3 in the final analysis, thus, the higher numbers on the right side of the questions reflected positive beliefs or evaluation toward the compliance behaviour. The resulting products were summed to create an overall attitude score (Ajzen 2006; Francis et al. 2004) (Table 4.3).

Table 4.3: Indirect Measure: Behavioural Belief and Evaluation Scale Items (8-17)

(Behavioural Belief 1) My following pre-operative skin preparation policy would prevent patients from the risk of infection:							
Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree
(Evaluation of Belief 1) Preventing patients from the risk of infection is:							
Extremely bad	-3	-2	-1	0	1	2	3	Extremely good
(Behavioural Belief 2) My following pre-operative skin preparation policy would improve quality of patients care:							
Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree
(Evaluation of Belief 2) To me, improving quality of patients care is:							
Extremely bad	-3	-2	-1	0	1	2	3	Extremely good
(Behavioural Belief 3) My following pre-operative skin preparation policy would avoid delaying or cancelling the surgical procedure:							
Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree
(Evaluation of Belief 3) Avoiding delay or cancelling the surgical procedure is:							
Extremely	-3	-2	-1	0	1	2	3	Extremely

bad							good
(Behavioural Belief 4) Following pre-operative skin preparation policy may cause skin injury to the patient:							
Strongly disagree	-3	-2	-1	0	1	2	3 Strongly agree
(Evaluation of Belief 4) To me, causing skin injury to the patient as result of following pre-operative skin preparation policy is:							
Extremely bad	-3	-2	-1	0	1	2	3 Extremely good
(Behavioural Belief 5) My following pre-operative skin preparation policy using protective equipment (i.e. gloves) would increase my chance of getting a skin irritation:							
Strongly disagree	-3	-2	-1	0	1	2	3 Strongly agree
(Evaluation of Belief 5) To me, increasing my chance of get a skin irritation is:							
Extremely bad	-3	-2	-1	0	1	2	3 Extremely good

Direct subjective norm items were re-coded in SPSS software analysis on a scale of -3 to +3 in the final analysis, thus, the high scores on the right side of the questions consistently reflect greater social pressure towards performing the compliance behaviour. The mean was calculated for an overall subjective norm score (Ajzen 2006; Francis et al. 2004) (Table 4.4).

Table 4.4: Direct Measure: Subjective Norm Scale Items (18-20)

Most of the people who are important to me think that I							
Should not	-3	-2	-1	0	1	2	3	Should
follow the pre-operative skin preparation policy.							
It is expected of me that I follow the pre-operative skin preparation policy.							
Extremely unlikely	-3	-2	-1	0	1	2	3	Extremely likely
The people in my life whose opinions I value would							
Disapprove	-3	-2	-1	0	1	2	3	Approve
of my following pre-operative skin preparation policy.							

For indirect measurement items of the subjective norm, each normative belief score was multiplied by the score relating to the *not at all* or *very much* scale. The questionnaire items were re-coded in SPSS software analysis on a scale of -3 to +3 in the final analysis, thus, the higher numbers on the right side of the questions reflected a positive belief toward the compliance behaviour. The high scores reflect higher social pressure to perform the compliance behaviour. The resulting products were summed to obtain an overall subjective norm score (Ajzen 2006; Francis et al. 2004) (Table 4.5).

Table 4.5: Indirect Measure: Normative Belief and Motivation to Comply Scale Items (21-32)

(Normative Belief 1) Doctors think that I								
Should not	-3	-2	-1	0	1	2	3	Should follow the pre-operative skin preparation policy.
(Motivation to comply of Belief 1) When it comes to following pre-operative skin preparation policy, how much do you want to do what your doctors think you should do?								
Not at all	-3	-2	-1	0	1	2	3	Very much
(Normative Belief 2) My head nurse thinks that I								
Should not	-3	-2	-1	0	1	2	3	Should follow the pre-operative skin preparation policy.
(Motivation to comply of Belief 2) When it comes to following pre-operative skin preparation policy, how much do you want to do what your head nurse thinks you should do?								
Not at all	-3	-2	-1	0	1	2	3	Very much
(Normative Belief 3) My charge nurse thinks that I								
Should not	-3	-2	-1	0	1	2	3	Should follow the pre-operative skin preparation policy.
(Motivation to comply of Belief 3) When it comes to following pre-operative skin preparation policy, how much do you want to do what your charge nurse thinks you should do?								
Not at all	-3	-2	-1	0	1	2	3	Very much
(Normative Belief 4) My colleagues think that I								
Should not	-3	-2	-1	0	1	2	3	Should follow the pre-operative skin preparation policy.

(Motivation to comply of Belief 4) When it comes to following pre-operative skin preparation policy, how much do you want to do what your colleagues think you should do?							
Not at all	-3	-2	-1	0	1	2	3	Very much
(Normative Belief 5) My patient thinks that I							
Should not	-3	-2	-1	0	1	2	3	Should
follow the pre-operative skin preparation policy.							
(Motivation to comply of Belief 5) When it comes to following pre-operative skin preparation policy, how much do you want to do what your patient thinks you should do?							
Not at all	-3	-2	-1	0	1	2	3	Very much
(Normative Belief 6) The relatives of my patient think that I							
Should not	-3	-2	-1	0	1	2	3	Should
follow the pre-operative skin preparation policy.							
(Motivation to comply of Belief 6) When it comes to following pre-operative skin preparation policy, how much do you want to do what your patient's relatives think you should do?							
Not at all	-3	-2	-1	0	1	2	3	Very much

Direct PBC items were re-coded in SPSS software analysis on the scale of -3 to +3 in the final analysis; thus the high scores reflected a positive on the right side of the questions, as well as a greater level of control over the compliance behaviour. The mean of the item scores was calculated to give an overall PBC score (Ajzen 2006; Francis et al. 2004) (Table 4.6).

Table 4.6: Direct Measure: PBC Scale Items (33-36)

I am confident that I could follow the pre-operative skin preparation policy.							
Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree
For me to follow the pre-operative skin preparation policy would be							
Difficult	-3	-2	-1	0	1	2	3	Easy
How much control do you believe you have over following pre-operative skin preparation policy?							
No control	-3	-2	-1	0	1	2	3	Complete control
Whether or not I follow the pre-operative skin preparation policy is completely up to me.							
Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree

For indirect measurement items of PBC, each control belief score on the strongly disagree /strongly agree scale was multiplied by the score relating to relevant items in the *much more difficult/much easier* scale. The control belief questionnaire items were arranged by using the ends of the scales that were a mix of positive and negative endpoints to avoid response set. These items were re-coded in SPSS software analysis on a scale of -3 to +3 in the final analysis; thus, the higher numbers on the right side of the questions reflected a positive belief toward the compliance behaviour. The resulting products were summed to obtain an overall PBC score (Ajzen 2006; Francis et al. 2004) (Table 4.7).

Table 4.7: Indirect Measure: Control Belief and Perceived Power of Control Belief Scale Items (37-53)

(Control Belief 1) I expect that my following pre-operative skin preparation policy would require support and encouragement to follow pre-operative skin preparation policy.

Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree

(Power of Control Belief 1) Support and encouragement would make it

Much more difficult	-3	-2	-1	0	1	2	3	Much easier

for me to follow pre-operative skin preparation policy.

(Control Belief 2) I think that my following pre-operative skin preparation policy would require financial incentives to follow pre-operative skin preparation policy.

Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree

(Power of Control Belief 2) The financial incentives would make it

Much more difficult	-3	-2	-1	0	1	2	3	Much easier

for me to follow for pre-operative skin preparation policy.

(Control Belief 3) I expect that a higher level of clinical experience would enable me to follow pre-operative skin preparation policy.

Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree

(Power of Control Belief 3) For me, a higher level of clinical experience would make it

Much more difficult	-3	-2	-1	0	1	2	3	Much easier

to follow pre-operative skin preparation policy.

(Control Belief 4) I expect that the issue of respecting a patient's privacy would prevent me from following pre-operative skin preparation policy.

Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree

(Power of Control Belief 4) To me, respecting a patient's privacy would make it

Much more difficult	-3	-2	-1	0	1	2	3	Much easier

to follow pre-operative skin preparation policy.

(Control Belief 5) I think that my following pre-operative skin preparation policy would raise my workload by following pre-operative skin preparation policy.

Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree

(Power of Control Belief 5) To me, the workload would make it

Much more difficult	-3	-2	-1	0	1	2	3	Much easier

to follow pre-operative skin preparation policy.

(Control Belief 6) I expect that lack of equipment availability would prevent me from following pre-operative skin preparation policy.

Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree

(Power of Control Belief 6) The lack of equipment availability for the pre-operative skin preparation policy would make it

Much more difficult	-3	-2	-1	0	1	2	3	Much easier

for me to follow pre-operative skin preparation policy.

(Control Belief 7) I expect that nurses' shortage would prevent me from following pre-operative skin preparation policy.

Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree

(Power of Control Belief 7) Nurses' shortage would make it							
Much more difficult	-3	-2	-1	0	1	2	3	Much easier
for me to follow pre-operative skin preparation policy.							
(Control Belief 8) I think that lack of time would prevent me from following pre-operative skin preparation policy.							
Strongly disagree	-3	-2	-1	0	1	2	3	Strongly agree
(Power of Control Belief 8) To me, the time availability would make it							
Much more difficult	-3	-2	-1	0	1	2	3	Much easier
to follow pre-operative skin preparation policy.							

4.4.11.3 Data entry and missing data

Data from the questionnaires were initially entered manually into Microsoft Excel 2010 and variables were coded for entry into a SPSS software analysis. All data entry was screened to check for any possible errors including the coding process, missing values and scale for all variables by a co-researcher from the University of Southampton. Any identified errors or anomalies were to be corrected before data analysis. There were no missing data, and no errors in data entry were found for all 229 participants.

4.4.11.4 Normality

According to Tabachnick and Fidell (2007), the normal distribution test of data is an essential guide as to whether parametric or non-parametric methods of data analysis should be employed. In this study, the normality test of data distribution patterns was assessed by examining each measure using the statistical analysis (e.g. skewness and kurtosis values) and graphical techniques (e.g. histogram) (Polit et al. 2001; Burns & Grove 2011).

Statistically, the variables are normally distributed if skewness and kurtosis values are close to zero (Tabachnick & Fidell 2007). The univariate results for behavioural intention, direct attitude, direct subjective norm and direct PBC were shown in table 4.8. A histogram provides a graphic method of the distribution of a set of data (Tabachnick & Fidell 2007) (Figures 4.1, 4.2, 4.3 & 4.4). Based on both the results of statistics and histograms of all variables, the data were not normally distributed and therefore, non-parametric statistics were considered most appropriate.

Table 4.8: Assessment of Normality of Distributions for Scale Scores

Variable	Skewness (SE*)	Kurtosis (SE*)
Behavioural Intention	-3.237 (0.161)	14.379 (0.320)
Direct Attitude	-3.142 (0.161)	14.592 (0.320)
Direct Subjective Norm	-1.844 (0.161)	3.714 (0.320)
Direct PBC**	-1.957 (0.161)	4.789 (0.320)

* Standard error
**PBC-Perceived Behavioural Control

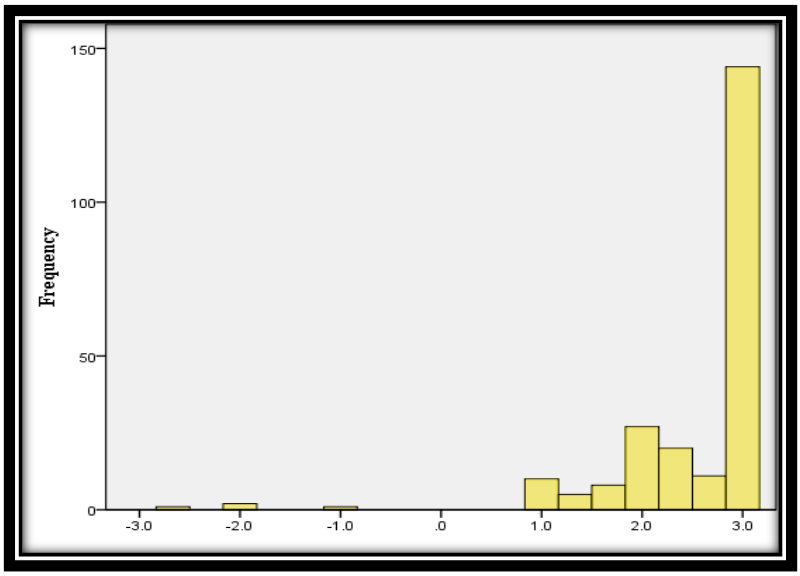


Figure 4.1: A Histogram for Behavioural Intention

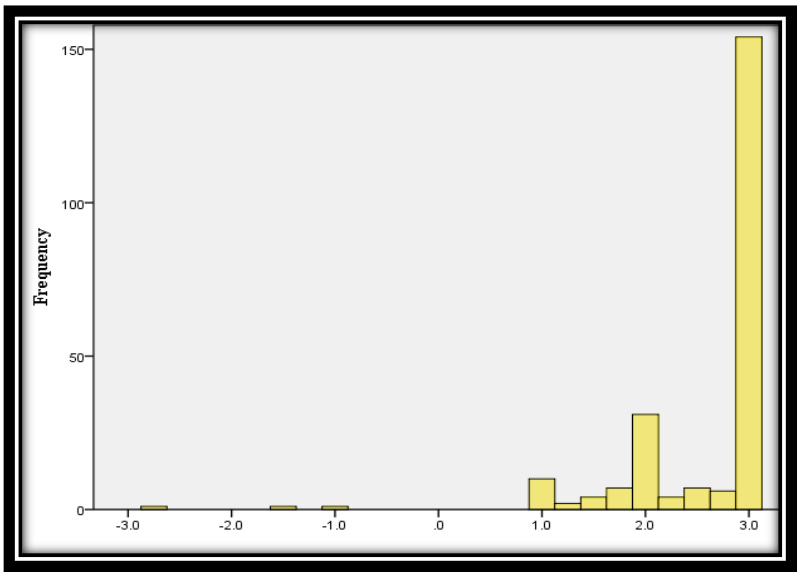


Figure 4.2: A Histogram for Attitude

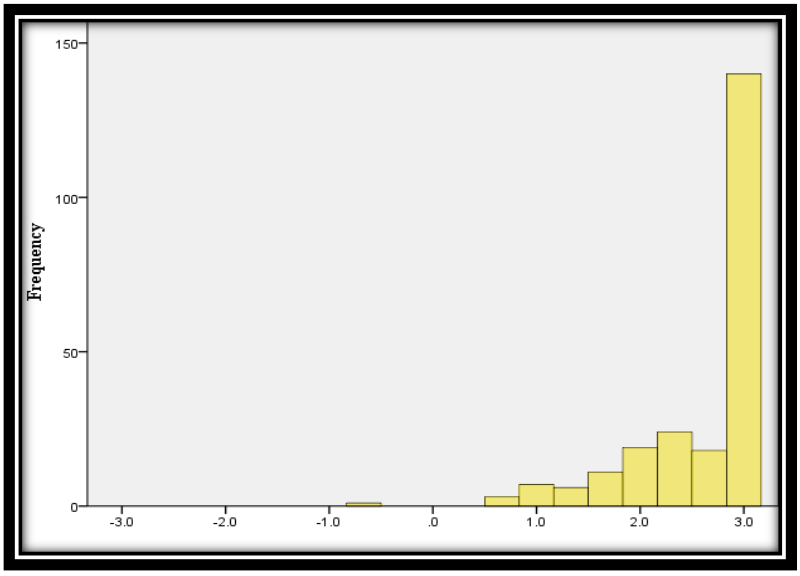


Figure 4.3: A Histogram for Subjective Norm

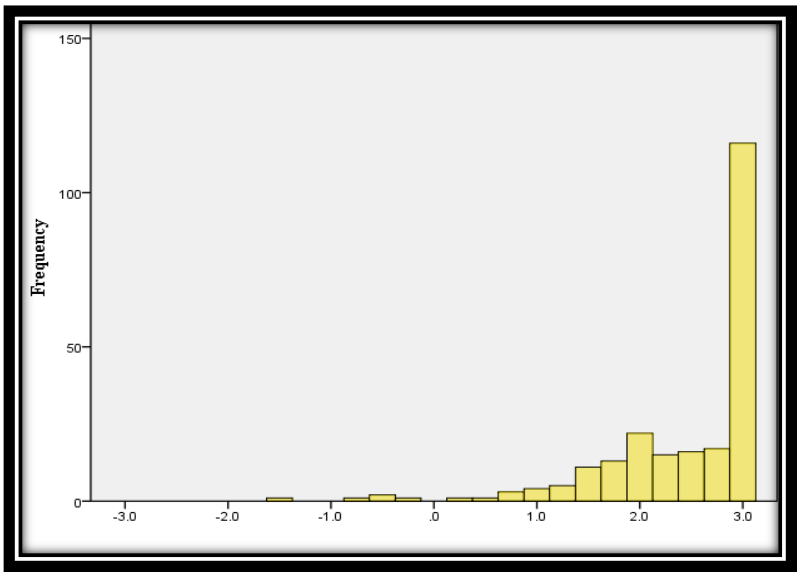


Figure 4.4: A Histogram for Perceived Behavioural Control

4.4.11.5 Testing of the hypotheses

The aim of this study was to explore the utility of the TPB in predicting nurses' behavioural intentions to comply with the pre-operative skin preparation policy (Ajzen 1991). The TPB model and all hypotheses were tested using multiple regression analysis. Due to the data not being normally distributed in the TPB and behavioural intention variables, all hypotheses were examined using non-parametric statistics (Tabachnick & Fidell 2007). A logistic regression analysis was used to test the research hypotheses and the simultaneous impact of each TPB construct (attitude, subjective norm and PBC) in predicting multicultural nursing workforces' intention to comply with pre-operative skin preparation policy. The relationships between behavioural intention (dependent variable) and each TPB component (attitude, subjective norm and PBC) as independent variables were examined (hypothesis 1). Although the TPB variables were predictors of intention to comply with pre-operative skin preparation policy, the significance of the underlying beliefs of the attitude, subjective norm and PBC were examined using logistic regression analysis. Three models of logistic regression analysis were used to test the relationships between the attitudes (hypothesis 2), subjective norms (hypothesis 3) and PBC (hypothesis 4) as dependent variables, and their underlying beliefs as independent variables.

Logistic regression analysis is a popular test in health research used to predict dichotomous variables from a set of predictor variables (Orme & Combs-Orme 2009). When using logistic regression analysis, there is an assumption that should be considered regarding multi-collinearity, which can be problematic for logistic regression models (Field 2009). Multi-collinearity was tested by checking the values of correlation coefficients, tolerance and a variance inflation factor (VIF). Multi-collinearity resulted from two predictor variables that were highly correlated with one another, which if undetected would prevent a predictor variable from reaching statistical significance (Field 2009; Tabachnick & Fidell 2007). A correlation coefficient value of 0.5 or higher, among the independent variables, is considered problematic due to increased variance in the predictor variables (Henderson & Seaby 2008). Field (2005) stated that a tolerance below 0.1 and a VIF greater than 10 may indicate a problem with multi-collinearity (Tabachnick & Fidell 2007). In this study, table 4.9 provides a summary of the collinearity diagnostic data that were obtained from the regression analysis, showing that all independent variables (i.e. attitude, subjective norms and PBC) had tolerance values of more than 0.10, as well as a VIF of less than 10, indicating that there was no multi-collinearity.

Table 4.9: Collinearity Diagnostics

Variables	Tolerance <0.1*	VIF >10*
Attitude	0.74	1.35
Subjective Norm	0.61	1.63
PBC**	0.73	1.37

*Criteria used test multicollinearity
** Perceived Behavioural Control

4.4.12 Results

This section presents the results from data analyses of the second phase study. The first part, the descriptive statistics will be presented including demographic findings. Second, reliability of scale items, based on the TPB model, will be presented. Third, the correlations among the TPB constructs will be analysed. In

the last section, the research hypotheses are examined by using logistic regression analyses.

4.4.12.1 Descriptive statistics

The purpose of this research is to understand the causal relationships among the TPB constructs (Ajzen 1991). Ajzen and Fishbein (1980) argued that some demographic variables might significantly influence nurses' behavioural intentions and behaviour; particularly as represented through attitude, subjective norm and PBC (Ajzen 1991). Due to the limitations of this study, the demographic variables were not included for consideration within the TPB model. While a criticism of the study could be the focus on beliefs to the exclusion of demographic data, the TPB advocates any effect on the compliance behaviour would be mediated by the theory's proximal variable (Fishbein & Ajzen 2005). Further, this study considers the beliefs of a very specific and self-categorised group of registered general nurses, so demographic data are less relevant relative to the TPB model. Consequently, the removal of demographics allowed for more focus on the TPB constructs, which would support deeper exploration of beliefs. However, brief descriptive statistics from the demographic variables are provided in order to understand frequencies of nurses' compliance. In addition, participant demographic frequencies and response rates, including age of participants, gender, nationality, years of experience of participants and level of education of participants were calculated by using SPSS software analysis version 21 (see Table 4.10). A total of 240 questionnaire packets were sent out and a total of 229 questionnaire packets were returned completed, representing a response rate of 95%. Table 4.10 shows the frequencies and percentages of participants according to various demographics. Of the 240 respondents, 175 (76.4%) were female and 54 (23.6%) were male. Most respondents (64.6%) were between 31-40 years of age and the minority were older than 51 years of age (2.6%). 22.7% of the respondents were between 20-30 years of age and 10% of respondents were between 41-50 years of age. Regarding the nationality of respondents, the majority were Filipino (55.9%), followed by Saudi nationality (34.1%). Respondents of Indian nationality were (9.6%), and one participant was Swedish 0.4%. For levels of experience, 109 respondents (47.6%) had between 1-3 years of experience; 60 respondents (26.6%) had between 3-5 years of experience, and 60 participants had more than 5 years of experience (26.6%). As seen in table 4.10, the

respondents had a varied level of education, with most 214 (93.4%) holding a bachelor's degree in nursing. A few participants 10 (4.4%) had a diploma in nursing while 10 (2.2%) participants were holding a Master's degree in nursing.

Table 4.10: Summary of Demographic Frequency Statistic of Respondents (N=229)

Variable	Categories	Frequency	Percent %
Age			
	20-30 Years	52	22.7
	31-40 Years	148	64.6
	41-50 Years	23	10.0
	>51 Years	6	2.6
Total		229	100
Gender			
	Male	54	23.6
	Female	175	76.4
Total		229	100
Nationality			
	Saudi	78	34.1
	Filipino	128	55.9
	Indian	22	9.6
	Swedish	1	0.4
Total		229	100
Years of Experience			
	1-3 Years	109	47.6
	3-5 Years	60	26.2
	>5 Years	60	26.2
Total		229	100
Level of Education			
	Master in Nursing	5	2.2
	Bachelor in Nursing	214	93.4
	Diploma in Nursing	10	4.4
Total		229	100

4.4.12.2 Reliability

Reliability refers to the existing agreement among different measuring attempts, as well as to the consistency or dependability of a measure over time or over questionnaire items, which can assess the properties of measurement scales and items used in the questionnaire survey (Pallant 2005). Cronbach's alpha is a widely accepted way of assessing the internal consistency (reliability) of the scales construct (Tabachnick & Fidell 2007). In health studies, the greater the value of Cronbach's alpha the greater is the reliability of the measurements (Polit & Beck 2010). Cronbach's alpha is used to measure the degree of consistency among the items on a scale, and to assess the reliability of the instrument used in the TPB constructs (Burns & Grove 2011; Francis et al. 2004; Ajzen 2006).

All direct measurement constructs of TPB model (attitude, subjective norm, PBC and behavioural intention) were examined for internal consistency (reliability) using Cronbach's alpha in SPSS software analysis. Francis et al. (2004) consider an alpha coefficient value greater than 0.6 is generally acceptable in statistical analysis. In the final survey, the reliability tests were performed for each summated variable of TPB model, and all had acceptable values. As presented in table 4.11, both the final summated scale of attitude and summated scale of behavioural intention had excellent alpha values of (0.93). The final summated scale of the subjective norm had an acceptable alpha value of (0.72). The final summated scale of PBC had a strong alpha value of (0.80).

Table 4.11: Reliability of Scale Constructs

Scale	Number of Items	Cronbach's Alpha (α)
Intention	3	0.93
Attitude	4	0.93
Subjective Norm	3	0.72
PBC*	4	0.80

*Perceived Behavioural Control

Regarding indirect measures; reliability in indirect measures could not be assessed using an internal consistency criterion because it is possible people can hold both positive and negative beliefs about the same behaviour (Ajzen 2006; Francis et al. 2004; Everitt 1996). Indirect measures of attitudes, subjective norms and PBC beliefs may not necessarily belong to the same content domain. Fishbein (1967) argued that while nurses' attitudes will be highly correlated with an estimate based on consideration of many of their beliefs, it might be uncorrelated or even negatively correlated with any single belief considered in isolation (Francis et al. 2004). For example, table 4.12 indicates two behavioural beliefs in indirect measures of attitude that may be associated with nurses' willingness to comply with the pre-operative skin preparation policy. Therefore, it should not be assumed that responses to these pairs of items would be highly correlated with each other; nor do they necessarily measure the same content domain. Thus, it has been recommended that the concept of internal consistency (alpha reliability) is not appropriate for these indirect measures (Francis et al. 2004).

Table 4.12: Behavioural Beliefs

1. My following pre-operative skin preparation policy would improve quality of patients care.
2. Following pre-operative skin preparation policy may cause skin injury to the patient.

4.4.12.3 Correlation analyses

The correlation coefficient is a commonly used method to test the relationship between variables (Burns & Grove 2011). In this study Spearman's (rho) coefficient correlation, chosen because the data were not normally distributed, was employed to test the strength of the relationships between the TPB variables (attitude, subjective norm, PBC) and the behavioural intention variable. Correlation coefficients range from +1 (reflecting a 100% positive relationship) through 0.0 (for no relationship) to minus1.00 (a totally negative relationship) (Polit & Beck 2004; Polit et al. 2001). According to Ajzen (1991), the correlation analysis is used to assess the validity of the indirect measures' representation of the direct measures (Ajzen 2002).

Table 4.13 presents the Spearman's rho correlations between the direct and indirect measure of TPB constructs and the behavioural intention variable in the model. As shown, the correlations were significantly positive between all direct and indirect measures of attitude ($r=0.39$, $n=229$, $P<0.01$), subjective norm ($r=0.41$, $n=229$, $P<0.01$) and PBC ($r=0.27$, $n=229$, $P<0.01$). In addition, all direct measure TPB constructs were correlated with behavioural intention at a significance level of $P<0.01$. Behavioural intention was significantly and positively correlated with indirect attitude ($r=0.42$, $n=229$, $P<0.01$) and subjective norm ($r=0.31$, $n=229$, $P<0.01$). The indirect measure of PBC was not significantly correlated with behavioural intention ($r=0.12$, $n=229$, $P>0.05$). Table 4.13 shows that there is significant correlation between two of independent variables (i.e. direct PBC and direct subjective norm) ($r=0.61$, $P<0.01$). However, the correlations between the predictor variables in the TPB model, were the mean scale reliability, suggesting that multi-collinearity was not a threat to the stability of the analysis (Field 2009, 2005; Dixon et al. 2008). It was found that both direct measures of the PBC and subjective norm variables were significantly related to the prediction of nurses' high level of behavioural intention when each variable was tested separately (see table 4.13). According to Fox and Monette (1992), multi-collinearity is not a problem if based on examining the absolute correlation coefficients for the independent variables (Field 2005). Consequently, multi-collinearity was not considered to be a serious threat to the stability of the analysis.

Table 4.13: Spearman's Rho Correlation of the TPB Direct and Indirect Measure Constructs and Behavioural Intention

TPB Constructs	Behavioural Intention	Attitude (Direct)	Attitude (Indirect)	Subjective norm (Direct)	Subjective norm (Indirect)	PBC (Direct)	PBC (Indirect)
Behavioural Intention	1						
Attitude (Direct)	0.66**	1					
Attitude (Indirect)	0.42**	0.39**	1				
Subjective norm (Direct)	0.53**	0.52**	0.29**	1			
Subjective norm (Indirect)	0.31**	0.31**	0.26**	0.41**	1		
PBC (Direct)	0.41**	0.40**	0.30**	0.61**	0.27**	1	
PBC (Indirect)	0.12	0.14*	0.12	0.20**	0.32**	0.27**	1

* Spearman's rho correlation is significant at P< 0.05 level (2-tailed).
** Spearman's rho correlation is significant at P< 0.01 level (2-tailed).

4.4.12.4 Test of hypotheses

Logistic regression was performed to test the following research hypotheses:

Hypothesis 1: there will be a significant relationship between the TPB constructs (attitude, subjective norm and PBC) and the multicultural nursing workforces' intention towards complying with the pre-operative skin preparation policy.

For a preliminary analysis, in order to examine the importance of attitude, subjective norms and PBC variables, all data were entered into a logistic regression analysis as independent variables, and with behavioural intention as the dependent variable (Table 4.14). As result of data non-normally distributed,

the predicted behavioural intention variable was transformed into a binary (or dichotomous) dependent variable for the logistic regression analysis. Behavioural intention was operationalised as high behavioural intention, coded (1), which included nurses who reported a behavioural intention of (+3), and non-high behavioural intention, coded (0) for nurses who reported a behavioural intention score of 2.99 or less.

In this hypothesis, the choice of variables was made on theoretical grounds and attitude, subjective norm and PBC were entered into the model in the two phases. This was done in an attempt to better understand the role of these constructs on nurses' behavioural intentions related to complying with the pre-operative skin preparation policy. In the first phase, each construct in the TPB model was tested individually. The TPB direct measures of attitude, subjective norm and PBC were significantly related to behavioural intention. However, only the indirect measures of attitude and subjective norm were significantly related to the behavioural intention variable; the indirect measure of PBC was not so related (see tables 4.14).

In the second phase, all constructs were tested simultaneously, showing that the TPB direct measures model testing the null hypothesis was rejected χ^2 (5, N=229) =21.5, P<0.05. The model explained 40% of variance in the behavioural intention as indicated by the Nagelkerke *R* Square. As seen from table 4.15, both the direct measures of attitude and subjective norm were significantly related to behavioural intention, while the direct measure of the PBC was not (Odds ratio 1.30, 95% CI= 0.81-2.09, P=0.28). As the score for the direct measure of attitude increased by one unit, the likelihood of respondents being high intenders was 3.86 times higher than being a low intender (Odds ratio 3.86, 95% CI= 2.07-7.20, P<0.05). Also, a one unit increase in the direct measure of the subjective norm, increases the likelihood of respondents being high intenders by 3.37 times compare to being low intenders (Odds ratio 3.37, 95% CI=1.71-6.64, P<0.05).

Table 4.14: Logistic Regression Analysis for each individual constructs of the TPB on behavioural Intention

Independent Variables	Coefficient β	Standard Error	Wald Chi-Square	P-Value*	Odds Ratio	95% Confidence Interval for Odds Ratio	
						Lower	Upper
Direct Measures (N=229)							
Attitude	1.85	0.31	36.68	<0.05	6.33	3.49	11.51
Indirect Measures (N=229)							
Attitude	0.10	0.02	28.87	<0.05	1.11	1.07	1.15
Direct Measures (N=229)							
Subjective norm	1.83	0.31	35.47	<0.05	6.21	3.41	11.33
Indirect Measures (N=229)							
Subjective norm	0.04	0.01	12.72	<0.05	1.04	1.02	1.07
Direct Measures (N=229)							
PBC*	0.94	0.21	19.75	<0.05	2.56	1.69	3.87
Indirect Measures (N=229)							
PBC*	0.02	0.01	2.54	**0.11**	1.02	0.99	1.04

* Significance at P<0.05

Table 4.15: Logistic Regression Analysis for the TPB constructs on Intention

Independent Variables	Coefficient β	Standard Error	Wald Chi-Square	P-Value**	Odds Ratio	R2	95% Confidence Interval for Odds Ratio	
							Lower	Upper
Model-1								
Direct Measures (N=229)								
Attitude	1.35	0.32	17.93	<0.05	3.86	0.40	2.07	7.20
Subjective Norm	1.21	0.35	12.29	<0.05	3.37		1.71	6.64
PBC*	0.26	0.24	1.19	**0.28**	1.30		0.81	2.09
Model-2								
Indirect Measures (N=229)								
Attitude	0.09	0.02	23.0	<0.05	1.1	0.22	1.06	1.14
Subjective Norm	0.02	0.01	4.5	0.03	1.02		1.00	1.05
PBC*	0.00	0.01	0.02	**0.88**	1.0		0.98	1.02

*Perceived Behavioural Control
**Significance at P<0.05

In addition, the TPB indirect measures model testing the null hypothesis was rejected χ^2(8, N=229) =25.24, P<0.05. The model explained 22% of variance in the behavioural intention, as indicated by the Nagelkerke *R* Square. Only the indirect measures of attitude and subjective norm were significantly related with behavioural intention. For the indirect measure of attitude, as the score increased by one unit, the likelihood of respondents being high intenders increased by 1.1

times (Odds ratio 1.1, 95% CI=1.06-1.14, P<0.05). In the indirect measure of subjective norm, if the score increased by one unit the odds of a respondent being a high intender increased by 1.02 times (Odds ratio 1.02, 95% CI=1.00-1.05, P<0.05). Table 4.15 shows that the indirect measure of PBC was not significantly related to nurses' behavioural high intention (Odds ratio 1.0, 95%, CI=0.98-1.02, P=0.88), indicating that the addition of the direct and indirect measures of the PBC construct to both TPB models did not significantly improve model prediction. Therefore, these results of direct and indirect measure constructs for attitude and subjective norm provide support for hypothesis 1, but direct and indirect PBC did not (Table 4.15).

Hypothesis 2: there will be a significant relationship between behavioural beliefs about complying with pre-operative skin preparation policy and attitude toward the compliance.

As previously discussed, due to data that were not normally distributed, a logistic regression analysis was used to test the significance of relationships between behavioural beliefs and attitudes. The predicted attitude variable was transformed into a binary (or dichotomous) dependent variable for the logistic regression analysis. Attitude was operationalised as high attitude, coded (1), which included nurses who reported an attitude of (+3), and non-high attitude, coded (0) for nurses who reported an attitude of 2.99 or less. As shown in table 4.16 the model containing all predictors was statistically significant, which explained 52% of the variance in attitude as indicated by the Nagelkerke *R* Square [χ^2 (8, N=229) =13.9, P<0.05]. As shown in table 4.16, three of the independent variables made a unique statistically significant contribution to the model (e.g. prevent the risk of infection, improve quality of care and avoid delaying or cancelling a surgical procedure). The strongest predictor of reporting attitude was *to improve quality of care* (Odds ratio 4.46, 95% CI=1.33-14.99, P=0.02); followed by *prevent the risk of infection* (Odds ratio 4.32, 95% CI=1.45-12.88, P=0.01) and *to avoid delaying or cancelling a surgical procedure* (Odds ratio 1.96, 95% CI= 1.33-2.88, P<0.05). This indicated that respondents who believed that compliance with the pre-operative skin preparation policy would prevent the risk of infection and improve quality of care, were more than four times more likely than other

respondents to hold higher attitudes toward complying with pre-operative skin preparation policy. On the other hand, nurses who believed compliance with pre-operative skin preparation policy would avoid the delay or cancellation of a surgical procedure were approximately two times more likely to hold higher attitudes towards compliance than other nurses

Table 4.16: Logistic Regression Analysis for Behavioural Beliefs in Predicting Attitude

Independent Variables	Coefficient β	Standard Error	Wald Chi-Square	P-Value*	Odds Ratio	R2	95% Confidence Interval for Odds Ratio	
							Lower	Upper
Model								
Prevent the risk of infection	1.46	0.56	6.87	0.01	4.32		1.45	12.88
Improve quality of care	1.50	0.62	5.84	0.02	4.46	**0.52**	1.33	14.99
Avoid delay or cancel the surgical procedure	0.68	0.20	11.71	<0.05	1.96		1.33	2.88
Cause skin injury	-0.08	0.10	0.74	**0.39**	0.92		0.77	1.11
Cause skin irritation	-0.02	0.12	0.03	**0.86**	0.98		0.77	1.24

* Significance at P<0.05

The findings indicated that the behavioural beliefs that considered compliance with the pre-operative skin preparation policy causes skin injury and skin irritation had no independent influence in predicting attitudes towards complying with the pre-operative skin preparation policy (Table 4.16). Therefore, a chi-square value of 13.9, with 8 degrees of freedom, and P<0.05 all indicate that the three independent variables which constitute behavioural beliefs have a

significant influence in predicting attitude to comply with the pre-operative skin preparation policy, which only supported hypothesis 2.

Hypothesis 3: there will be a significant relationship between normative beliefs towards complying with the pre-operative skin preparation policy and subjective norms about the compliance.

In order to test the relationships between the normative beliefs and subjective norms, a logistic regression analysis was used in order to cope with data that were not normally distributed. The predicted subjective norm variable was transformed into a binary (or dichotomous) dependent variable for the logistic regression analysis. Subjective norm was operationalised as high subjective norm, coded (1), which included nurses who reported a subjective norm of (+3), and non-high subjective norm, coded (0) for nurses who reported a subjective norm of 2.99 or less. As indicated in table 4.17, the model containing all predictors was statistically significant, which explained 35% of the variance as indicated by the Nagelkerke *R* Square [χ^2 (8, N=229) =16.4 , P<0.05]. The findings showed that doctors, charge nurses and relatives of patients were significant independent predictors of subjective norms, recording (Odds ratio 2.08, 95% CI=1.18-2.35, P<0.05) (Odds ratio 2.10, 95% CI=1.22-3.62, P<0.05) and (Odds ratio 0.78, 95% CI=0.62-0.99, P=0.05) respectively. These data indicate that nurses with higher levels of normative beliefs were more than twice as likely to hold higher subjective norms towards compliance, than other nurses.

The odds ratio of 0.78 for relatives of patients was less than 1, indicating that respondents who perceived disapproval from relatives of patients, if as nurses they tried to comply with the skin preparation policy, were less likely to hold higher subjective norms towards compliance with the pre-operative policy. However, head nurses, colleagues and patients did not significantly predict subjective norms towards complying with pre-operative skin preparation policy (Table 4.17). Therefore, a chi-square value of 16.4 with 8 degrees of freedom, and P<0.05 all indicate that the three identified independent variables of normative beliefs (e.g. doctors, charge nurses and patients' relatives) have

significant influence in predicting subjective norms to comply with the pre-operative skin preparation policy, which only support hypothesis 3.

Table 4.17: Logistic Regression Analysis for Normative Beliefs in Predicting Subjective Norm

Independent Variables	Coefficient β	Standard Error	Wald Chi-Square	P-Value*	Odds Ratio	R2	95% Confidence Interval for Odds Ratio	
							Lower	Upper
Model								
Doctor	0.51	0.18	8.27	<0.05	2.08		1.18	2.35
Head Nurse	0.21	0.23	0.83	**0.36**	1.23		0.79	1.93
Charge Nurse	0.74	0.28	7.07	<0.05	2.10	**0.35**	1.22	3.62
Colleague	0.19	0.13	2.08	**0.15**	1.21		0.93	1.57
Patient	-0.18	0.12	2.21	**0.14**	0.83		0.66	1.06
Relatives of Patient	-0.25	0.12	3.97	0.05	0.78		0.62	0.99

* Significance at P<0.05

Hypothesis 4: There will be a significant relationship between control beliefs toward complying with pre-operative skin preparation policy and PBC about the compliance.

With regard to testing the relationships between the control beliefs and PBC, a logistic regression analysis was used in order to deal with data that were not normally distributed. The predicted PBC variable was transformed into a binary (or dichotomous) dependent variable for the logistic regression analysis. PBC was operationalised as high PBC, coded (1), which included nurses who reported PBC

of (+3), and non-high PBC, coded (0) for nurses who reported PBC of 2.99 or less. Table 4.18 indicated that the model containing all predictors was statistically significant [χ^2 (7, N=229) =3, P<0.05], which explained 70% of variance in the PBC, as indicated by the Nagelkerke *R* Square. As shown in table 4.18, support and encouragement, clinical experience and patient's privacy were significant independent predictors of PBC, recording (Odds ratio 3.64, 95% CI=1.09-4.93, P<0.05), (Odds ratio 2.96, 95% CI=1.32-6.61, P<0.05) and (Odds ratio 1.69, 95% CI=1.14-2.57, P<0.05) respectively. The strongest predictors of reporting PBC were support and encouragement, followed by clinical experience and patient's privacy. It has indicated that nurses who perceived that they were supported and encouraged to comply with the pre-operative skin preparation policy, were almost four times more likely to exhibit higher level of PBC towards the compliance than other nurses. Nurses who thought they had an appropriately high level of clinical experience were approximately three times more likely than other respondents to exhibit a higher level of PBC to comply with the pre-operative skin preparation policy. In addition, nurses who professed to have an understanding of the sensitive issue of a patient's privacy were almost twice as likely to exhibit a higher level of PBC to comply with pre-operative skin preparation policy than other nurses.

The beliefs about financial incentives, workload, lack of equipment availability, nursing shortages and insufficient time did not independently influence PBC predictions concerning compliance with the pre-operative skin preparation policy (Table 4.18). Therefore, the full model, containing the three independent variables of control beliefs (e.g. support and encouragement, clinical experience and patient's privacy), has a significant influence in predicting PBC to carry out compliance with the pre-operative skin preparation policy: a conclusion which only supports hypothesis 4 [χ^2 (7, N=229) =3, P<0.05].

Table 4.18: Logistic Regression Analysis for Control Beliefs in Predicting PBC*

Independent Variables	Coefficient β	Standard Error	Wald Chi-Square	P-Value**	Odds Ratio	R2	95% Confidence Interval for Odds Ratio	
							Lower	Upper
Model								
Support and Encouragement	4.41	1.07	10.72	<0.05	3.64		1.09	4.93
Financial Incentives	0.84	0.30	7.84	**0.07**	1.31		0.98	1.75
Clinical Experience	1.09	0.41	6.98	<0.05	2.96	**0.70**	1.32	6.61
Patient's privacy	0.56	0.22	6.07	0.01	1.69		1.14	2.57
Workload	-0.15	0.12	2.49	**0.11**	0.83		0.65	1.05
Lack of equipment availability	0.56	0.39	2.00	**0.16**	1.71		0.81	3.59
Nursing Shortage	0.31	0.18	2.98	**0.08**	1.36		0.96	1.94
Lack of Time	-0.51	0.28	3.19	**0.07**	0.60		0.35	1.05

* Perceived Behavioural Control
**Significance at P<0.05

4.5 Conclusion

This chapter presented the quantitative results obtained by using the TPB cross-sectional survey. The target population was the multicultural nursing workforce involved in adult medical surgical units at PSMMC. The returned completed survey totalled 229 out of 240, representing an excellent response rate of 95%. Descriptive statistics was used to describe the sample characteristics such as age, gender, nationality, years of experience and level of education. Moreover, the instrument reliability was assessed using Cronbach's alpha coefficient of the TPB variables, indicating satisfactory values of reliability greater than 0.72. However, the reliability of indirect measures of the TPB constructs was not essential because a person may hold both positive and negative beliefs about the behaviour in question (Francis et al. 2004: Ajzen 2006). The significant correlation between the indirect and direct measures of the TPB constructs also make useful contributions to, as well as establish the stability and internal consistency of, the instrument. In addition, normality assumptions were assessed using skewness and kurtosis values, and diagrams presented levels of response in the form of histograms. Based on the univariate statistics, the data were considered non-normally distributed and therefore, non-parametric statistical tests. A hierarchical logistic regression was performed to examine the simultaneous effect of the TPB constructs related to the prediction of high behavioural intention to comply with the pre-operative skin preparation policy. The findings of this study revealed that nurses' behavioural intentions to comply with the pre-operative skin preparation policy were predicted by the TPB constructs (i.e. attitudes, subjective norms and PBC). The TPB model explained 40% of variance in the behavioural intentions. The results also revealed that direct and indirect measure constructs for attitude and the subjective norm were significantly related to nurses' high behavioural intention, whereas the direct and indirect measure construct for PBC did not add any further significance in either of the attitude and subjective norms variables. The next chapter presents the discussion of these results, focusing on the interpretation of inconsistencies in the findings of this study, when compared to similar studies.

Chapter 5: Discussion

Introduction

The purpose of this study was to examine the extent to which the Theory of Planned Behaviour (TPB) explains and predicts the behavioural intentions of the members of a multicultural nursing workforce to comply with the pre-operative skin preparation policy at the Prince Sultan Military Medical City (PSMMC) (Ajzen 1991). The findings of this study were discussed in relation to the guidelines of the TPB (Ajzen 1991; Francis et al. 2004). This chapter begins with a review of the major findings that are reported as a result of this study, followed by a discussion of the findings of an elicitation study (first phase study). After that, the findings regarding the TPB variables (second phase study), including the characteristics of the study sample, are discussed and compared to previous research. Then the TPB is evaluated relative to this new area of research. The strengths and limitations of the research are also presented. Finally, this chapter concludes with a discussion of the implications of the study findings for nursing practice in the Kingdom of Saudi Arabia (KSA), as well as offering certain recommendations for future research.

5.1 Overview of the major research findings

As described previously in the literature, the TPB suggests that attitudes, subjective norms and Perceived Behavioural Control (PBC) are the components that have been shown to contribute positively to predicting individuals' behavioural intentions (Ajzen 1991). Regarding the current study, the research hypotheses proposed that each of the TPB's components would contribute significantly to explaining nurses' behavioural intentions towards complying with the stipulated pre-operative skin preparation policy. Therefore, nurses who have a positive attitude toward complying, who believe that others in their social circle would approve their compliance, and who perceive themselves as having a high degree of personal control over the compliance, will have a higher behavioural intention towards complying with the required pre-operative skin preparation policy (Ajzen 1991; Francis et al. 2004). In this study, 40% of the variance in

nurses' behavioural intentions to comply was explained by nurses' positive attitudes toward that compliance and their perception of the opinions of significant others. However, the addition of the PBC did not result in significantly improving the predictive power in the study model. In addition, the TPB proposed that the indirect measures (i.e. behavioural, normative and control beliefs) are associated with their respective predictive direct measures (i.e. attitude, subjective norm and PBC) towards complying behaviour (Ajzen 1991; Ajzen & Fishbein 1980; Francis et al. 2004). Nurses' attitudes towards complying with the behaviour are assumed to be a function of beliefs about the consequences of their compliance or complying, as well as an evaluation of supposed outcomes of carrying out the compliance (Ajzen 1991, 2006). Normative beliefs relate to the perceived expectations of important individuals or groups of people regarding whether they approve or disapprove of carrying out the compliance. Normative beliefs combined with nurses' motivation to carry out their compliance, establish the subjective norm regarding compliance (Ajzen 1991, 2006). It is also assumed that the perceived capacity of each control factor to prevent or facilitate the compliance behaviour (i.e. control beliefs), contributes to PBC in direct correlation with nurses' perceived ease or difficulty of carrying out their compliance (i.e. perceived power) (Ajzen 1991, 2006).The findings obtained from the study's relation to the guidelines of the theory of planned behaviour are discussed below.

5.2 The elicitation of behavioural, normative and control beliefs (first phase study)

The aim of this study was to determine the consequences of nurses' behaviour, social referents and salient circumstances that form the belief structure underlying intention (Ajzen 2002). There have been no belief elicitation studies regarding compliance with pre-operative skin preparation policies in the hospitals of the KSA. Based on the guidelines for developing an elicitation study (Ajzen 2002; Ajzen & Fishbein 1980; Francis et al. 2004), this study was conducted in order to obtain the appropriate attributes for participation in compliance behaviour, from a sample of the target population (Puffer & Rashidian 2004). This method helped identify participants' beliefs as to the advantages/ disadvantages of participation in compliance behaviour, the individuals or people who they

believed would approve/disapprove of them carrying out the compliance, and factors that may make the compliance behaviour easy/difficult.

In this study, beliefs were clearly expressed that prevention from risks of infection and improvement to the quality of patient care were the two most prominent benefits of complying with the pre-operative skin preparation policy (Wandel et al. 2010; Jenner et al. 2002; Levin 1999; Tabak & Ozon 2004; Whitby et al. 2006; Efstathiou et al. 2011; Bischoff et al. 2000; Ahmed et al. 2008). A small number of responses, concerning the advantages of complying with the pre-operative skin preparation policy, highlighted avoiding possible delay or cancellation of the surgical procedure. However, other beliefs expressed in this study identified obstacles that negatively influenced the complying and led to non-compliance with the pre-operative skin preparation policy. These were beliefs such as the fear of getting a skin irritation as a result of using protective equipment, and causing skin injury to the patient as result of complying positively (Ajzen 2002; O'Boyle et al. 2001; Efstathiou et al. 2011).

In addition, the results of this study indicated that the most popular modal salient normative beliefs were physicians, senior nursing managers, 'head nurse', 'charge nurse' and 'work colleagues'. Support from these colleagues concerning approval of carrying out compliance with the pre-operative skin preparation policy would be valued by the nurses. However, the normative beliefs indicated that the compliance behaviour tends to be most influenced by patients and their relatives, due to the potential cultural conflicts arising from nurse-patient interaction. This confusion may, in part, emerge from low levels of cultural awareness about Saudi patients (Ajzen 2002; Almutairi & McCarthy 2012; Al-Shari 2002; Efstathiou et al. 2011; Sutton et al. 2003).

With regard to control beliefs, 'support/encouragement' was the most popular factor that would facilitate the carrying out of the compliance. It has been shown that the support of senior administrators and physicians, for members of the nursing workforce, resulted in a higher likelihood of their compliance (Lankford et al. 2003; Whitby et al. 2006). The results indicated that the higher level of clinical experience and sufficient financial incentives were the most important factors that would facilitate carrying out the compliance (Al-Ahmadi 2009). However,

non-availability of equipment was indicated as a barrier to carrying out the compliance (Efstathiou et al. 2011). The participants reported that time restraints, as well as the issue of a patient's privacy, prevented them from carrying out the compliance (Tabak & Ozon 2004). They indicated that due to their heavy workload and the nursing shortage, there was no time to carry out the compliance, which influenced their ability to comply with the pre-operative skin preparation policy (Ajzen 2002; Whitby et al. 2006; Zhang et al. 2007).

5.3 The findings of the Theory of Planned Behaviour study (second phase study)

Determining and testing predictors of complying with pre-operative skin preparation policy, among a multicultural nursing workforce, is a significant consideration when it comes to designing effective interventions that can ensure safe and high quality patient care. In the TPB study, a nurse's behavioural intention is identified by the TPB's constructs, which include attitude, subjective norm and PBC (Ajzen 1991). The study sample, correlations of the TPB variables and the findings relating to each construct of the TPB are discussed below.

5.3.1 The characteristics of the study sample and response rate

A convenience sample of 240 registered nurses was included to take part in this study and 229 nurses provided useable responses. It was acknowledged that the response rate might be influenced either positively or negatively by the strong element of the familiarity with the research setting. Although the researcher was aware of both advantages and disadvantages of familiarity and took steps to avoid coercion, an independent, non-insider researcher would be useful in similar future research (Smyth & Holian 2008; Unluer 2012). However, this resulted in a high response rate (i.e. 95%), which was similar to other studies (Ko et al. 2004; Malo et al. 2012) that utilised the TPB to examine nurses' behavioural intentions towards their clinical practice behaviours. Two main factors contributed to the increased response rate; firstly, the participants appreciated the significance of the study regarding the compliance of a multicultural nursing workforce. Secondly, the participants were greatly encouraged to participate by the hospital's

Nursing Administration department during the data collection process. In this study sample, females represented 76.4% of the respondents, compared to 23.6% of the nurses being males. The majority of nurses were Filipino (55.9%), followed by Saudi (34.1%), then Indian (9.6%) and one Swedish nurse. This is not surprising as in the KSA the majority of nursing workforces are from the Philippines and India (Aldossary et al. 2008; Almutairi & McCarthy 2012). In the sample of this study, the vast majority of respondents held a bachelor degree in nursing (93.4%), were 31-40 years old (64.6%), and had less than three years of professional experience as registered nurses (47.6%). However, in other studies the majority of respondents were female (99%), less than 35 years old, and had less than ten years of experience (49.6%) (Ko et al. 2004, 2011; Feng & Wu 2005; Sauls 2007).

5.3.2 Correlations, reliability and validity of the constructs

Spearman's rho correlations were used to assess the relationships between the theory of planned behaviour's constructs and the behavioural intention variable. In this study, although all direct and indirect measures of the TPB's constructs were significantly correlated with behavioural intentions, the indirect measure of PBC was not significantly correlated with behavioural intentions ($r=0.12$, $P>0.05$). However, attitudes, subjective norms and PBC yielded significantly positive relationships between the direct and indirect measures ($r=0.39$, $P<0.05$), ($r=0.41$, $P<0.05$) and ($r=0.27$, $P<0.05$) respectively. As with previous studies that utilised the TPB in general applications (Armitage & Conner 2001; Godin & Kok 1996; Godin et al. 2008) and in nurses' clinical practices (O'Boyle et al. 2001; Ko et al. 2011; Feng & Wu 2005; Dilorio 1997) attitudes, subjective norms and PBC were significantly positively associated with behavioural intention. Cronbach's alpha was also used to evaluate the internal consistency for all direct measures of the TPB constructs (i.e. attitude, subjective norm and PBC) (Ajzen 2006; Francis et al. 2004). In this study, the findings provided satisfactory levels of reliability because the alpha coefficients of the TPB's constructs were greater than 0.72 (Robinson et al. 1991). The reliability of indirect measures of the TPB's constructs was not appropriate, due to them not being parallel measures of the same content domain, where an individual had the potential to have both negative and positive beliefs about the behaviour (Francis et al. 2004; Eagly & Chaiken 1993). According to Ajzen (1991), correlation analysis is used to assess the validity of the indirect measures' representation of the direct measures. Hence, the findings

of this study are consistent with guidelines of the TPB that have been developed by Ajzen (2002), and recommended by Francis and colleagues (2004), which support discriminant validity between attitudes, subjective norms, PBC and behavioural intentions (Ajzen 1991; Francis et al. 2004).

5.3.3 Nurses' attitudes towards the compliance

It was found that attitudes were the strongest predictor of nurses' behavioural intentions to comply with the hospital's prescribed pre-operative skin preparation policy. That is, the positive or negative evaluation a respondent had about complying with the pre-operative skin preparation policy influenced their behavioural intentions, or lack of behavioural intentions, to carry out the compliance. In this study, it was hypothesised that attitudes would be significantly related to high behavioural intention. Results indicated that nurses with a positive attitude towards complying with the pre-operative skin preparation policy were approximately four times as likely to have high behavioural intention to comply as opposed to those nurses who did not profess such positive attitudes (Odds ratio 3.86, 95% CI= 2.07-7.20, $P<0.05$). These findings are significant and theoretically aligned with the TPB as Ajzen (1991) claimed that positive attitudes towards complying may be a better significant predictor of behavioural intention to perform compliance behaviour in the TPB model (Ajzen 1991). These findings could be interpreted as showing that some nurses recognised the value of complying with pre-operative skin preparation policy. Similar findings of nursing studies have also reported favourable perceptions toward carrying out compliance (Darawad et al. 2012; Sauls 2007; McCarty et al. 2001). Ko and colleagues (2004) found that nurses who had positive attitudes were more likely to report higher levels of a behavioural intention to carry out the compliance when caring for SARS patients, as compared with those with less positive attitudes. Parallel to other studies in the domain of nursing and health behaviour, this study also confirmed that attitude is the strongest predictor of behavioural intention (Jenner et al. 2002; Puffer & Rashidian 2004; Ajzen 1991; Armitage & Conner 2001; Godin et al. 2008). Support for this hypothesis came from Notani (1998) and Rivis and Sheeran (2003), who reported that attitude is the strongest predictor of behavioural intention among all the TPB's constructs. Additionally, this study supports the view that the influence of attitude was highly significant

on nurses' behavioural intentions (β=1.35, P<0.05) (Javadi et al.2013; Ko et al. 2004; Nash et al. 1993).

In the model of the TPB, it is suggested that behavioural beliefs are the main determinants of attitude. Attitude can be determined by a number of salient beliefs related to the behaviour in question (Ajzen 1991). Upon examination of the behavioural beliefs in this study, the logistic regression analysis showed that behavioural beliefs accounted for 52% of variance in attitude towards complying with pre-operative skin preparation policy [χ^2 (8, N=229) =13.9, P<0.05]. This study found that perceived prevention from the risk of infection, the quality of care improvement and avoiding delays or cancellation of the scheduled surgical procedure, were the predictors of attitudes towards carrying out the compliance. The quality of care improvement exerted a significant impact on nurses, motivating them to carry out the compliance (Odds ratio 4.46, 95% CI=1.33-14.99, P<0.05), followed by preventing the risk of infection (Odds ratio 4.32, 95% CI=1.45-12.88, P<0.05) and then avoiding delay or cancellation of the surgical procedure (Odds ratio 1.96, 95% CI= 1.33-2.88, P<0.05). In this study, nurses believed that complying positively with the pre-operative skin preparation policy would improve the quality of patient care, prevent the risk of infection and contribute to avoiding delaying or cancelling the surgical procedure. Results of other studies suggested that improving the quality of care, preventing the risk of infection and avoiding delays or cancellation of surgical procedures might affect the attitudes toward carrying out the compliance (Darawad et al. 2012; Larson & Kretzer 1995; Bischoff et al. 2000; Levin 1999; Tabak & Ozon 2004; Whitby et al. 2006; Efstathiou et al. 2011; Grol & Grimshaw 2003; Rashidian & Russell 2012).

5.3.4 Nurses' subjective norms towards the compliance

In this study, the three belief categories cited above were used to obtain a direct measure of subjective norms on complying with the pre-operative skin preparation policy (Ajzen 2002). Interestingly, nurses' subjective norms were significantly related to nurses' high behavioural intentions, which provided support for the study's hypothesis. Although several studies have argued that subjective norms are the weakest predictor of behavioural intention (Ajzen 1991; Armitage & Conner 2001; Jie et al.2009; Godin & Kok 1996; Puffer & Rashidian 2004; McCarty et al. 2001), other studies confirmed that subjective norms are

significant and strong indicators of behavioural intent (Sauls 2007; Jalilian & Emdadi 2011; Payant et al. 2008; Herbert et al. 2006; Ko et al. 2011; Gavaza et al. 2011). However, the findings of this study showed that a subjective norm is a significant and strong predictor of nurses' behavioural intention to comply with the prescribed pre-operative skin preparation policy (Odds ratio 3.37, 95% CI=1.71-6.64, P<0.05) and was second in predictive power only to the attitude construct. Overall, these findings are consistent with previous research which found that a subjective norm was a significant predictor of the behaviour in question (Edwards et al. 2001; Hagger et al. 2002; Kortteisto et al. 2010; Walsh et al. 2005; Whitby et al. 2006),. For example, the reasoning given for this finding by Whitby and colleagues (2006) was that maintaining social relationships, motivation and social pressure to comply were of great significance for their participants in their study. For this current study, the nature of nursing work involves extensive contact with other healthcare professionals, which may explain the relative importance of subjective norms in predicting nurses' behavioural intentions. Approval and disapproval registered by important others might play a significant role in the formation of nurses' behavioural intentions for complying with the required pre-operative skin preparation policy (Ajzen 1991; Francis et al. 2004).

According to Ajzen (1991), the TPB has been assessed based on people's decision-making, which means that it does not always take into account which decision-making can be influenced by certain societal norms. The TPB has been criticised by some researchers because it fails to take into account non-Western cultures (Hagger et al. 2002; Abraham et al. 1998; Sauls 2007).However, even though TPB was developed within Western countries, there is some evidence to support successful application in different populations in oriental countries, such as Singapore, Taiwan and Iran (Chirayil et al. 2014; Ko et al. 2011; Feng & Wu 2005; Javadi et al. 2013). This study suggest that in non-Western contexts, such as the KSA, the normative component of the TPB has been shown to have more relevance where nurses' decisions are responsive to social factors than in cultures where the decision-making process is more individualistic (Fekadu & Kraft 2002; Wiggins et al. 1994). Generally, Western countries such as the United States, Canada, Europe, Great Britain, Australia and South Africa are individualistic, whereas non-Western countries such as the KSA, India, Philippine and Japan are more collectivist (Bass & Bass 2009). The multicultural nursing workplace in Saudi

Arabian hospitals appears to consist of more collectivist cultures, rather than individualist cultures (Almutairi & McCarthy 2012; Aboul-Enein 2002; Green et al. 2005). In collectivist groups basic social-relationships are founded on the normative principle in that well-being of the collective is still more significant than the well-being of the individual (Bass & Bass 2009; Almutairi et al. 2012; Aldossary et al. 2008; Ua-Kit et al. 2004; Ajzen & Fishbein 1980; Almutairi & McCarthy 2012). This may be attributed to the differences between collectivist cultures, as compared to the more individualistic Western cultures (Ajzen 1991: Hagger et al. 2002). Collectivist cultures revolve around groups of people who, in the KSA context, influence nurses' compliance behaviour (Green et al. 2005). Therefore, social pressure combined with the approval and disapproval of important others (i.e. doctor, senior nursing personnel work colleagues and patients' relatives) are critically important for the members of the multicultural nursing workforce in carrying out their compliance with pre-operative skin preparation policy.

With regard to the nurses' normative beliefs, it is suggested that a subjective norm is determined by the number of normative beliefs, which are perceptions of whether important others approve or disapprove of a person carrying out a given behaviour (Ajzen 2002). Specifically, the strength of each normative belief is weighted by motivation to comply with the referent in question and the products are aggregated (Ajzen 1991; Francis et al. 2004). In this study, the logistic regression analysis showed that normative beliefs accounted for 35% of variance in subjective norms toward complying with the pre-operative skin preparation policy [χ^2 (8, N=229) =16.4, P<0.05]. Doctors, charge nurses and relatives of patients were independent significant predictors of subjective norms for complying with the pre-operative skin preparation policy. The findings revealed that doctors and charge nurses were believed to be very likely to support nurses' compliance (Odds ratio 2.08, 95% CI=1.18-2.35, P<0.05) and (Odds ratio 2.10, 95% CI=1.22-3.62, P<0.05), respectively, and the respondents were very likely to comply with them. However, the findings also showed that patients' relatives were believed to be likely to disapprove of nurses' compliance (Odds ratio 0.78, 95% CI=0.62-0.99, P=0.05), and, as a result, the respondents were less likely to carry out the compliance. Similar findings have also been reported in other nursing studies (Van Rooyen et al. 2010; Almutairi & McCarthy 2012; Efstathiou et al.

2011) where nurses were less likely to carry out the compliance. This suggests that the presence of patients' relatives result is one of the barriers to carrying out the required compliance behaviour (Halligan 2006). This may be linked to the fact that social and cultural factors in the KSA have likely impacted on the compliance behaviour among the members of multicultural nursing workforce (Ua-Kit et al. 2004; Glanz et al. 2008; Almutairi & McCarthy 2012; Halligan 2006). Furthermore, social and cultural factors may play a larger role in shaping perceptions of, and responses to, carrying out compliance with the pre-operative skin preparation policy among the members of a multicultural nursing workforce in the PSMMC. However, the findings of this study draw attention to cultural values held by participants' impact upon subjective norms toward compliance behaviour. It was suggested that the nurses' awareness of cultural values in their host country, is an essential element in increasing nurses' compliance (Almutairi & McCarthy. 2012S). Further research needs to be conducted to highlight nurses' awareness of cultural values, because this issue was not a prime focus of this study. Strategies that target international nurses specifically, in order to promote cultural awareness to enhance their knowledge and understanding of patients' cultural mores during healthcare delivery, and to enhance their skills in addressing culturally sensitive issues, would be beneficial in increasing the level of compliance with the pre-operative skin preparation policy (Van Rooyen et al. 2010; Halligan 2006; Almutairi et al. 2012). In light of nurses' limited knowledge regarding cultural values and practices in the Saudi context, the findings indicated that knowledge of such aspects of the patients' culture may enable nurses to comply with the pre-operative skin preparation policy (Van Rooyen et al. 2010).

5.3.5 Nurses' perceived behavioural control towards the compliance

With regard to PBC, four items were used to obtain a direct measure of PBC towards nurses' compliance with the pre-operative skin preparation policy (Ajzen 1991). In this study, the logistic regression analysis showed that PBC was not significantly related to nurses' behavioural intentions. In other words, the presence of both direct and indirect measures of attitude and subjective norm in the TPB model, did not add any statistically significant data to the prediction of nurses' behavioural intent to comply with the required pre-operative skin preparation policy (direct measure model: odds ratio 1.30, 95% CI= 0.81-2.09,

P=0.28); (indirect measure model: odds ratio 1.0, 95%, CI=0.98-1.02, P=0.88). Conversely, the majority of previous studies have highlighted the fact that when PBC was added to the TPB model, it was not only a significant contributor, but it was often the strongest predictor of behavioural intention (Ajzen 1991; Armitage & Conner 2001; Godin & Kok 1996; Notani 1998; Puffer & Rashidian 2004; Ajzen & Driver 1992; Conner & Sparks 2005; Ko et al. 2011). The findings of this study were consistent with other studies that found attitudes and subjective norms significantly related to high levels of behavioural intention, whereas PBC was not so related (Gavaza et a. 2011; Haktanir 2011; Bish et al. 2000; Abamecha et al. 2013; Mashburn et al. 2003; Ua-Kit et al. 2004; Ghahremani et al. 2012; Saengcharoen et al. 2008; Jackson et al. 2003; Patterson 2001). The findings of this study revealed that attitudes and subjective norms were significant determinants of nurses' high levels of behavioural intention, whilst PBC was not significantly related to their high behavioural intention. These findings suggest that, in the presence of attitudes and subjective norms, the PBC did not add a larger proportion of variance in nurses' high levels of behavioural intention over and above attitudes and subjective norms. Additionally, this indicates that nurses' behavioural intentions were not influenced by their perceptions of control over complying with the pre-operative skin preparation policy (Ajzen 1991).

According to the TPB, the PBC is determined by control beliefs (Ajzen 1991). The logistic regression analysis indicated that control beliefs accounted for 70% of variance in PBC [$\mathcal{X}^2$ (7, N=229) =3, P<0.05]. In this study, it was found that attributes such as support/ encouragement, clinical experience and a patient's privacy were the significant predictors of PBC regarding whether to comply, or not comply with the pre-operative skin preparation policy. The participants believed that receiving support / encouragement from senior administrators and physicians for members of the nursing workforce (Odds ratio 3.64, 95% CI=1.09-4.93, P<0.05), encouraged a higher likelihood of their compliance. The findings also indicated that the higher level of clinical experience was an important factor that would facilitate carrying out the required compliance (Odds ratio 2.96, 95% CI=1.32-6.61, P<0.05). These findings were consistent with previous studies showing that the support/encouragement and clinical experience would facilitate and motivate nurses to carry out the hand washing policy (Dwyer et al. 2005; Whitby et al. 2006; Ahmed et al. 2008). However, evidence shows that although

the issue of a patient's privacy often affected the nurses' performance (Tabak & Ozon 2004; Woogara 2001), the current study showed that understanding the issue of patient privacy among nurses would be a helpful factor towards increasing the level of their compliance (Odds ratio 1.69, 95% CI=1.14-2.57, P<0.05). Van Rooyen and colleagues (2010) reported that creating an awareness of the issue of patients' privacy among the nursing workforce in the KSA is an essential requirement that may contribute to enabling nurses to comply with the pre-operative skin preparation policy (Halligan 2006).

5.4 Evaluation of the Theory of Planned Behaviour model

As mentioned in the literature review chapter, Ajzen's (1991) TPB variables (i.e. attitudes, subjective norms and PBC) were used to predict nurses' behavioural intention with relatively high accuracy. In this current study the TPB model was utilised to measure nurses' behavioural intention to comply with the pre-operative skin preparation policy. Initially, the evaluation of the usefulness of the TPB model is based on the examination of the proportion of variance, which is explained by the regression analysis test or equation (R^2) (Francis et al. 2004; Polit et al. 2001). For example, Sauls (2007) found that the TPB explained 70% of the variance in intrapartum nurses' behavioural intention to provide professional labour support to patients. Similarly, Ko and colleagues (2011) found that the TPB constructs (i.e. attitude, subjective norm and PBC) explained 54% of the variance in nurses' behavioural intentions to comply with post-exposure management.

As the data were not normally distributed in this study, logistic regression was used, so R^2 values were not provided (Tabachnick & Fidell 2007; Polit & Beck 2004). In addition, the logistic regression analysis of the data in this study demonstrated that the combination of the three variables of the TPB was useful in predicting nurses' firm behavioural intent; a conclusion supported by highly significant models. The direct measures of the TPB model (e.g. three independent variables of attitude, subjective norm and PBC) were able to explain up to 40% of the variance in behavioural intention [χ^2 (2, N=229) =15.9, P<0.05]. The indirect measures of the TPB model explained 22% of the variance in behavioural intent [χ^2 (2, N=229) = 24.5, P<0.05]. This was similar to the result of Godin and Kok

(1996), as well as larger than the 39% average amount of variance that found in the meta-analysis by Armitage and Conner (2001) of 185 studies using the theory of planned behaviour framework. However, the power of the study model is clearly derived from the attitudes toward complying behaviour (Odds ratio= 3.86, 95% CI= 2.07-7.20, P<0.05) followed by subjective norms (Odds ratio=3.37, 95% CI=1.71-6.64, P<0.05). PBC did not significantly contribute to the model in predicting high levels of behavioural intention in the presence of the attitudes and subjective norms variables (Odds ratio 1.30, 95% CI= 0.81-2.09, P=0.28). Contrary to what was originally hypothesised, PBC had no influence on nurses' strong behavioural intent, while attitude and subjective norm did inform intention in the current study. This implies that carrying out the compliance is under the volitional control of nurses in this study and PBC is unlikely to exert any impact on their behavioural intentions toward the compliance behaviour. This suggested that nurses were determined to comply with the pre-operative skin preparation policy if they had a positive evaluation of compliance, and were the focus of positive beliefs and expectations held by who the nurses perceived as significant others (Ajzen 1991). In addition, in the presence of attitudes and subjective norms, nurses' behavioural intentions were not affected by the perceptions of their control over environmental factors that either prevent or enable them to comply with the pre-operative skin preparation policy (Ajzen 1991). Consequently, the logistic regression analysis showed that the likelihood ratio test of the additional variables of both direct and indirect measures of the PBC did not add any statistical significance to the TPB model in prediction of nurses' high behavioural intention over and above the direct and indirect measures of attitudes and subjective norms.

A review of previous research studies showed that the most significant predictors of behavioural intention were attitudes, subjective norms and PBC (Ajzen 1991; Godin & Kok 1996; Ko et al. 2004; Godin et al. 2008; Sauls 2007; Payant et al. 2008). Upon review of the findings of this study, in comparison to others, attitude and subjective norm were indicated as the strongest predictors of nurses' behavioural intention, while the addition of the PBC construct did not contribute in any statistically significant way to the TPB model. These findings were consistent with similar studies using the TPB as a basis of their theoretical framework (Randall & Gibson 1991; Schulze & Wittmann 2003; Gavaza et al. 2011; Herbert et al. 2006; Saengcharoen et al. 2008; Mashburn et al .2003; Ua-Kit

et al. 2004). In contrast, a number of studies of the TPB, across a wide range of behaviours, showed that the PBC construct added a larger likelihood of variability, as well as improving the model's predictive power concerning nurses' behavioural intentions toward carry out the compliance (Ajzen 1991; Armitage & Conner 2001; Godin & Kok 1996; Puffer & Rashidian 2004; Jenner et al. 2002; Godin et al. 2000). However, Ajzen (1991) argued that the nurses' behavioural intention in this study is less likely to be identified by environmental constraints. The lack of evidence for the interactive influences of the perceived control on nurses' behavioural intention could be partly explained by the fact that the significance of attitudes, subjective norms and PBC, in the prediction of behavioural intention, is based on the variation of behaviours and situations (Ajzen 1991; Patterson 2001). More specifically, the level of the relationship between the PBC and behavioural intention is dependent upon the characteristics of the target population, type of behaviour and the nature of the situation (Ajzen 1991; Glanz et al. 2008). Therefore, in the context of this study, where attitudes and subjective norms are strong, significant predictors, the PBC might be less predictive of behavioural intentions (Ajzen 1991; Gavaza et al. 2011). In addition, PBC did not add significantly to the model's power in the prediction of nurses' behavioural intention, possibly due to the fact that most participants were older, had a higher level of clinical experience and higher levels of education that take into account their actual control over the compliance behaviour (Ghahremani et al. 2012). Overall, the findings of this study support the Theory of Reasoned Action (TRA) in predicting and explaining the extent of nurses' attitudes and subjective norms, which influenced their behavioural intentions to comply with pre-operative skin preparation policy (Ajzen & Fishbein 1980). In other words, these findings are consistent with previous studies that have confirmed the TRA model's utility in predicting nurses' behavioural intentions, when their compliance behaviour is under volitional control (Albarracin et al. 2001; Hausenblas et al. 1997; Hagger et al. 2002).

Moreover, Abamecha and colleagues (2013) conducted a study among healthcare professionals in Ethiopia which indicated that attitude added the greatest proportion of variability to behavioural intention to use voluntary Human Immunodeficiency Virus (HIV) counselling and testing services, followed by subjective norms. The PBC indicated insignificant changes to the behavioural intention (Abamecha et al. 2013). The authors argued that non-significance

between the PBC and behavioural intention should not be disregarded because it may be due to control beliefs of the participants, whereby they might not be honest in putting themselves in the real situation; either they were incapable of undertaking the services or, in brief, there might be a possibility of their introducing a social desirability bias (Abamecha et al. 2013; Armitage & Conner 1999). Beck and Ajzen (1991) examined the influence of social desirability on the self-reporting of the TPB variables (i.e. attitude, subjective norm and PBC) and behavioural intentions. They found that the influence of PBC on behavioural intention is positively significant and it might be influenced by social desirability and questionnaire format (Armitage & Conner 1999; Conner et al. 2007). Therefore, future research would benefit from the inclusion of questions relating to the potential impact of social desirability in order to be able to statistically examine and control for the influences of the tendency to emphasise social desirability (Armitage & Conner 1999). Overall, it seems that the TPB model (Ajzen 1991) might provide a useful theoretical framework for providing a mechanism to determine psychosocial factors that would help to predict behavioural intentions to comply with the pre-operative skin preparation policy among members of a multicultural nursing workforce in the KSA. The results of this study could be used to inform future research directions.

5.5 Theoretical implications

As discussed above, the findings of the current study provided strong support for the capacity of the TPB to explain a mechanism for identifying factors that helped to predict behavioural intentions toward complying with the pre-operative skin preparation policy among the members of a multicultural nursing workforce (Ajzen 1991). It has shown that nurses' behavioural intentions can be predicted and explained by attitudes, subjective norms and PBC (Ajzen 1991). There were significant positive correlations between the belief-based measures of each construct and their respective direct measures. This suggests that behavioural beliefs, normative beliefs and control beliefs determine attitudes, subjective norms and PBC respectively (Ajzen 1991). Although the number of studies on compliance behaviour, among members of multicultural nursing workforces, is extremely limited, these current findings add to the literature, having utilised the application of the TPB as a theoretical framework for predicting behavioural

intentions towards a variety of behaviours found in nurses' clinical practice (Ajzen 1991; Perkins et al.2007; Godin et al. 2008; Puffer & Rashidian 2004). This present study finds that attitudes emerged as the significant predictors of nurses' behavioural intentions to comply, followed by subjective norms; however, PBC did not add further significance to the study model. The findings implied that nurses had firm positive attitudes to comply; they were strongly motivated to comply with the perceptions and expectations of important others to carry out the compliance. They did not perceive any control over the performance of compliance behaviour (Ajzen 1991). However, these findings have been consistent with previous published studies (Ghahremani et al. 2012; Abamecha et al. 2013; Saengcharoen et al. 2008; Gavaza et al. 2011; Ua-Kit et al. 2004), as well as inconsistent with findings regarding nurses' compliance (Ajzen 1991; Armitage & Conner 2001; Godin & Kok 1996; Ko et al. 2011; O'Boyle et al. 2001). More specifically, the findings of this study suggested that the TRA supports the idea that nurses generally take into account implications of their actions, before they decide to engage or not engage in compliance behaviour (Ajzen & Fishbein 1980). In other words, nurses' compliance behaviour is under their volitional control (i.e. attitude toward compliance behaviour and subjective norms) (Fishbein & Ajzen 1975; Ajzen 1991). The TRA constitutes a successful theoretical framework for explaining compliance behaviour when volitional control is elevated, meaning a high degree of perceived success or perceived and actual control over the internal and external factors might interfere with the execution of the compliance behaviour (i.e. PBC) (Montano & Kasprzyk 2002; Ajzen 1991). On the other hand, the TPB is more appropriate for explaining compliance behaviour when volitional control is low (Ajzen 1991; Ajzen & Fishbein 1980).Therefore, further research could be focused on the measurement of PBC and its role in nurses' compliance performance.

In this study, the strength of subjective norms, as the second strongest predictor in explaining variance, differs from the majority of the TPB studies involving nursing performance (Armitage & Conner 2001; Puffer & Rashidian 2004). Theoretically, this may indicate the TPB does not operate the same way in all nursing behaviour situations, varying depending on context and actual act studied (Ajzen 1991, 2006). It is also possible other unknown variables could be influencing nurses' behavioural intentions in the context of complying with the pre-operative skin preparation policy in the PSMMC. It is also possible the study's

setting of nurses in the KSA (i.e. the PSMMC), may have influenced the outcome of this study, as well as there may be different social pressures occurring in the background.

Scholars such as Ua-Kit and colleagues (2004), and Gavaza et al. (2011), have long asserted there are differences in social structures and referent groups in the way that nurses work and in their clinical behaviours. While the latent role of cultural values was not examined in this study, it is possible these roles may influence nurses desire to comply with pre-operative skin preparation policy, based on institutional pressures. Further research, involving the inclusion of cultural variables, would also represent significant input into the TPB model. These variables could impact the models' construct of normative belief, if integrated into the measurement of this salient belief construct.

Additionally, it was argued that the attitude, subjective norm and PBC constructs could not explain all the determinants of behavioural intentions, which therefore limits predictive accuracy (Ajzen 1991; Armitage & Conner 2001). This study used the TPB as a theoretical framework for the investigation, because the efficacy of the TPB to predict behavioural intentions has been demonstrated in several studies, including nursing clinical practice (Godin & Kok 1996; Armitage & Conner 2001; Ajzen 1991; Dilorio1997; Godin et al. 2000; Puffer & Rashidian 2004; Levin 1999; Ko et al. 2004; Tabak & Ozon 2004). However, the literature review showed that the additional predictors should be introduced into the model of the TPB, which can improve the validity of the study model (Ajzen 1991; Armitage & Conner 2001). Although, in the current study, the PBC variable did not provide any statistically significant data to the prediction of nurses' behavioural intentions to carry out the compliance, additional variables to the TPB model may be included in future research, in order to explain the expanding variance of behavioural intentions for carrying out compliance behaviour. According to Ajzen (1991), the TPB is open to additional predictors such as past behaviour and demographic variables, if it can be shown they capture an important portion of variance in behavioural intention. The author asserts that the inclusion of past behaviour in the prediction is a significant additional variable, which is directly related to behavioural intentions, which evaluates the theoretical sufficiency of the model and which assists in identifying the actual predictive power of

attitudes, subjective norms and perception of control (Ajzen 1991; Whitford & Jones 2011; Hagger et al. 2002). Overall, because past behaviour reflects influences from innumerable antecedents that affected behaviour in the past, that behavioural record can act as a statistical control that helps determine effects that are uncontaminated by the variables that caused, or at least contributed to, the behaviour in the past (Ajzen 1991). More specifically, several studies have shown that past behaviour was significantly related to behavioural intention, over and above the influences of attitudes and PBC (Sutton 1994; Conner & Armitage 1998).

Furthermore, the findings obtained from the elicitation study of this research project have determined the most significant behavioural, normative and control beliefs (i.e. salient beliefs) regarding compliance with the pre-operative skin preparation policy among members of a multicultural nursing workforce; beliefs which differed slightly from those held in Western cultures (Dwyer et al. 2005; Levin 1999). Such beliefs as were identified, provided the determinants of attitude, subjective norm and PBC constructs toward carrying out the compliance (Ajzen 1991). These findings of the elicitation study presented in this report can be used to inform future research directions. Overall, this study contributed to exploring ways to understand the factors influencing nurses' behavioural intentions to comply with the prescribed pre-operative skin preparation policy within the KSA context. It is therefore reasonable to assume that the findings of this study may be valuable to provide tools for replication of similar studies among multicultural nursing workforce populations in the KSA and beyond. This study could be useful for designing theory-based interventions for implementation that can ensure safe and high quality patient care by selecting modifiable variables (e.g. attitude, subjective norm and PBC). In addition, the TPB model is extended to include additional variables for investigating future interventions and directing the evaluation of interventions once they have been implemented. Further discussion regarding implications for nursing practice will be presented in the next section.

5.6 Implications for nursing practice

There are several practical implications for the nursing workforce associated with this study. The findings of this study can provide guidelines for nursing educators and staff development educators in healthcare organisations in the KSA. This would develop the understanding of the potential determinants of nurses' behavioural intentions toward complying with the pre-operative skin preparation policy, as well as many other clinical practices, within a multicultural nursing environment. This study revealed that attitudes, subjective norms and PBC constitute the most important antecedents of nurses' behavioural intentions toward carrying out their compliance (Ajzen 1991). It may be recommended that effective intervention strategies, aiming to increase compliance behavioural intentions of a multicultural nursing workforce, should target these variables in order to foster positive attitudes towards complying with guidelines (Ajzen 1991). The findings of this study suggest that the success of attempts to encourage the members of a multicultural nursing workforce to comply with nursing policies will be enhanced when contextual variables, important to the success of the change intervention, are put into place. These findings provide support for developing education and orientation programmes for nurses that lead to the dissemination of best clinical practice guidelines across nursing orientations. These findings would help healthcare professionals to understand the relationship between beliefs and carrying out the compliance among individuals within a multicultural nursing workforce. First, the findings indicated that behavioural beliefs are associated with the prevention from risk of infection, quality of patient care improvement and avoiding delaying or cancelling a scheduled surgical procedure.

It is reasonable to argue that the intervention aimed at promoting nurses' engagement in complying with the guidelines should focus on increasing positive attitudes for nurses. Providing information to nurses about the significance of the pre-operative skin preparation policy, including preventing the risks of infection, improvement to the quality of patient care, and avoiding delays or cancellations of surgical procedures, would be an effective way to encourage nurses to comply with the pre-operative skin preparation policy (Ajzen 1991; Martín-Madrazo et al. 2009; Darawad et al. 2012). Second, normative beliefs were related to the opinions expressed by doctors, charge nurses and relatives of patients. Therefore, interventions should focus on strategies that identify the sources of

social pressure in a positive way through involving the role of doctors, charge nurses and relatives of patients in the delivery of guidelines, as well as increasing the recognition and approval of nurses who are dutifully carrying out the compliance (Godin et al. 2008; Nelson et al. 2013; Almutairi & McCarthy 2012; Efstathiou et al. 2011; Van Rooyen et al. 2010). Finally, the examination of the control beliefs indicated that nurses perceived that support/encouragement, clinical experience and the issue of a patient's privacy were the most important factors influencing them to comply with pre-operative skin preparation policy. Consequently, intervention strategies could focus on providing support and encouragement from senior administrators and physicians for members of the nursing workforce, assisting them to gain clinical experience and an understanding of the issue of patients' privacy, in order to increase the likelihood of nurses' compliance (Whitby et al. 2006; Dilorio1997; Efstathiou et al. 2011; Tabak & Ozon 2004). These strategies would assist the members of the nursing workforce to overcome those obstacles that prevent them from carrying out the compliance, as well as assisting them to achieve personal control over carrying out their compliance behaviour (Ajzen 1991; Puffer & Rashidian 2004).

Overall, the findings of this study suggest that only attitudes and subjective norm variables were significantly related to nurses' high behavioural intention to comply with pre-operative skin preparation policy. Although these findings need to be verified in future research, they suggest that interventions aimed at improving nurses' compliance with nursing policy, should target all nursing workforce members in the PSMMC, as well as in the KSA. These findings provide support for the idea of developing nursing intervention strategies by using guidelines which could be adopted to address beliefs which, in turn, would be used to promote improved nurses' behavioural compliance. This initiative would include providing education programmes to re-educate nurses to maximise the positive consequences of their compliance, increase the motivation offered from colleagues and managers, and identify sources of environmental deficits in order to ensure high standards of safety and quality nursing care. In addition, the intervention strategies may include the findings of this study in order to develop: nursing workshops, peer support activities, training, conferences, symposia, nursing grand rounds and study days within the PSMMC, all initiatives designed to enhance nurses' compliance with pre-operative skin preparation policy.

Nurses' compliance interventions may change their attitudes, subjective norms and PBC by using persuasive communication through targeting salient behavioural, normative and control beliefs respectively (Ajzen & Fishbein 1980; Fishbein & Yzer 2003). Persuasive communication has been found to be effective as a technique that can take the form of written text that focuses on the beliefs-based measures and which offers support for the benefits of carrying out the compliance among the nursing workforce (Albarracin et al. 2003). It can be proposed that the content of persuasive communication, targeting behavioural beliefs and attitudes, should advocate the utility of carrying out the compliance in preventing risks of the infections, improving the quality of patient care and avoiding delay or cancellation of a surgical procedure. The persuasive communication is a process involved in behaviour change that would be initially information-based, so providing the nurses with the important pieces of information required to create a desirable attitude towards carrying out the compliance behaviour (Ajzen 1991). Further, persuasive communication targeting normative beliefs and subjective norms should advocate the benefits of carrying out the compliance by highlighting approval from doctors, charge nurses and relatives of patients. Lastly, persuasive communication targeting control beliefs and PBC needs to facilitate nurses' perceived factors for carrying out the compliance such as more support/ encouragement, gain clinical experience and awareness regarding the issue of patient's privacy (Ajzen 1991).

This study also showed the importance of control beliefs in predicting PBC towards compliance with the pre-operative skin preparation policy. It may be helpful for senior nursing managers to focus on shaping control beliefs, where such beliefs play a key role in shaping PBC toward the compliance behaviour. The findings of this study would help nursing educators and nursing managers in designing a well-structured nursing education programme that may influence these beliefs, by focusing on a strategy of compliance with nursing policies and procedures, a development designed to ensure the quality and safety of nursing care. Appropriate nursing education is essential to ensure nurses believe and feel that they have the competence to carry out compliance with the prescribed pre-operative skin preparation policy. Education provided in-institution is not a favourable option, as this may lead to habitual behaviours being taught rather

than the adoption of evidence based approaches. Exploring educational requirements among the members of a multicultural nursing workforce to enhance competency and increase perceived behavioural control is thereby essential to ensure all nurses have actual control. For example, pre-and post-evaluation of nursing educational programmes or workshops could be useful to ensure accurate knowledge about the benefits of complying with a specified pre-operative skin preparation policy. Engaging in appropriate clinical supervision in order to continually challenge and identify learning needs to ensure competency levels are maintained, is a necessary initiative for nurses to be competent to carry out the compliance efficiently and effectively. Furthermore, this study could be supportive for hospital policy makers and nursing administrators who are endeavouring to develop effective interventions based on nursing education programmes involving of cultural competence, empowerment, awareness, knowledge, skill and interaction. In addition, such interventions should include continual evaluation and monitoring of nurses' compliance in order to ensure the safety and high quality of nursing care (Darawad et al. 2012; Almutairi et al. 2012).

The TPB would support health professionals to better understand the factors that motivate nursing workforce members to carry out the compliance. The findings of this study might potentially assist senior nurse managers, clinical directors, nursing educators and researchers in evaluating, modifying and developing clinical practice settings. Such settings would be designed to support effective interventions for nurses, to promote their compliance with nursing policies in order to ensure the safety and quality of patient care in the KSA (Ploeg et al. 2007; Pittet et al. 1999; Godin et al. 2008; Puffer & Rashidian 2004). The aim of the interventions is to modify nurses' attitudes, subjective norms and PBC in regarding compliance with the pre-operative skin preparation policy (Murphy & Canales 2001; Pittet et al. 1999; Puffer & Rashidian 2004).

Nurses' behavioural intentions can be influenced by targeting their attitudes, subjective norms and PBC (Ajzen 1991). More specifically, nurses' behavioural intentions to carry out the required compliance were related to a number of workplace factors such as role expectations toward carrying out the compliance, social reinforcement and both the internal perceptions of capability and external

opportunities to carry out the compliance (Ajzen 1991; Francis et al. 2004). Consequently, the findings of this study would be useful to develop effective nursing interventions including local induction, continuous education and training programmes. In addition, training, access to resources including written materials on complying with the pre-operative skin preparation policy, and the availability of orientation programmes are important components in providing effective nursing interventions (Kovner et al. 2010). These findings can be employed in continuing education courses for nurses that may prove valuable in increasing nurses' compliance practice in a multicultural environment for improving the safety and quality of nursing care (Khani et al. 2008). Through nursing education and training courses, as well as through quality nursing care awareness campaigns, nurses might be encouraged improve nursing care, and have positive attitudes, social support and perception control towards, carrying out their compliance that contributes to ensuring the safety and quality of nursing care in the KSA. Consequently, it is suggested that effective interventions (e.g. education and training programmes) would be focused on increasing nurses attitudes, subjective norms and PBC in order to enhance their behavioural intentions to carry out the compliance practice consistently and appropriately (O'Boyle et al. 2001; Efstathiou et al. 2011; Akyol 2007).

5.7 Study limitations

Although this study was one of the few to have measured nurses' behavioural intention towards complying with nursing policies and procedure by employing the TPB, there were some limitations that need to be acknowledged. The major limitation of this research is that the actual behaviour and level of compliance was not measured. Ajzen and Fishbein (1980) suggested that to improve the predictive power of actual compliance behaviour, based on behavioural intention, measuring behavioural intention should be translated into the observation of actual compliance behaviour. Nevertheless, the effectiveness of implication is that the TPB model would be applied with great predictability and sufficiency, even where there is not a readily available measure of actual behaviour (Francis et al. 2004; Armitage & Conner 1998). It has been suggested that although the TPB variables predicted and explained behavioural intention in many healthcare studies, behavioural intention did not necessarily predict, or transpose into actual

behaviour (Francis et al. 2004; Sauls 2007; Payant et al. 2008). Therefore, the measurement of actual behaviour for nurses' compliance was excluded in this study, due to the absence of using the observation method. This absence was deliberate, in order to ensure the anonymity of participants, as well as because using self-completion responses that were not correspond with actual compliance behaviour (Armitage & Conner 2001).

In addition, this study sought to provide exploratory patterns of beliefs in predicting nurses' behavioural intentions towards carrying out the compliance, but did not examine the value of these beliefs in predicting actual compliance. This leaves the crucial question of whether nurses' behavioural intentions do, in fact, predict and translate into their actual behaviour in this setting (i.e. intention-behaviour gap) (Sheeran 2002; Walker et al. 2001; Francis et al. 2004).The intention-behaviour gap is the missing link in understanding the adoption of healthcare behaviour (Sheeran 2002). It has been suggested that although attitude, subjective norm and PBC predicted behavioural intention in many healthcare studies, behavioural intention did not necessarily predict or translate into actual practice behaviour, thereby resulting in a gap between behavioural intentions to perform the behaviour and actually carrying out that particular behaviour (O'Boyle et al. 2001; Puffer & Rashidian 2004; Ko et al. 2011; Dilorio1997; Sauls 2007). However, the concepts such as action planning, coping planning and implementation of behavioural intentions were found to be effective strategies in overcoming the intention-behavioural gap (Rhodes & Bruijn 2013; Sniehotta et al. 2005; Gollwitzer 1999; Randall & Wola 1994).

There were also other unexpected limitations in this study. The variables were not normally distributed, so were analysed by using non-parametric statistics. In addition, although data analysis of this study used the multiple regression analysis, the Structure Equation Modelling (SEM) should be used in future research to overcome the limitations associated with the traditional multivariate regression analysis, in order to estimate and examine the hypothesised study model effectively (Byrne 2013; Saengcharoen et al. 2008).

Ajzen (1991) suggested that the impact of the TPB might differ in different populations. This study was limited to registered nurses performing the pre-operative skin preparation practice at adult medical surgical units in only one healthcare organisation (i.e. the PSMMC in the KSA). The research was conducted by using a convenience sample. Therefore, the research findings may not be representative of the contexts in other organisations, and the elicitation method to develop the indirect salient beliefs scale was formed using this population. For this reason, these findings cannot be generalised to other multicultural nursing workforces in other healthcare institutions in the KSA or elsewhere. Further research should include other healthcare institutions in the KSA, involving a larger and more diverse sample of the nursing workforce; an option which may produce different findings, as well as support those findings' generalisability (Polit & Beck 2004).

A further limitation is that there has been no example of a similar study of compliance with nursing policies having been carried out in the KSA that could have supported, or even challenged, the validity of this study. The only way to ensure the internal validity of this current research was to design the TPB measures strictly according the guidelines provided by Ajzen and Fishbein (1980), as contained in a manual published by Francis and colleagues (2004). However, a weakness stemming from strict adherence to these guidelines, that became more apparent during the analysis of results, is that no additional qualitative data were gathered during the elicitation study. This could have led to the accumulation of a lot of additional information if qualitative data had been collected during the questionnaire stage. The addition of qualitative data during the elicitation study could have added other important dimensions to an understanding of attitudes, subjective norms and PBC, which cannot be gleaned by using the quantitative data alone (Creswell & Plano Clark 2011).

The data of this study were collected by using a self-completion survey design in both study phases (i.e. first and second study phases). Although justification for use of this design has been provided, this type of data is susceptible to bias related to the use of a common method (Podsakoff et al. 2003; Burns & Grove 2011). Given the self-completion nature of the questionnaire, some nurses may have been influenced by social desirability factors that can cause respondents to

modify their self-completion responses in a favourable direction; however, the study was anonymous in an attempt to mitigate this threat (Armitage & Conner 1999; Adam et al. 1999). In this study, all variables were assessed via self-completion answers, which were then analysed by using non-parametric statistics, due to the non-normal distribution of the data. Individuals might lie or skew their answers in order to make themselves look better. Respondents, either wittingly or unwittingly, frequently do not give an accurate response as a result of their cognitive bias or because they have insufficient self-knowledge. It is difficult to control this possibility, but findings should be qualified by this fact. For example, in this study, most participants' responses to the TPB scale were of a 'lenient fashion' exemplified by the nurses selecting higher scores instead of providing more objective and candid responses to the questionnaire items. In other words, nurses' might have been motivated to present a positive situation regarding their perceptions, behavioural intentions, attitudes, subjective norms and PBC (Haktanir 2011). This may have enhanced the social desirability that might influence the quality of evaluation (Armitage & Conner 1999; Conner et al. 2007). In addition, self-completion questionnaires for collecting data may produce high correlations between measures, in part because the data share common method variance, hence errors in measurement are correlated with each other (Park & Kim 2009; Chirayil et al. 2014; Field 2005). Therefore, future research could benefit from inclusion of social desirability scales in order to be able to statistically examine and control for the impacts of any tendency to provide socially desirable responses.

Finally, a number of researchers have suggested that some external variables, such as demographic variables, directly influence nurses' behavioural intentions via attitudes, subjective norms and PBC (Ajzen 1991; Ajzen & Fishbein 1980; Sauls 2007). In fact, very few empirical researchers combine these external variables within the TPB model (Ajzen & Fishbein 1980; Ajzen 1991). In this study, the nurse-related demographic data were collected to provide brief descriptive statistics relating to demographic variables, in order to understand the frequencies of nurses' characteristics toward complying with pre-operative skin preparation policy in the PSMMC. However, demographic variables were not considered in the TPB model as predictors to enhance the potential findings. In this study, some basic demographics were collected but were not considered to enhance the potential findings. While a criticism of the study could focus on

beliefs at the expense and lack of demographics, the TPB advocates any effect on the compliance behaviour would be mediated by the theory's proximal variable (Fishbein & Ajzen 2005). Further, this study considers the beliefs of a very specific and self-categorised group of registered general nurses, so demographic data are irrelevant. Ajzen and Fishbein (1980) argued that the importance of the demographic variables is bound to fluctuate, depending on situational contexts, as opposed to the constructs of the TPB that they argue remain (unaltered?) constructs under all circumstances. Accordingly, the removal of demographics allowed for more focus on the TPB constructs, which would support a deeper exploration of respondents' beliefs. The trade-off between beliefs and demographic questions was therefore seen as a beneficial, excluding demographic variables in order to enhance the design of the study (Ajzen 1991). In future research, these demographic variables should be included to assist in explaining nurses' compliance behaviour.

5.8 Recommendations for future research

From the perspective of future studies, the findings of this study suggest recommendations for future research with respect to their design. Future studies should take into consideration using longitudinal and experimental studies in diverse populations. The scope of this present study was restricted to the members of a multicultural nursing workforce located in one workplace environment (i.e. the PSMMC in the KSA). Therefore, the research findings might not be extrapolated to other nurses' workplace environments nationwide. With reference to external validity, the findings cannot be generalised to other members of multicultural nursing workforce populations outside of the PSMMC. More diverse populations across different healthcare facilities in the KSA should be included in future research. In addition, although the sample size of this study was reasonably acceptable, other studies have far larger samples (Francis et al. 2004; Ko et al. 2011; Feng & Wu 2005; Edwards et al. 2001; Godin et al. 2008). Consequently, future studies should attempt to replicate findings obtained from the current study by using a larger sample size that would strengthen and support the research findings (Francis et al. 2004; Polit & Beck 2004).

In the multicultural workplace, it is recommended that nurses' engagement may play a major role in their attitudes, subjective norms and PBC, in order to improve their compliance with nursing policy in the KSA, particularly in the PSMMC. Further exploration of specific aspects relevant to these psychosocial constructs, which would allow researchers to develop a more reasoned understanding of relationships between sociocultural values and compliance with the pre-operative skin preparation policy, is highly recommended. Further research should focus on diverse settings and populations to expand the TPB model. Considering the 'cultural values' variable may provide further insights into ways to increase the rate of nurses complying with hospital policies and procedures among a multicultural nursing workforce in the PSMMC. For example, differentiating between the impact of social influence as a measure of subjective norms and compliance behaviour would begin the process of refining the data that currently exists. The concept of compliance should engage both the members of a multicultural nursing workforce and healthcare providers to practice cultural awareness. This goal could be achieved by such initiatives as nursing education, induction, training programmes and continuing development of the multicultural nursing workforce members, to ensure the implementation of safe and effective healthcare practice. In addition, intervention strategies to improve behavioural intention to carry out the compliance behaviour among the members of multicultural nursing workforce using the findings of the current study, are required. Further, healthcare managers in the PSMMC should provide cultural-based intervention strategies focused on improving nurses' engagement towards complying with the hospital's nursing policies (Almutairi & McCarthy 2012; Van Rooyen et al. 2010; Thakkar et al. 2011; Parrish & Linder-VanBerschot 2010; Vogts et al. 2011).

Moreover, the inclusion of demographic variables and related concepts will provide robust opportunities for new research. In the stage of questionnaire development, the constructs of the TPB were anchored in the specific beliefs of the members of the multicultural nursing workforce, in the PSMMC, who participated in this study. Thus, there is room for cultural mores, ethnic norms and religious customs and beliefs to be represented in the way that the constructs are operationally defined. There are some studies that have already highlighted the influence of cultural backgrounds on the behaviour of multicultural nursing workforce members (Almutairi et al. 2012; Almutairi &

McCarthy 2012; Van Rooyen et al. 2010; Halligan 2006). In this current study, the demographic information of participants showed that nurses have different cultural backgrounds, similar to findings from other previous studies (Ko et al. 2011; Sauls 2007). However, this study did not consider the socio-demographic variables when exploring nurses' behavioural intentions, attitudes, subjective norms and PBC towards carrying out their compliance. The relationship between nurses' compliance and their demographic characteristics needs to be fully explored in future research. In addition, a number of studies found empirical evidence supporting past behaviour, as an extension of the theory of the TPB model, which can improve the predictive power of the model (Ajzen 1991; Conner et al. 2000; Albarracin et al. 2001; Conner & Armitage 1998). It is recommended that the 'past behaviour' variable should be included within the TPB model in any relevant future research, because its contribution to predicting a significant proportion of the variance, in carrying out the compliance, used self-reported behaviour, over and above the influence the TPB constructs (i.e. attitude, subjective norm and PBC) (Sheeran et al. 1999; Conner & Armitage 1998). Other studies have indicated that the inclusion of past behaviour provides for a stronger relationship with the behavioural intention and the compliant behaviour (Hagger et al. 2002; Sutton 1994; Ajzen 1991; Conner & Armitage 1998; Conner et al. 2000).

It would also be useful, when considering future the TPB studies, to explore the influence of attitudes and subjective norms, over and above the PBC variables, in order to make the TPB a robust research model. As mentioned previously, this study found that 'attitude' added the largest proportion of variability to nurses' behavioural intentions, followed by subjective norms. However, PBC did not add any statistically significant data to the TPB model regarding either attitude or subjective norm constructs. These findings may be due to differences in target populations and the circumstances in which the behaviour occurred (Glanz et al. 2008; Fishbein & Ajzen 2005). However, previous published studies both support (Ghahremani et al. 2012; Gavaza et al. 2011; Saengcharoen et al. 2008; Mashburn et al .2003; Ua-Kit et al. 2004) and challenge these findings for carrying out the compliance (Ajzen 1991; Armitage & Conner 2001; Godin & Kok 1996), thereby demonstrating that additional research is recommended to tackle this apparent ambiguity.

Also, this study adopted qualitative methods (i.e. an elicitation study) that allowed an in-depth exploration of nurses' beliefs towards complying with the hospital's pre-operative skin preparation policy. Quantitative methods were used to test the interaction between psychological factors in predicting and explaining nurses' behavioural intentions to comply with the pre-operative skin preparation policy. As a result, in this study, both qualitative and quantitative methodologies were used to direct the psychological examination of nurses' behavioural intentions toward carrying out the required compliance behaviour. However, in this study, the TPB did not examine the relationships between nurses' behavioural intentions and actual compliance behaviour. Therefore, it is strongly recommended that future research should include the measure of actual compliance behaviour and explore the antecedents of attitudes, subjective norms and PBC. It has been noted that this will be very challenging and will require a lot of thought. However, this could be achieved through a variety of methods including actual observations, field notes, recordings and staff interviews all focusing on the actual performance of the compliance behaviour (Ajzen 1991; Ajzen & Fishbein 1980; Francis et al. 2004; Armitage & Conner 2001; Conner et al. 2000).

5.9 Conclusion

In summary, the TPB is a theoretical framework that has been used to explain and predict behaviour across a wide array of contexts (Godin et al. 2008). Although this model has been used extensively for health-related behaviours (Godin & Kok 1996; Perkins et al. 2007), its use to explain and predict nurses' behavioural intentions to comply with nursing policy has been limited. This study used the TPB as a theoretical framework underpinning the investigation. The efficacy of the TPB has been utilised to explain and predict behavioural intentions across a wide range of health behaviours, including nurses' behavioural intentions in clinical practice (Ajzen 1991; Godin & Kok 1996; Perkins et al. 2007; Puffer & Rashidian 2004; Whitby et al. 2006; Levin 1999; Ko et al. 2011; Sauls 2007; Payant et al. 2008). The purpose of this study was to utilise the TPB to understand the determinants of behavioural intentions of the members of a multicultural nursing

workforce, towards carrying out the required compliance with the pre-operative skin preparation policy at PSMMC in the KSA.

The major strength of this thesis is that it has contributed to the theoretical literature on nurses' compliance behaviour. The procedure used during initial data collection adds considerable strength to this study. The measures were designed in strict adherence to guidelines prescribed by Ajzen & Fishbein (1980) and recommended by Francis et al. (2004), to ensure the questionnaire construction adhered to established guidelines. Pilot testing of research instruments helped to maintain the reliability and validity of the results (Ajzen 1991). In addition, this study was conducted using the TPB model that was well validated by a number of similar studies in explaining and predicting nurses' behavioural intentions toward carrying out their clinical duties (Puffer & Rashidian 2004; Payant et al. 2008; Dilorio1997; Dwyer et al. 2005; Nelson et al. 2013). For example, the first phase of this study used qualitative methods (i.e. an elicitation study) that provided an in-depth exploration of the salient beliefs held by members of a multicultural nursing workforce (Ajzen 1991; Burns & Grove 2011). In the second phase of this study, quantitative methods were employed to test the interaction between the psychosocial variables in predicting nurses' behavioural intentions toward complying with the pre-operative skin preparation policy (Ajzen 1991; Francis et al. 2004). Therefore, both approaches provided significant contributions when examining the psychosocial determinants that influence nurses' behavioural intentions toward carrying out their compliance (Ajzen 1991).

Overall, the findings of this study provided support to the TPB for predicting nurses' behavioural intentions for complying with a prescribed pre-operative skin preparation policy. However, the PBC construct did not add any statistically significant data to the TPB model in predicting the multicultural nursing workforce's members' behavioural intentions to carry out the compliance; as opposed to the attitudes and subjective norms constructs. Additionally, attitudes emerged as the strongest predictor of nurses' behavioural intentions toward complying with the pre-operative skin preparation policy, followed by subjective norms. This implies that nurses with positive attitudes, and who perceived more social pressure from specific groups of significant others, were much more likely

to comply with the pre-operative skin preparation policy. Therefore, developing effective intervention strategies should target the beliefs of the members of a multicultural nursing workforce that affect unfavourable attitudes, and their normative beliefs that are affect by the opinions of those significant others toward complying with the hospital's pre-operative skin preparation policy. More specifically, the findings of this study can assist in the development of education, orientation and training programmes for nurses designed to improve their compliance behaviour, as these findings reveal several entry points for effective interventions. Using the findings of this study, future research should extend the TPB model to include additional variables, such as past behaviour and demographic factors, in order to examine the predictive power of nurses' behavioural intentions towards carrying out their compliance with a required pre-operative skin preparation policy.

Appendices

Appendix A : Data resources and search strategies for systematic review

Database	Key Words	No of Articles	No of Relevant Articles	Words Search	Articles Included
CINAHL	The TPB Nursing* Intention* Compliance* Attitude* Belief* Subjective norm* PBC*	979 480667 12462 39891 153818 23643 661 166	0 110 4 	All (The TPB with Nursing) (The TPB with Nursing, Intention and Compliance)	1. Feng & Wu (2005). Title Nurses' intention to report child abuse in Taiwan: a test of the theory of planned behavior. 2. Puffer and Rashidian (2004). Title Practice nurses' intention to use clinical guidelines.
OvidSP	The TPB* Nursing* Intention* Compliance* Attitude* Belief* Subjective norm* PBC*	3158 1220819 273939 496634 811949 291493 3097 866	0 31 56 	All All (without PBC) (The TPB with Nursing, intention and compliance)	1. Whitby et al. (2006). Title Why Healthcare Workers Don't Wash Their Hands: A Behavioral Explanation.
PubMed	The TPB Nursing Intention Compliance Attitude Belief Subjective norm PBC	1438 533359 27816 106914 250085 669275 490 1530	0 1 6 1	All All (without Belief & PBC) The TPB with Nursing, Attitude, Subjective norm and PBC. The TPB with Nursing, intention, compliance, Attitude and	1. Ko et al. (2011). Title Intention to comply with post-exposure management among nurses exposed to blood and body fluid in Taiwan: application of the theory of planned behaviour. 2. Levin (1999). Title Test of the Fishbein

Database	Key Words	No of Articles	No of Relevant Articles	Words Search	Articles Included
				Subjective norm.	and Ajzen models as predictors of healthcare workers' glove use.
PsycINFO	The TPB Nursing* Intention* Compliance* Attitude* Belief* Subjective norm* PBC*	2286 73708 40059 22387 342573 83846 1971 1211	1 44 2	All The TPB, Intention and Compliance (TPB, Nursing, Compliance, Attitude, Subjective norm, and PBC)	1. Whitford and Jones (2011). Title An exploration of the motivation of pregnant women to perform pelvic floor exercises using the revised theory of planned behaviour.

Appendix B : Summary of Papers Reviewed

Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
1-Puffer and Rashidian (2004) Title: Practice nurses' intentions to use clinical guidelines	A cross-sectional survey using a postal questionnaire was carried out; a 52-item questionnaire was administered to 48 practice nurses in England.	Evidence indicates that, although nurses are increasingly using clinical guidelines to ensure higher quality of care, there is a wide variance in their adherence to them. The utility of the Theory of Planned Behaviour (TPB) has not been previously investigated in explaining this variance in community nursing. Study's aims to examine the utility of the TPB in explaining variations in practice nurses' intentions to offer smoking cessation advice in	The questionnaire was designed to assess the components of the TPB, and included measures of intentions to offer smoking cessation advice, self-reported past behaviour, attitudes, subjective norms, perceived behavioural controls (PBCs), behavioural beliefs and evaluations, normative beliefs and motivation to comply, and control beliefs and evaluations	The TPB explained up to 40% of the variance in intentions to offer smoking cessation advice. Attitudes and PBCs were the most important predictors of intention. Among other elements of the TPB, indirect attitudes and indirect PBCs made significant positive contributions to explaining variance in intention.	Future trials of interventions to increase practice nurses adherence to clinical guidelines could attempt to address the elements identified in this study as important factors. Further studies are required to examine the utility of the TPB in predicting practice nurses' behaviour

Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
		accordance with coronary heart disease guidelines			
2-Clayton and Griffith (2008) Title: Efficacy of an extended theory of planned behaviour model for predicting caterers' hand hygiene practices	Observation and a questionnaire was administered.	The main aim of this study was to determine the factors that influence caterers' hand hygiene practices using social cognitive theory. One hundred and fifteen food handlers from 29 catering businesses were observed carrying out 31,050 food preparation actions in their workplace.	The procedure for observing food handlers and the notational coding system used to record food handlers' actions. Ninety food preparation actions were recorded for each food handler present at the first observation. After all observations had been conducted participants were asked to complete Hand Hygiene questionnaires.	The TPB provided a useful framework for understanding caterers' implementation of hand hygiene practices, explaining 34% of the variance in hand hygiene malpractices. Five components were identified as significant predictors of hand hygiene malpractices: attitudes, subjective norms, descriptive norms, perceived behavioural control and intention.	Future research may benefit from exploring caterers' perceptions of control and the attitudes and actions of colleagues and supervisors in greater depth. Qualitative techniques could be utilised to explore issues beyond the analysis of individual attitudes in order to form a picture of interactions at an organisational level.
3-Sauls (2007)	A retrospective exploratory study	The study was to examine the	Study was used to survey 39 registered	The Theory of Planned Behaviour (TPB) explained	Both attitude and social

Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
Title: Nurses' Attitudes toward Provision of Care and Related Health Outcomes		contribution of attitudinal, normative, and control influences on intrapartum nurses' intentions to provide professional labour support (PLS) to parturient women and to assess whether behavioural intent could predict the outcome of length of labour.	nurses and 419 nurse-patient dyads to understand the relationship between predictor variables, behavioural intention, and health outcomes. Multiple regression analysis was used for statistical analysis.	70% of the variance in intrapartum nurses' intentions to provide PLS to their patients. Behavioural intent had no statistically significant impact on a patient's length of labour.	pressures had a significant impact on the intention and results show the relative importance of these variables in understanding the nurse's intention, to provide support. Further studies are required to determine if the TPB can predict health outcomes through nurses' intentions to provide care.
4-Whitby et al. (2006) Title: Why Healthcare Workers Don't Wash Their Hands: A Behavioural Explanation	Focus-group discussions and questionnaires built on a literature review.	The study was to elucidate behavioural determinants of hand washing among nurses. One community hospitals and three tertiary care hospitals involved.	Statistical modelling using the Theory of Planned Behaviour and relevant components to hand washing behaviour by nurses that were derived from focus-group discussions and literature review.	The TPB explained 64%, and 76%, respectively, of the variance in behavioural intention.	A small increase in hand washing adherence may be seen after implementing the use of alcoholic hand rubs, to decrease the effort required

Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
					to wash hands. However, the facilitation of compliance is not simply related to effort but is highly dependent on altering behavioural perceptions. Thus, introduction of hand rub alone without an associated behavioural modification program is unlikely to induce a sustained increase in hand hygiene compliance.
5-Dilorio (1997) Title: Neuroscience	Questionnaires	This study, which was based on Ajzen's theory of planned behaviour,	368 members of a neuroscience nurses completed questionnaires	Attitudes accounted for a significant percentage of variance when entered at the first step, and	Nursing attitudes were very significant in nursing

Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
Nurses' Intentions to Care for Persons with HIV/AIDS.		was to determine the extent to which personal attitudes, subjective norms and perceptions of behavioural control influence the intentions of nurses to care for persons with HIV/AIDS.	measuring the concepts of attitudes, subjective norms, PBC and intention to care for persons with HIV/AIDS. Hierarchical regression analysis was used to determine if nurses' intentions were predicted by their attitudes and subjective norms, and if PBC would add to the prediction.	perceived behavioural control accounted for a significant increase in variance when entered at the second step. In the final model, only PBC contributed significantly to the prediction of intention.	willingness to care for patients. The result show that the conditions under which nurses provide care can impact their intentions. This study finding has implications for nurse administrators who are instrumental in creating safe and supportive work environments for nurses.
6-Godin et al. (2008) Title: Healthcare professionals' intentions and behaviours: A systematic review of	A systematic review (assessment) of social cognitive theories.	This study was designed to systematically review the published scientific literature about factors influencing health professionals' behaviours based	This study searched psycINFO, MEDLINE, EMBASE, CIHNAL, indexes of theses, PROQUEST dissertations and theses and Current Contents for articles published in English only. The authors	The theory most often used as reference was the Theory of Reasoned Action (TRA) or its extension the Theory of Planned Behaviour (TPB). An overall frequency-weighted mean R2 of 0.31 was observed for the prediction of behaviour;	The study suggested that the TPB appears to be an appropriate theory to predict behaviour whereas other theories better capture the

Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
studies based on social cognitive theories.		on social cognitive theories. These theories refer to theories where individual cognitions/thoughts are viewed as processes intervening between observable stimuli and responses in real world situations.	included studies that aimed to predict healthcare professionals' intentions and behaviours with a clear specification of relying on a social cognitive theory. Information on the percentage of explained variance (R2) was used to compute the overall frequency-weighted mean R2 to evaluate the efficacy of prediction in several contexts and according to different methodological aspects.	0.59 for the prediction of intention. A number of moderators influenced the efficacy of prediction; frequency-weighted mean R2 varied from 0.001 to 0.58 for behaviour and 0.19 to 0.81 for intention.	dynamic underlying intention. In addition, given the variations in efficacy of prediction, special care should be given to methodological issues, especially to better define the context of behaviour performance.
7- Levin (1999) Title: Test of the Fishbein and Ajzen models as predictors of healthcare workers'	The study used a random sample. Each member of the initial sample received a questionnaire and a cover letter that explained the study. The LISREL	The purpose of this study was to identify predictors of healthcare workers' intentions and self-reported use of gloves when there is potential for blood exposure.	The sample includes 527 nurses and laboratory workers who have experienced an incident of blood exposure. The age ranged from 20 to28 years. In terms of compliance with glove	Although the final TRA (Theory of Reasoned Action) model did not fit, the data indicated a good fit for the model. As in other studies, a direct path from attitude to behaviour suggested that intention did not fully	The study recommended that future research should be directed at improving the measures of attitude and perceived

Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
glove use.	(linear structural relations model) was used to determine which model was the best fit for the data.		use, responses to the items that measured glove use behaviour indicated that both nurses and laboratory workers reported frequent glove use. However, only 52% of the nurses and laboratory workers reported wearing gloves every time there was potential blood contact.	mediate the attitude-behaviour relationship. Results supported the theory of planned behaviour (TRB) in that perceived control was an important addition to the understanding of intention. Perceived control was the strongest predictor of healthcare workers' determination to wear gloves.	control to further investigate the predictive capabilities of these theoretical models using other protective measures and to confirm the theoretical relationships found in this and other studies.
8- Ko et al. (2011) Title: Intention to comply with post-exposure management among nurses exposed to blood and body fluids in Taiwan: application of the theory of	A cross-sectional survey was applied to select registered nurses who worked in human immunodeficiency virus (HIV)-designated hospitals.	Nurses are at significant risk from occupationally acquired blood borne virus infections, following a needle stick and/ or sharps injury. This study aimed to apply the theory of planned behaviour (TPB) to predict nurses' intention to comply with occupational post-exposure	A total of 802 nurses (71%) reported blood and body fluid exposure incidents between 2003 and 2005 and this group was used for analysis. Only 44.6% of the 121 exposed nurses who were prescribed post-exposure prophylaxis (PEP) by infectious disease doctors returned to the clinic for interim monitoring, and only 56.6% of	Structural equation modelling was used to test the TPB indicating perceived behavioural control (the perception of the difficulty or ease of PEP management, $\beta=0.58$), subjective norm (the perception of social pressure to adhere to PEP, $\beta=0.15$), and attitudes ($\beta=0.12$) were significant direct effects on nurses' intention to comply with post-exposure management.	The TPB is an appropriate model for predicting nurses' intentions to comply with post-exposure management. Healthcare facilities should have policies to decrease the inconvenience of follow-up to encourage

Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
planned behaviour.		management.	exposed nurses confirmed their final serology status.	The hypothesised model test indicated that the model fitted with the expected relationships and directions of theoretical constructs. The TPB model constructs accounted for 54% of the variance in nurses' intention to comply with post-exposure management.	nurses to comply with post-exposure management.
9- Whitford and Jones (2011) Title: An exploration of the motivation of pregnant women to perform pelvic floor exercises using the revised theory of planned behaviour.	Longitudinal cohort study.	The study is to investigate the motivation of pregnant women towards the practice of pelvic floor exercises during pregnancy using the revised Theory of Planned Behaviour (RTPB), incorporating measures of past behaviour.	The method of this study includes interview and investigation by self-administrated questionnaire using the RTPB as a framework. A follow-up postal questionnaire was sent between 6 and 12 months after delivery.	The TPB variables (attitude, subjective norm, and self-efficacy) explained 53.1% of the variance in intention to practise pelvic floor exercises during pregnancy. Perceived vulnerability to incontinence (attitude to the current behaviour) had no relationship with intention. Measures of past behaviour significantly improved the percentage of explained variance in intention. Confidence in ability to	The study recommended that future compliance with pelvic floor exercises may be enhanced by effective instruction to enhance confidence in ability to contract the correct muscles and promotion of measures to help establish a habit of

Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
				perform pelvic floor exercises correctly (self-efficacy) reliably predicted subsequent practice	exercising the pelvic floor muscles.
10-Dwyer et al. (2005) Title: Defibrillation beliefs of rural nurses: Focus group discussions guided by the Theory of Planned Behaviour	Non-experimental and descriptive exploratory, incorporating focus group interviews and survey data	The endorsement of the chain of survival concept and early defibrillation has challenged health professionals to reconsider their beliefs regarding how they respond to in-hospital resuscitation. In the rural context, where 24 hours coverage is not available nurse-initiated defibrillation is expected. Despite literature and policy change in Australia to allow nurses to initiate defibrillation, there is no current study that uses a systemic theoretical	This study used focus groups within the framework of the TPB to describe the defibrillation beliefs of rural registered nurses in two acute care hospitals in Australia. The study sample was consisted of 10 female and two male nurses. Focus group questions were designed to elicit salient beliefs (i.e. behavioural, normative and control beliefs) within the TPB theoretical framework. The constructs of salient beliefs guided the development of the question and analysis of the discussions. Content analysis was used to	The salient beliefs elicited based on two behavioural beliefs, four normative beliefs and four control beliefs categories. In behavioural beliefs categories, open-ended question was asked about the advantages and disadvantages of nurse's ability to use a defibrillator. The two categories were quicker response time that mentioned by 15 responses and increased success with resuscitation was mentioned by eight responses. In normative beliefs, the respondents were asked to determine who would approve or not approve of them being responsible for the use of defibrillators in	The most issues for these participating nurses were related to the consequences for the patient, support and confidence with rhythm recognition. Understanding rural nurses beliefs as they pertain to nurse-initiated defibrillation might provide educators with some insight as to what changes are needed to increase nurse-initiated defibrillation.

Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
		approach to examine the specific beliefs of nurses and their use of defibrillation. The aim of this research was to elicit a beginning understanding of the defibrillation beliefs of rural nurses.	analyses the data collected from the study.	their clinical area. Four normative beliefs indicating 100% of the response including patients, nurses, doctors and the nursing registration body such as the Queensland Nursing Council. Regard to control beliefs, the respondents were asked to identify any events that would impact their decision to use or not use a defibrillators if there was a cardiac arrest on their ward on that day. The control beliefs categories included rhythm recognition that mentioned by 22 responses, litigation by 15 responses, fear of harm to patient or self by 11 responses and roles by four responses.	The most issues for these participating nurses were related to the consequences for the patient, support and confidence with rhythm recognition. Understanding rural nurses beliefs as they pertain to nurse-initiated defibrillation might provide educators with some insight as to what changes are needed to increase nurse-initiated defibrillation. In conclusion, the constructs of the TPB provided a promising theoretical

Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
					framework for providing a beginning understanding rural nurses' defibrillation behaviour. Explaining and facilitating defibrillation behaviour might be achieved through an understanding of the benefits of nurse-initiated early defibrillation on patient survival, the support of others, confidence and rhythm recognition. The TPB is a greatest important framework in explaining and understanding nurses' use of

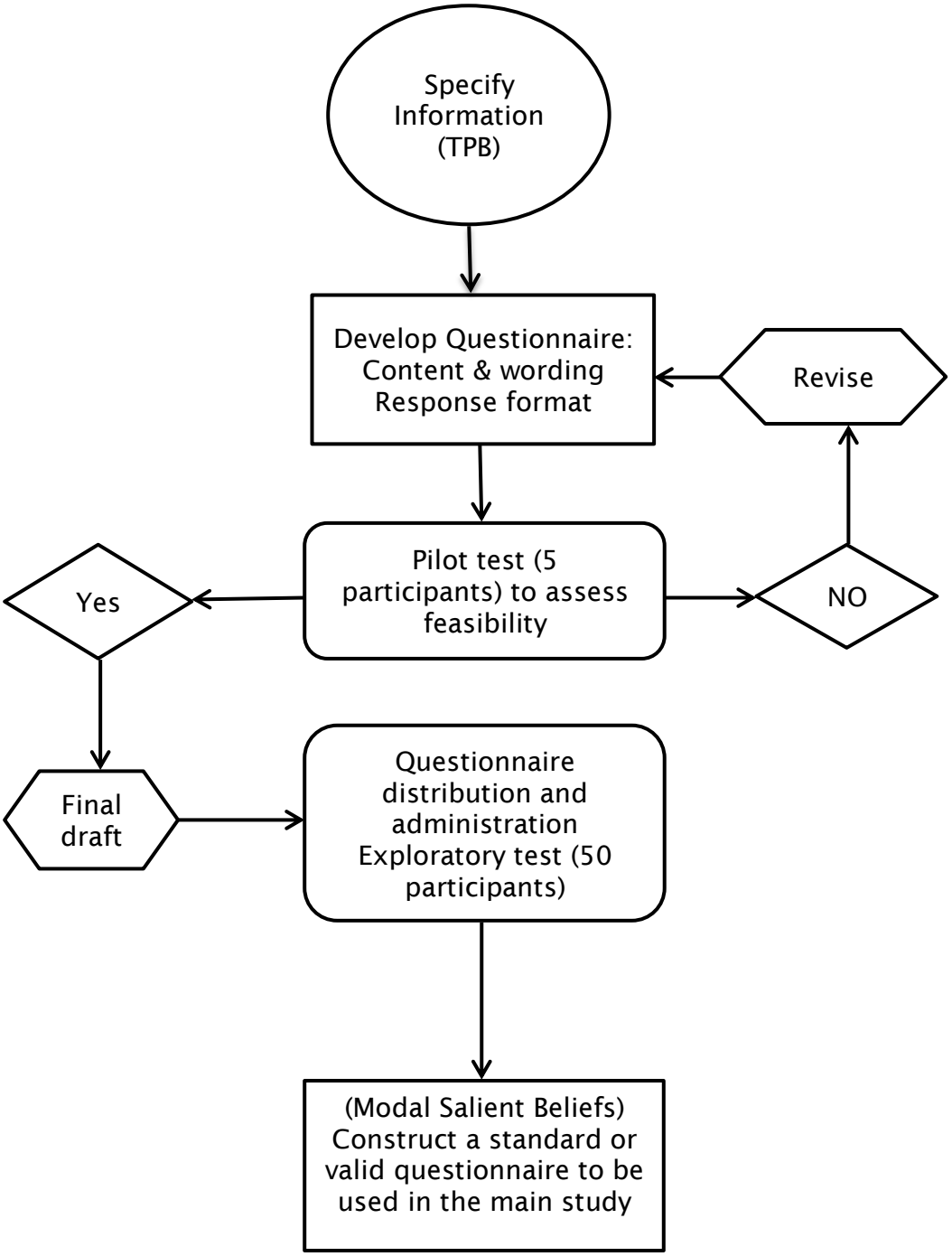
Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
					defibrillators.
11-Cote et al. (2012) Title: Using the Theory of Planned Behaviour to predict nurses' intention to integrate research evidence into clinical decision-making.	A predictive correlational study	Health professionals are increasingly asked to adopt evidence-based practice. The integration of research evidence in nurses' clinical decision-making would have a significant influence on the quality of care provided for patients. Although evidence supporting this practice and the availability of high quality study in the field of nursing, the gap between research and practice is still present.	A total of 336 nurses working in university hospital participated in this study. Data was collected within two months in 2008 by means questionnaire using the TPB. Descriptive statistics of the model constructs, Pearson correlations between all the constructs and multiple linear regression analysis were performed.	Nurses' intention to integrate study findings into clinical decision-making can be predicted by moral norm, normative belief, PBC and behaviour. The moral norm is the most important predictor. In general, the final the TPB model 70% of the variance in nurses' intention.	The current study supports the use of an extended psychosocial theory for identifying the determinants of nurses' intention to integrate study evidence into their clinical decision-making. Interventions that focus on increasing nurses' perceptions that using research is their responsibility for ensuring good patient care and providing a supportive environment can enhance an evidence-based nursing

Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
					performance.
12-Javadi et al. (2013) Title: Applying Theory of Planned Behaviour in Predicting of Patient Safety Behaviours of Nurses	A stratified sample of 124 nurses who worked at the selected hospitals of Isfahan in 2011. A descriptive study using questionnaire designed by guided of the TPB model.	Patient safety has become a critical concern throughout the world. It is the absence of avoidable harm to a patient during the process of healthcare; ensuring safer care is a major challenge, psychosocial variables influences behaviours of human. The TPB is a well-validated behavioural decision-making model that has been used to predict social and health behaviours. This study is purposed to investigate predictors of nurse's patient safety intentions	124 nurses participated in this descriptive analytical study. The study tool was a questionnaire consisted of 65 questions prepared to examine patient safety behaviour and behaviour constructs of nurses about guideline of constructing a TPB questionnaire (Conceptual and Methodological Considerations). Questionnaire Validity was confirmed by experts and its reliability was assessed by Cronbach's alpha as 0.87. Binary logistic regression analysis was performed to evaluate how well each TPB constructs predicted the variance in patient safety	The findings showed that the normative beliefs were the most significant influence on nurses' intention to maintain patients' safety behaviours. Also the results showed that the control beliefs impact nurses' behaviour in surgical words and normative beliefs impact nurses' behaviour in medical words.	Normative beliefs and subjective norms were the major influential factor of safety behaviour of nurses in this research. Considering the role of cultural context in theses issue, it seems education of managers and top individuals regarding patient safety and its significance is a priority also control believe were another important predicting factor of behaviour in surgical words and intensive care units.

Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
		and behaviour, using a TPB framework.	behaviour. The data was analysed by using SPSS.		Regarding the complexity of work in these areas, applying medical guidelines and adequate supervision should be followed.
13-Feng and Wu (2005) Title: Nurses' Intention to Report Child Abuse in Taiwan: A Test of the Theory of Planned Behaviour	A cross-sectional and correlation study.	This study was conducted to determine factors contributed to nurses' intention to report suspected child abuse in Taiwan and to identify the empirical efficacy of the extended the TPB to explain nurses' intention to report child abuse.	A stratified quota sampling technique was used to select registered nurses different hospital units in Taiwan. Total of 1617 nurses participated and 1362 questionnaires were returned, representing 84% in a response rate. A cross-sectional and correlational study was conducted in three phases. Firstly, a quantitative study in which 18 nurses that was interviewed about their experiences working with abused	In this study, only 14% of Taiwanese nurses had ever reported one or more case of child abuse and 21% mentioned that they had encountered at least one suspected incident that they did not report. Of 291 who gave the reasons for not reporting, 79% ranked feeling uncertain regarding the evidence as the major significant reason for failure to report. In addition, 80% reported never having had any child abuse content in their nursing education for their degree	This study was supported that the TPB was significant in determining factors that associated with nurses' intentions to report child abuse in Taiwan. The longitudinal study that examines the level of nurses' intention and the actual report behaviour would contribute to understanding

Study	Study Design	Introduction	Methods	Results	Discussion/ Conclusion
			children and their families. Secondly, the Child Abuse Report Intention Scale (CARIS) was developed and validated to measure nurses' attitudes, knowledge, subjective norms and PBC and their intentions towards the reporting behaviours of child abuse in Taiwan. Thirdly, the CARIS was used to a conduct a survey among Taiwanese nurses and the data were used to test the extended the TPB model in explaining and predicting nurses' intention to report child abuse in Taiwan.	and 87% reported never having had child abuse education during in-service education. About 75% felt their nursing education pertaining to child abuse was inadequate and 83% felt the in-service education pertaining to child abuse was either inadequate or completely absent. In the findings, structural equation modelling demonstrated that nurses' attitudes towards reporting child abuse, subjective norms and PBC (i.e. the TPB model) explained 85% to 91% of the variance in nurses' intention to report child abuse in Taiwan.	of the relationship between intention and behaviour to report child abuse and whether interventions that target these predictors produce actual behavioural change. This study provides a substantive base for adding scientific body knowledge related to child abuse cross-culturally.

Appendix C : Overview of questionnaire design process



Appendix D : Ethical Approval from the ERGO

Part I: the first phase study (i.e. Elicitation study)

UNIVERSITY OF Southampton

To Whom It May Concern

27 January 2015

Project Reference: 5578

Project Title: Using the Theory of Planned Behaviour to explore the intentions of a multicultural nursing workforce to comply with policies and procedures in Prince Sultan Military Medical City (PSMMC)

Investigator: Ahmed Yami

The protocol for this project was reviewed and approved by the University of Southampton Faculty of Health Sciences Ethics Committee on 21/03/2013.

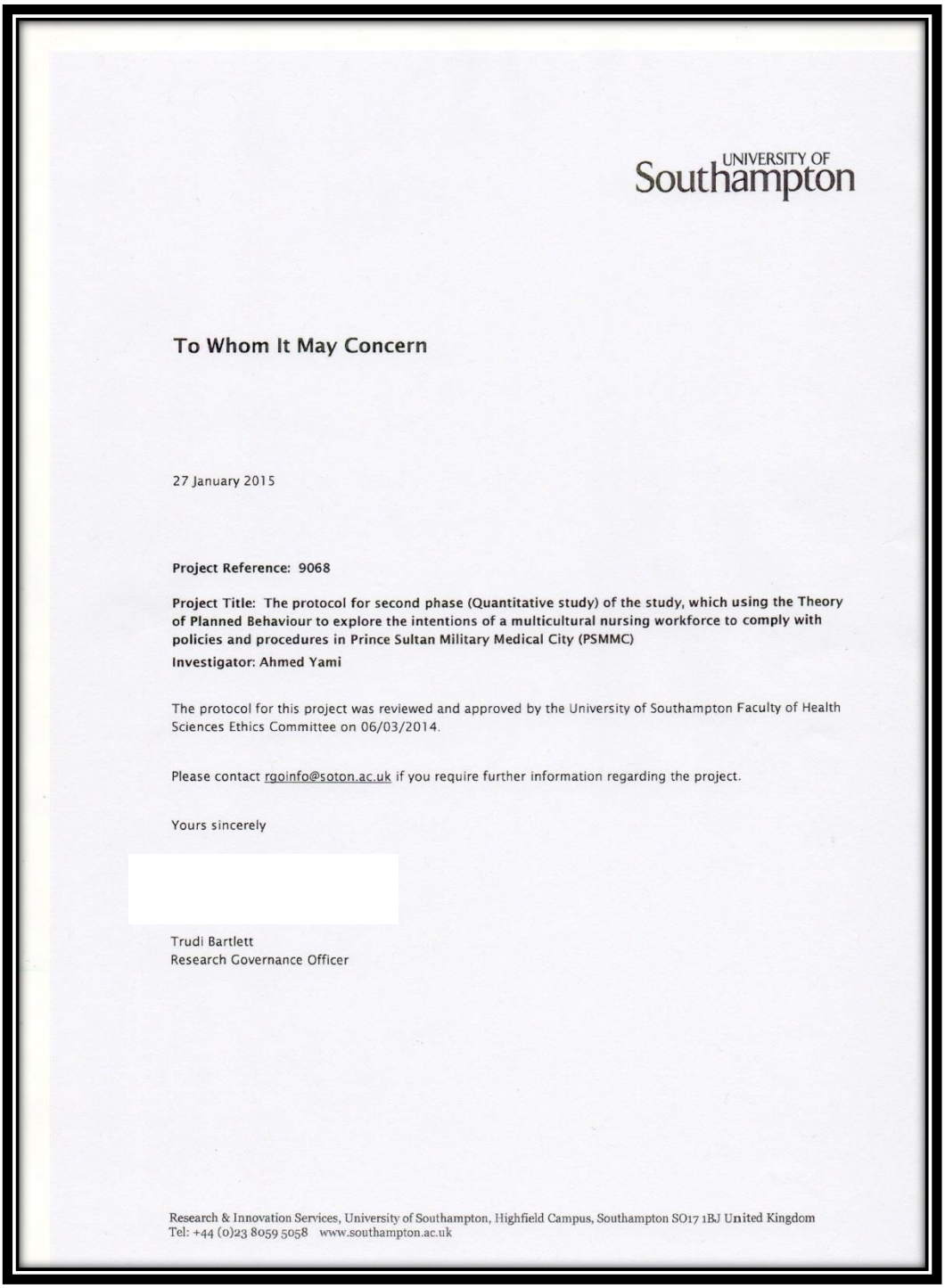
Please contact rgoinfo@soton.ac.uk if you require further information regarding the project.

Yours sincerely

Trudi Bartlett
Research Governance Officer

Research & Innovation Services, University of Southampton, Highfield Campus, Southampton SO17 1BJ United Kingdom
Tel: +44 (0)23 8059 5058 www.southampton.ac.uk

Part II: the second phase study



UNIVERSITY OF Southampton

To Whom It May Concern

27 January 2015

Project Reference: 9068

Project Title: The protocol for second phase (Quantitative study) of the study, which using the Theory of Planned Behaviour to explore the intentions of a multicultural nursing workforce to comply with policies and procedures in Prince Sultan Military Medical City (PSMMC)

Investigator: Ahmed Yami

The protocol for this project was reviewed and approved by the University of Southampton Faculty of Health Sciences Ethics Committee on 06/03/2014.

Please contact rgoinfo@soton.ac.uk if you require further information regarding the project.

Yours sincerely

Trudi Bartlett
Research Governance Officer

Research & Innovation Services, University of Southampton, Highfield Campus, Southampton SO17 1BJ United Kingdom
Tel: +44 (0)23 8059 5058 www.southampton.ac.uk

Appendix E : Ethical Approval from Ethics Committee of the PSMCC

M.S.D

PRINCE SULTAN MILITARY MEDICAL CITY

P.O. Box 7897, Riyadh 11159
Kingdom of Saudi Arabia

Research Ethics Committee

06 March 2013

MR. AHMED AL YAMI
PhD Student
University of Southampton

Re: Using the theory of planned behavior to explore the intentions of a multicultural nursing workforce to comply with policies and procedures in Prince Sultan Military Medical City (PSMMC)

Two members of Research Ethics Committee have reviewed and discussed in detail the above mentioned proposal. And on behalf of the committee, I am pleased to inform you that this research project has now been approved as chairman action.

Your research protocol has been documented under:

Project No.	497
Date Approved	06 March
Series of	2013

Kindly quote the project number indicated herein in all transactions and communications. You are advised to submit a report in relation to this research scheme to update the committee of its progress.

I trust your research scheme proves fruitful and beneficial to the PSMMC.

Best regards,

DR. SAEED KADASAH
Chairman, Research Ethics Committee
First Floor, Building 15

Appendix F: Covering letter (Elicitation Study)

Centre for Innovation and Leadership in Health Sciences

UNIVERSITY OF Southampton

Dear participants,

My name is Ahmed Yami, a Doctorate in Clinical Practice (DClinP) student in the Faculty of Health Sciences, University of Southampton. I am doing a doctoral research project to investigate perceptions about beliefs towards compliance with pre-operative skin preparation policy among a multicultural nursing workforce at Prince Sultan Military Medical City (PSMMC). This research is in partial fulfilment of the requirements for the degree of DClinP in nursing.

I would like to invite you to consider participating in a research study by **completing an anonymous questionnaire**. You are invited to read the information provided which will tell you about why the study is being conducted and what it would mean if you decided to take part. Your assistance is requested by answering the survey questions in as much detail as possible.

For open-ended questionnaires, please feel free to use the back of the papers if you need more space. Please be aware that your responses will be completely anonymous and we will not know who you are. A collection box to collect the completed and blank questionnaires has been placed in the Nursing Administration Department. **Please return the survey to the collection box, either filled it out or left it blank.**

Your participation in this study would be highly appreciated.

Sincerely,

Ahmed Yami
DClinP Student
Faculty of Health Sciences
University of Southampton
Email: aay2g11@soton.ac.uk

Appendix G : An information sheet for the Elicitation Study

Centre for Innovation and Leadership in Health Sciences

UNIVERSITY OF Southampton

Participant Information Sheet

Study Title: Using the Theory of Planned Behaviour to explore the intentions of a multicultural nursing workforce to comply with policies and procedures in Prince Sultan Military Medical City (PSMMC).

Researcher: Mr Ahmed Ali Yami.
Ethics number: 5578
Please read this information carefully before deciding to take part in this research. If you are happy to participate you will be asked to sign a consent form.

What is the research about?
This project is being undertaken as part of the Doctoral in Clinical Practice (DClinP) programme in nursing at the Faculty of Health Sciences, University of Southampton. This programme is funded by the PSMMC. The funding body will not have access to the data obtained during the project. This doctoral studentship is supervised by Dr. David Voegeli, Dr. Margaret Donovan-Hall and Dr. Bashir Lwaleed Faculty of Health Sciences, University of Southampton, UK. The purpose of this project is to understand factors related to nurses' behaviour and intentions to comply with the pre-operative skin preparation policy in PSMMC. This project is the first stage in the proposed programme of research, which involves self-completion questionnaires using open-ended questions in order to elicit information about beliefs towards compliance with the pre-operative skin preparation policy among the multicultural nursing workforce at PSMMC. The researcher requests your assistance with this project, which aims to help to ensure the quality and safety of nursing care.

Centre for Innovation and Leadership in Health Sciences

UNIVERSITY OF Southampton

Why have I been chosen?

You are being asked whether you would like to participate in this study because registered nurses constitute the largest professional group employed in PSMMC. The selection of participants for this study focuses on all qualified post probation nurses working in medical surgical unit that performs pre-operative skin preparation practice will being ask to participate.

What will happen to me if I take part?

If you decide to participate you will answer some questions regarding beliefs towards compliance with pre-operative skin preparation practice. This should take less than 15 minutes to complete.

Are there any benefits in my taking part?

No payment will be made for participation or in compensation for any time lost.

Are there any risks involved?

There are no risks attached to your participation in this study.

Will my participation be confidential?

This project is committed to and will abide by the terms of the Data Protection Act. All the information collected by the study will be kept confidential and will be stored in accordance with strict privacy protection procedures. The results of this study will not contain personal identifying information (i.e. the data will be anonymous). All data will be kept securely in a password-protected form by the researcher, and only others who are involved in the data analysis will be eligible to access the data. The research data will be retained for a period of 10 years accordance with the data protection policy at the Faculty of Health Sciences, University of Southampton.

Centre for Innovation and Leadership in Health Sciences

UNIVERSITY OF Southampton

What happens if I change my mind?

You have the right to participate or not, and you will be able to withdraw from the research at any time without giving a reason and without any consequence, even after you have agreed to take part.

What happens if something goes wrong?

If you wish to make a complaint for any reason, if you have any concerns regarding any aspect of your involvement or if you feel that you have been placed at risk, please contact the Research Governance Office at rgoinf@soton.ac.uk or telephone 0044(0)2380595058. You may also contact the Chair of the Ethics Committee at the Faculty of Health Sciences, telephone 0044(0) 2380595578, University of Southampton, Southampton, United Kingdom, SO17 1BJ.

Where can I get more information?

If you have any questions or need more information related to this study, please feel free to contact the following:

1. Ahmed Yami, DClinP student at the Faculty of Health Sciences, University of Southampton. Telephone number: +966502240404. Email: aay2g11@soton.ac.uk
2. Dr. David Voegeli, Faculty of Health Sciences, University of Southampton. Email: D.Voegeli@soton.ac.uk
3. Dr. Margaret Donovan-Hall, Faculty of Health Sciences, University of Southampton. Email: mh699@soton.ac.uk
4. Dr. Bashir L Wilid, Faculty of Health Sciences, University of Southampton. Email: bashir@soton.ac.uk

20/12/2012 [Version 1]

Appendix H :Open-ended Questionnaire (Elicitation Study)

Part I: Demographic Data

Dear participant,

Please would you answer the following questions by putting a tick (✔) in the box that matches your answer.

1. Sex:

1. Male ☐ **2.** Female ☐

2. **Nationality**:

1. Saudi ☐ **2.** Non-Saudi ☐ specify _____

3. Are you aware of the hospital's pre-operative skin preparation policy?

1. Yes ☐ **2.** No ☐

Part II: Concerning the pre-operative skin preparation policy

Please would you provide detailed responses for the following questions? The more you can explain and express your thoughts, the more helpful your responses will be.

1. What do you believe would be the advantages of following the pre-operative skin preparation policy?

2. What do you believe would be the disadvantages of following the pre-operative skin preparation policy?

3. Who do you think would approve or encourage you to follow the pre-operative skin preparation policy?

4. Who do you think would disapprove or discourage you from following the pre-operative skin preparation policy?

5. What factors or circumstances enable you to follow the pre-operative skin preparation policy?

6. What factors or circumstances make it difficult or impossible for you to follow the pre-operative skin preparation policy?

Thank you for your participation.

Appendix I : Covering letter for the second phase study

Centre for Innovation and Leadership in Health Sciences

UNIVERSITY OF Southampton

Dear participants,

I am writing to ask for your collaboration with my Doctorate in Clinical Practice (DClinP) research project. This research requires the use of a questionnaire to understand the perceptions toward compliance participation, and to investigate the psychological determinants that influence the intentions to comply with the pre-operative skin preparation policy amongst the multicultural nursing workforce at Prince Sultan Military Medical City (PSMMC). This research is in partial fulfilment of the requirements for the degree of DClinP in nursing from the Faculty of Health Sciences, University of Southampton.

I would like to invite you to consider participating in a research study by **completing an anonymous questionnaire.** Your participation is entirely voluntary. Therefore, I hope that you will feel comfortable about giving me your honest opinions. You are invited to read the information provided which will tell you about why the study is being conducted and what it would mean if you decided to take part. Your assistance to the research will be provided by your answering the enclosed questionnaire.

Please be aware that your responses will be entirely confidential and I will not know who you are or be able to identify you. It is estimated that the questionnaire will only take 15 minutes to complete. In order to make it convenient and easy for you, a collection box has been placed in the Nursing Administration Department to collect the questionnaires. **Please put the completed questionnaire in the envelope provided and drop it in the collection box, either filled out or left it blank.**

Your participation in this study will be highly appreciated.

Sincerely,

Ahmed Yami
DClinP Student
Faculty of Health Sciences
University of Southampton
Email: aay2g11@soton.ac.uk

Appendix J : Participant Information Sheet

Centre for Innovation and Leadership in Health Sciences

UNIVERSITY OF Southampton

Study Title: Using the Theory of Planned Behaviour to explore the intentions of a multicultural nursing workforce to comply with policies and procedures in Prince Sultan Military Medical City (PSMMC).

Researcher: Mr Ahmed Ali Yami.

Ethics number: 9068

Please read this information carefully before deciding whether or not to take part in this research. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

This project is being undertaken as part of the Doctorate in Clinical Practice (DClinP) programme in nursing at the Faculty of Health Sciences, University of Southampton, UK. This programme is funded by the PSMMC. The funding body will not have access to the data obtained during the project. This doctoral studentship is supervised by Dr. David Voegeli, Dr. Margaret Donovan-Hall and Dr. Bashir Lwaleed Faculty of Health Sciences, University of Southampton, UK.

The purpose of this study is to examine the use of the Theory of Planned Behaviour (TPB) in predicting the intentions of the multicultural nursing workforce to comply with pre-operative skin preparation policy in the PSMMC. This study is the second stage in the proposed programme of research, which involves a self-completion survey using closed-ended questionnaires in order to ascertain whether nurses' intentions toward compliance with pre-operative skin preparation policy are influenced by the TPB variables. The researcher requests your assistance with this study, which aims to help to ensure the quality and safety of nursing care in the Kingdom of Saudi Arabia.

Why have I been chosen?

You are being asked whether you would like to participate in this study because registered nurses constitute the largest professional group employed in PSMMC. All qualified post probation nurses working in medical surgical units that perform pre-operative skin preparation practice will be invited to participate.

What will happen to me if I take part?

If you decide to participate you will answer some questions about your behaviour towards carrying out the compliance with pre-operative skin preparation practice. It should take approximately 15 minutes to complete the questionnaire.

Are there any benefits in my taking part?

No payment will be made for participation or in compensation for any time lost.

Are there any risks involved?

There are no risks attached to your participation in this study.

Will my participation be confidential?

This project is committed to, and will abide by, the terms of the Data Protection Act. All the information collected by the researcher for the study will be kept confidential and will be stored in accordance with strict privacy protection procedures. The results of this study will not contain personal identifying information (i.e. the data will be anonymous). All data will be kept securely in a password-protected form by the researcher, and only others who are involved in the data analysis will be eligible to access the data. The research data will be retained for a period of 10 years in accordance with the data protection policy at the Faculty of Health Sciences, University of Southampton.

What happens if I change my mind?

You have the right to participate or not, and you will be able to withdraw from the research at any time without giving a reason and without any consequences, even after you have agreed to take part.

What happens if something goes wrong?

If you wish to make a complaint for any reason, if you have any concerns regarding any aspect of your involvement or if you feel that you have been placed at risk, please contact the Research Governance Office at rgoinf@soton.ac.uk or telephone 0044(0)2380595058. You may also contact the Chair of the Ethics Committee at the Faculty of Health Sciences, telephone 0044(0) 2380595578, University of Southampton, Southampton, United Kingdom, SO17 1BJ.

Where can I get more information?

If you have any questions or need more information related to this study, please feel free to contact the following:

1. Ahmed Yami, DClinP student at the Faculty of Health Sciences, University of Southampton. Telephone number: +966502240404. Email: aay2g11@soton.ac.uk
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Appendix K : Demographic Questionnaire

Demographic data:

The questionnaire is anonymous; this means it will not be possible to identify you or link any responses to you. Please answer the following questions by filling in the provided space or by putting (✔) in the box that matches your opinion:

1. Age:

☐ 20-30 years ☐ 31-40 years ☐ 41-50 years ☐ >51 years

2. Gender:

☐ Male ☐ Female

3. Nationality:

☐ Saudi ☐ Non-Saudi, specify_____

4. Years of experience:

☐ 1-5 years ☐ 3-5 years ☐ > 5 years

5. Level of education:

☐ Master in Nursing

☐ Bachelor Science in Nursing

☐ Diploma in Nursing

Appendix L : The Theory of Planned Behaviour Questionnaire

Part I: Instructions:

The questionnaire is designed to measure your perceptions toward following the pre-operative skin preparation practices. You will be asked questions which make use of rating scales with seven places. Next to each question is a seven-point rating scale. You need to circle a number in the place on the scale that best describes your opinion. For example, if you were asked to rate the statement " The weather in Riyadh" on such a scale, the seven-point rating scale would be interpreted as follows:

Bad:___1___:___2__:____3____:___4____:___5___ :___6___:___7___:Good
extremely quite slightly neither slightly quite extremely

If you think the weather in Riyadh is quite good, then you would circle the number 6, as follows:

The weather in Riyadh is:

Bad:____1___:___2__:____3____:___4____:___5___ :__(6)__:___7___:Good

If you think the weather in Riyadh is extremely bad, then you would circle the number 1, as follows:

The weather in Riyadh is:

Bad:___(1)__:___2__:____3____:___4____:___5___ :___6___:___7___:Good

Part II: The Theory of Planned Behaviour Questionnaire:

Please answer the following questions by circling the number that best describes your opinion. Some of questions may appear similar, but there are actually subtle differences in what is being asked. Your opinions and perceptions are valued.

1. For me, following pre-operative skin preparation policy would be:

Bad:____ 1____:___2 ____:___3 ___:__ 4__:___5___:__6__:__7___:Good

Uesless:___1___:__2 __:___3___:__4___:___5___:__6___:___7___:Useful

Harmful:___1___:__2 __:___3___:__4___:___5___:__6___:__7___:Beneficial

Unpleasant:___1___:__2 __:___3___:__4___:___5___:__6___:__7___:Pleasant

2. Most of the people who are important to me think that I

Should not:___1__:__2__:__3__:__4__:__5__:__6__:__7___:Should
follow the pre-operative skin preparation policy.

3. It is expected of me that I follow the pre-operative skin preparation policy.

Extremely unlikely:__1__:_2__:__3__:__4__:__5__:_6__:_7__:Extremely likely

4. The people in my life whose opinions I value would_____of my following pre-operative skin preparation policy.

Disapprove:___1__:__2__:__3__:__4__:__5__:__6__:__7___:Approve

5. I am confident that I could follow the pre-operative skin preparation policy.

Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

6. For me to follow the pre-operative skin preparation policy would be

Difficult:___1__:__2__:__3__:__4__:__5__:__6__:__7___:Easy

7. How much control do you believe you have over following pre-operative skin preparation policy?

No control:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Complete control

8. Whether or not I follow the pre-operative skin preparation policy is completely up to me

   Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

9. I intend to follow the pre-operative skin preparation policy

   Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

10. I plan to follow the pre-operative skin preparation policy

    Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

11. I am determined to follow the pre-operative skin preparation policy

    Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

12. My following pre-operative skin preparation policy would prevent patients from the risk of infection:

    Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

13. My following pre-operative skin preparation policy would improve quality of patient care:

    Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

14. My following pre-operative skin preparation policy would avoid delaying or cancelling the surgical procedure:

    Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

15. Following pre-operative skin preparation policy may cause skin injury to patient:

    Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

16. My follow pre-operative skin preparation policy using protective equipment (i.e. gloves) would increase my chance of getting a skin irritation:

    Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

17. Preventing patients from the risk of infection is:

    Extremely bad:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Extremely good

18. To me, improving quality of patients care is:

Extremely bad:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Extremely good

19. Avoiding delay or cancelling the surgical procedure is:

Extremely bad:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Extremely good

20. To me, causing skin injury to the patient as result of following pre-operative skin preparation policy is:

Extremely bad:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Extremely good

21. To me, increasing my chance of get a skin irritation is:

Extremely bad:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Extremely good

22. Doctors think that I_____follow the pre-operative skin preparation policy.

Should not:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Should

23. When it comes to following pre-operative skin preparation policy, how much do you want to do what your doctors think should do?

Not at all:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Very much

24. My head nurse thinks that I_____follow the pre-operative skin preparation policy.

Should not:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Should

25. When it comes to following pre-operative skin preparation policy, how much do you want to do what your head nurse thinks should do?

Not at all:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Very much

26. My charge nurse thinks that I_____follow the pre-operative skin preparation policy.

Should not:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Should

27. When it comes to following pre-operative skin preparation policy, how much do you want to do what your charge nurse thinks should do?

Not at all:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Very much

28. My colleagues think that I_____follow the pre-operative skin preparation policy.

Should not:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Should

29. When it comes to following pre-operative skin preparation policy, how much do you want to do what your colleagues think you should do?

Not at all:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Very much

30. My patient thinks that I_____ follow the pre-operative skin preparation policy.

Should not:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Should

31. When it comes to following pre-operative skin preparation policy, how much do you want to do what your patient thinks you should do?

Not at all:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Very much

32. The relatives of my patient think that I_____follow the pre-operative skin preparation policy.

Should not:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Should

33. When it comes to following pre-operative skin preparation policy, how much do you want to do what your patients' relatives think you should do?

Not at all:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Very much

34. I expect that my following pre-operative skin preparation policy would require support and encouragement to follow pre-operative skin preparation policy.

Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

35. Support and encouragement would make it_____ for me to follow pre-operative skin preparation policy.

Much more difficult:__1__:__2__:__3__:__4__:__5__:__6__:__7_:Much easier

36. I think that my following pre-operative skin preparation policy would require financial incentives to follow pre-operative skin preparation policy.

Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

37. The financial incentives would make it_____for me to follow pre-operative skin preparation policy.

Much more difficult:_1__:__2__:__3__:__4__:__5__:__6__:__7__:Much easier

38. I expect that a higher level of clinical experience would enable me to follow pre-operative skin preparation policy.

Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

39. For me, a higher level of clinical experience would make it_____to follow pre-operative skin preparation policy.

Much more difficult:_1__:__2__:__3__:__4__:__5__:__6__:__7__:Much easier

40. I expect that the issue of respecting a patients' privacy would prevent me from following pre-operative skin preparation policy.

Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

41. To me, respecting a patients' privacy would make it_____ to follow pre-operative skin preparation policy.

Much more difficult:_1__:__2__:__3__:__4__:__5__:__6__:__7__:Much easier

42. I think that my following pre-operative skin preparation policy would raise my workload by following pre-operative skin preparation policy.

Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

43. To me, the workload would make it_____ to follow pre-operative skin preparation policy.

Much more difficult:_1__:__2__:__3__:__4__:__5__:__6__:__7__:Much easier

44. I expect that lack of equipment availability would prevent me from following pre-operative skin preparation policy.

Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

45. The lack of equipment available for the pre-operative skin preparation policy would make it_____ for me to follow pre-operative skin preparation policy.

Much more difficult:_1__:__2__:__3__:__4__:__5__:__6__:__7__:Much easier

46. I expect that nurses' shortage would prevent me from following pre-operative skin preparation policy.

Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

47. Nurse' shortage would make it _____ for me to follow preoperative skin preparation policy.

Much more difficult:_1__:__2__:__3__:__4__:__5__:__6__:__7__:Much easier

48. I think that lack of time would prevent me from following pre-operative skin preparation policy.

Strongly disagree:__1__:__2__:__3__:__4__:__5__:__6__:__7__:Strongly agree

49. To me, the time availability would make it_____ to follow pre-operative skin preparation policy.

Much more difficult:_1__:__2__:__3__:__4__:__5__:__6__:__7__:Much easier

Thank you for your time in completing this survey.

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