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An empirical investigation into the relationship between emotional processing and tinnitus distress

by

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ABSTRACT

FACULTY OF HEALTH SCIENCES

Thesis for the degree of Doctor of Clinical Practice

AN EMPIRICAL INVESTIGATION INTO THE RELATIONSHIP BETWEEN EMOTIONAL PROCESSING AND TINNITUS DISTRESS

Susan McCormack

For many people, living with tinnitus is a highly distressing experience. Theoretical models have identified a number of factors to explain why some individuals experience distress while others do not. However, there is no agreement on the psychological processes involved. This study has introduced emotional processing as an explanatory concept for the experience of persistent tinnitus distress. Emotional processing involves active engagement with and expression of emotions in order to cope successfully with life events. The Emotional Processing Model (EPM) identifies a range of emotional behaviours or emotional processing styles which promote or inhibit emotional processing.

The survey study measured emotional processing using the Emotional Processing Scale (EPS-25) with 47 adult participants referred to an NHS Trust's Audiology Outpatient Clinics for tinnitus assessment. The data collected were analysed to assess the extent of the relationship between specific emotional processing deficits and tinnitus distress and to determine if the age and gender of participants and the duration of their tinnitus were contributory factors to tinnitus distress. The results indicated that individuals who are distressed by their tinnitus process their emotions less effectively than those who are not distressed and that, of the contributory variables examined, poor emotional processing was found to be the single significant explanatory factor for their tinnitus distress.

Interviews were subsequently held with a small sample of other people who experienced tinnitus distress to explore their experiences and the relationship between emotional processing and tinnitus distress. The findings supported the results of the survey study. Taken together, the study has contributed to the understanding of tinnitus distress with the introduction of the EPM and the EPS-25 and has generated new knowledge to inform future therapeutic interventions and the research agenda.

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DECLARATION OF AUTHORSHIP

I, ...

declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

An empirical investigation into the relationship between emotional processing and tinnitus distress

.....

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. 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;
5. I have acknowledged all main sources of help;
6. 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;
7. None of this work has been published before submission;

Signed: .....

Date: .....

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Finally, I would like to thank my late father, John Anthony McCormack, who inspired me to be curious about the world, to keep learning and to accomplish valued goals in life despite challenges to their achievement.

Definitions and Abbreviations

Avoidance factor

Assesses the tendency to avoid exposure to emotionally distressing experiences

Controllability of emotion factor

Assesses the experience of externally orientated powerful emotions involving high arousal, agitation and anger

Emotional experience factor

Measures the predisposition to poor emotional awareness and restricted emotionality

Emotional processing

A process whereby emotional disturbances are absorbed and decline to the extent that other experiences and behaviour can proceed without disruption (Rachman, 1980)

Signs of unprocessed emotion factor

Captures when emotions have not been processed adequately by assessing the experience of persistent intrusive distressing feelings

Suppression factor

Evaluates the propensity to suppress emotional experiences and to control expression of emotions

The Emotional Processing Model

A process model which identifies the specific psychological mechanisms which inhibit emotional processing of a stimulus or event (Baker, 2001)

The Emotional Processing Scale

A five factor self-report measure which assesses the mechanisms and processes involved in emotional processing and whether there are signs of emotional unprocessed emotional material (Baker *et al.*, 2010). The five factors reflect different dimensions of emotional control which inhibit emotional processing. The EPS cannot be included in the thesis as a result of copyright issues.

AAQ-9 The Acceptance and Action Questionnaire (Hayes *et al.*, 2004)

ACT Acceptance and Commitment Therapy

ANS Autonomic nervous system

AS Anxiety sensitivity

ASI The Anxiety Sensitivity Index (Reiss *et al.*, 1986)

ASI-3 The Anxiety Sensitivity Index-3 (Taylor *et al.*, 2007)

BAA The British Academy of Audiology

BATS The Brief Assessment of Tinnitus Severity (Croft *et al.*, 2013a)

BDI The Beck Depression Inventory (Beck *et al.*, 1961)

BFI-10 The German version of the Big Five Inventory (Rammstedt and John, 2007)

BTA The British Tinnitus Association

CASP Critical Appraisal Skills Programme

CBM The Cognitive-Behavioural Model of tinnitus distress

CBT Cognitive Behavioural Therapy

CECS The Courtauld Emotional Control Scale (Watson and Greer, 1983)

CPAQ-R The Chronic Pain Acceptance Questionnaire-Revised (McCracken *et al.*, 2004)

DASS The Depression and Anxiety and Stress Scale-21 (Lovibond and Lovibond, 1995)

DS14 The Type D Personality Scale (Denollet, 2005)

EIS The Emotional Intelligence Scale (Schutte *et al.*, 1998)

EPM The Emotional Processing Model (Baker, 2001)

EPQ The Eysenck Personality Questionnaire (Eysenck and Eysenck, 1975)

EPS-25 The Emotional Processing Scale (Baker *et al.*, 2010)

EPS-38 The pilot version of the EPS-25

FTQ The Fear of Tinnitus Questionnaire (Cima *et al.*, 2011)

GHQ The General Health Questionnaire-12 (Goldberg and Williams, 1988)

HADS The Hospital Anxiety and Depression Scale (Zigmond and Snaith, 1983)

IPQ-R The Illness Perception Questionnaire-revised (Moss-Morris *et al.*, 2002)

MAS The Bendig Version of the Taylor Manifest Anxiety Scale (Bendig, 1956)

NA Negative affectivity

PCA Principal Components Analysis

PRISMA Preferred Reporting Items for Systematic Reviews and Meta-Analyses

QOLI The Quality of Life Inventory (Frisch *et al.*, 1992)

sAD The Personal Disturbance Scale (Henry *et al.*, 2002)

SF36 The RAND 36-item Health Survey (Hays *et al.*, 1993)

SI Social inhibition

STAI The State-Trait Anxiety Inventory (Spielberger *et al.*, 1970)

TAQ The Tinnitus Acceptance Questionnaire (Westin *et al.*, 2008)

TAS-BT The Tinnitus-related Fear Avoidance Behaviour factor of the T-FAS

TAS-20 The Toronto Alexithymia Scale (Bagby *et al.*, 1994)

TCS The Tinnitus Catastrophizing Scale (Cima *et al.*, 2011)

TCSQ The Tinnitus Coping Style Questionnaire (Budd and Pugh, 1996)

TEQ The Tinnitus Experience Questionnaire (Croft, 2008)

T-FAS The Tinnitus Fear-Avoidance Cognitions and Behaviours Scale (Kleinstauber *et al.*, 2013)

THI The Tinnitus Handicap Inventory (Kuk *et al.*, 1990)

THS The Tinnitus Habituation Scale (Croft *et al.*, 2013b)

TQ The Tinnitus Questionnaire (Hallam *et al.*, 1988)

TRQ The Tinnitus Reaction Questionnaire (Wilson *et al.*, 1991)

TRS The Tinnitus Response Scales (Croft *et al.*, 2013a)

TRT Tinnitus Retraining Therapy

TSS The Tinnitus Severity Scale (Sirois *et al.*, 2006)

TVAQ The Tinnitus Vigilance and Awareness Questionnaire (Cima *et al.*, 2011)

Chapter 1: Introduction

1.1 Introduction

This study concerns why some individuals who experience ear and head noises, known as tinnitus, find them distressing yet others do not. The aim of the study was to investigate if the way an individual processes experiences in life could explain the development and persistence of tinnitus distress. The study introduces the concept of emotional processing and considers its association with tinnitus distress. This chapter introduces the rationale for the study. It will present the concept of emotional processing and my personal background and reasons for undertaking the study, which together provide support for the applicability of emotional processing as an explanatory concept for the experience of tinnitus distress.

1.2 The experience of tinnitus

Tinnitus is one of the most common physical conditions (Davis and El Rafaie, 2000). The phenomenon of tinnitus is defined as the perception of internal sound or sounds (Lockwood *et al.*, 2002). The most common sounds reported are ringing, buzzing and hissing (Meikle and Taylor-Walsh, 1984) and some individuals describe their tinnitus as a combination of multiple sounds (Douek, 1981) and others experience hearing music (Teunisse and Olde Rikkert, 2012).

While multiple mechanisms and changes at all levels of the auditory pathway have been proposed for tinnitus generation there is a consensus that tinnitus perception results from the prioritisation of neural signals by auditory and attentional systems in the brain (Henry *et al.*, 2014). Risk factors identified include mechanical changes in the middle ear, cochlear trauma caused by noise exposure, ototoxic drugs and head injury, lesions on the auditory nerve, rheumatoid arthritis, cardiovascular disease and diabetes (Nondahl *et al.*, 2011; Langguth *et al.*, 2013). Numerous medical treatments have been tried in an attempt to cure or alleviate tinnitus but few have any long term beneficial effect (Baguley *et al.*, 2013) and so, for the most part, the perception of such sounds cannot be eliminated.

Prevalence studies indicate that tinnitus is a common problem in the general population. Prevalence figures of tinnitus in the adult population obtained from European studies range from 14.5% (Quaranta *et al.*, 1996) (Italy) to 22% (Hannaford *et al.*, 2005) (U.K.). In the Western Pacific area prevalence has been reported as 20.7% (Xu *et al.*, 2011) (China) and 21.4% in South Korea (Park and Moon, 2014). In the region of the Americas prevalence figures range from 22% (Oiticica and Bittar, 2015) (Brazil) to 25.4% (Shargorodsky *et al.*, 2010) (USA) and reported in Egypt as 10.1% (Khedr *et al.*, 2010).

Following the onset of tinnitus, whilst many individuals do not experience negative emotional consequences, there are a significant number of individuals for whom tinnitus is the source of severe emotional distress which does not dissipate over time. To date, there is no consensual theory to explain what distinguishes those individuals who can cope with their tinnitus from those who experience ongoing emotional distress. Therefore, the phenomenon of tinnitus distress remains a challenge for both researchers and clinicians.

Similarly, whilst the majority of individuals successfully absorb events or situations which occur in life and are able to proceed without disruptions to their wellbeing, some individuals are distressed by such events at their onset and continue to be emotionally troubled. An exploration of the mechanisms which inhibit the emotional processing of such experiences could provide an innovative explanatory and cohesive perspective for the development and maintenance of tinnitus distress.

1.3 The concept of emotional processing

The concept of emotional processing was developed to explain why emotional distress occurs at the time of an event and the processes through which such distress can be maintained. In his theory of emotional processing, Rachman (1980) asserted that active engagement with emotions and the expression of emotions are necessary for successful coping with life events. Conversely, vulnerability to negative thinking and emotional behaviours such as avoiding or suppressing emotions will inhibit emotional processing, the process whereby psychological disruptions associated with an event are resolved. Rachman (2001), some two decades later, further identified signs of incomplete emotional processing which are physical arousal, characterised by irritability, persistent distressing intrusive thoughts and feelings, fear and excessive avoidance of the

source of distress. Of relevance to this thesis, these persistent symptoms discussed in the emotional processing literature are also reported by individuals who are distressed by their tinnitus yet, to date, the relationship between emotional processing and tinnitus distress has not apparently been investigated. Building on the work of Rachman (1980), the construct of emotional processing has been conceptualised within the components of the Emotional Processing Model (EPM) (Baker, 2001).

1.4 Overview of the Emotional Processing Model

The Emotional Processing Model was developed to explain the psychological mechanisms involved in processing life events or situations. The EPM comprises of three stages where the control of emotion is represented in all stages. The first stage relates to an event, trigger or stimulus that requires emotional processing. The second stage concerns the emotional experience which follows the event. The final stage relates to the expression of the emotional experience. The model identifies that the person's pre-existing patterns of responding to situations or schemas will influence the perceived consequences of the event or stimulus, the emotion experienced and the control and expression of emotion. Emotional processing may therefore help to explain the varying impact of life experiences on different individuals. The EPM provided the framework for the identification and assessment of unhealthy emotional processing styles which could enable therapists to integrate an emotional processing component into therapeutic interventions. The influence on emotional processing of dimensions of emotional control identified in the EPM is supported by my own clinical experiences and observations which are described in the personal background to the study.

1.5 Personal background to the study

The inspiration for the study came from my work as a Tinnitus Therapist. The aim of tinnitus therapy is to enable people to adapt to living with the experience of tinnitus. In my work, I adopted Egan's (1990) client centred approach to explore patients' narratives about their situation surrounding the onset of tinnitus through to their current experience. This approach also explores the strategies people employ to cope with tinnitus in order to identify patterns of maladaptive thoughts, emotions and behaviours. My clinical experience established for me that there were differences in the way patients talked about their emotional

experiences in life and in relation to their tinnitus. Those patients who were most distressed by their tinnitus were not able to readily identify their emotions in general and more specifically in relation to their tinnitus. They also exerted excessive generalised emotional control and adopted avoidance strategies concerning the experience of tinnitus and their feelings surrounding tinnitus. My observations suggested that an individual's approach to emotional experiences may play an important role in the development and maintenance of tinnitus distress. From this, I considered that the identification of these emotional dispositional styles within a conceptual framework could inform therapeutic interventions for people who experience tinnitus distress.

Given that conceptual models of tinnitus have not, to date, identified the specific role of the person's approach to emotional experiences as predictors of tinnitus distress, I undertook a literature search beyond the context of tinnitus research. Within the domain of psychology, the theory of emotional processing (Rachman, 1980) and the Emotional Processing Model (EPM) (Baker, 2001) were identified as explanatory conceptual perspectives for my clinical observations. From the outset of the study the concept of emotional processing, the EPM and the measurement of emotional processing by means of the Emotional Processing Scale (EPS) (Baker *et al.*, 2007) provided its conceptual framework.

As the EPM has not hitherto been applied to the investigation of tinnitus distress, and as its symptoms (see section 2.2.1) are signs of unprocessed emotion, this study sought to progress the understanding of tinnitus distress by exploring the role of emotional processing in people who experience tinnitus related distress.

1.6 Research aim and research question

The aim of the study was to investigate if the experience of tinnitus distress can be explained by certain patterns of emotional processing identified within the theoretical framework of the EPM. It is anticipated that the findings of the study will inform clinical practice as well as indicate further areas for research. In order to meet this aim and expected outcomes the following research question has guided the study.

What is the relationship between emotional processing and tinnitus distress?

The study used self-report measures of emotional processing and tinnitus distress to investigate the association between these constructs. Interviews were

then conducted which elicited the experiences surrounding tinnitus in a further sample of people who reported tinnitus distress.

1.7 Overview of the thesis chapters

The structure of the thesis is as follows. This chapter has introduced the rationale for the study. It has presented the concept of emotional processing, an overview of the EPM and my personal background and reasons for undertaking the study. Together, these informed the study's aim and research question. Chapter 2 presents the context of the study. First, it describes the symptoms, diagnosis and assessment of tinnitus distress, its prevalence and current explanations and treatment approaches. It then provides the theoretical context by introducing the Emotional Processing Model (EPM) and the tool developed from the model to measure emotional processing - the EPS-25. Finally, it considers the existing knowledge which relates to the constructs presented in the EPM and their relationship with health disorders.

Chapter 3 reviews the literature around the theoretical constructs relating to tinnitus which implicate the role of emotional processing and components of the EPM in the development and maintenance of tinnitus distress. Gaps in knowledge are identified from which the aim of the study and the research question were further developed.

Chapter 4 presents the research methodology in terms of the study design, the population and sample, the methods of data collection, namely the questionnaire measures and interviews, the approach to the analysis of the data and a consideration of ethical and access issues. Chapter 5 gives the results from the analysis of the questionnaire data. The findings from the interviews which concerned the emotional experiences surrounding tinnitus, gained from a further sample of people who reported tinnitus distress, are presented in Chapter 6.

Chapter 7 constitutes the discussion of the study's findings in relation to the study's aim and research question. The contribution of the findings to the current understanding of tinnitus distress and the applicability of the EPM as an explanatory framework for tinnitus distress are considered. Chapter 8 presents the conclusions drawn from the study's findings and their implications for clinical practice and a future research agenda.

Chapter 2: Tinnitus Distress and Emotional Processing

2.1 Introduction

This chapter presents the background to the study where the clinical diagnosis and assessment of tinnitus distress, its prevalence and its consequences are described. This highlights the highly detrimental and far-reaching impact of tinnitus distress on the quality of life for many individuals. Existing theoretical explanations for tinnitus distress and its treatment are presented, establishing that, at present, there is no consensus regarding the mechanisms involved in the generation and maintenance of tinnitus distress. Furthermore, current NHS treatment approaches reflect diverse explanatory theoretical perspectives. The chapter goes on to provide the theoretical context for the conduct of the study by describing the Emotional Processing Model (EPM) and the tool developed from the model to measure emotional processing - the EPS-25. Finally, it considers current knowledge relating to the constructs presented in the EPM and their relationship with health disorders in order to evaluate its applicability to the context of tinnitus research.

2.2 Tinnitus distress

2.2.1 Symptoms

Emotional distress is the most commonly reported adverse consequence of the experience of tinnitus (Zoger *et al.*, 2001). It is characterised by a wide range of symptoms such as physiological arousal, low mood, anger, irritability, despair, sadness and fear of the effect of tinnitus on mental wellbeing (Hallam *et al.*, 1984).

Physiological arousal associated with tinnitus distress has been considered as a predictor of chronic sleep disorders (Miguel *et al.*, 2014). Arousal levels have also been implicated in selective attention problems and cognitive interference which impact on daily functioning and quality of life (Andersson *et al.*, 2000). Impaired social and occupational performance and life enjoyment are also commonly experienced (Kennedy *et al.*, 2004; Khedr *et al.*, 2010).

The exploration of the experiences of those individuals who are distressed by their tinnitus has received very little research attention. However, there have been two qualitative studies which have described the consequences of tinnitus on both physical and emotional well-being (Andersson and Edvinsson, 2008; Dauman and Erlandsson, 2012). These both reported that the fear that tinnitus will affect future mental health was a dominant finding. Similarly, self-report measures of tinnitus distress derived from clinical interviews have captured the extent and the intensity of emotional distress associated with tinnitus. These experiences are demonstrated in statements such as "I worry that the noise will give me a nervous breakdown", "if the noise continues my life will not be worth living" (Hallam *et al.*, 1988) "my tinnitus has led me to despair" and "my tinnitus has made me feel tormented" (Wilson *et al.*, 1991). These studies, and the clinical observations which informed the development of such measures, confirm that tinnitus distress has significant consequences on the lives of many individuals.

2.2.2 Diagnosis and assessment

The experience of psychological distress associated with tinnitus and its impact on the person's life are usually explored as part of the overall diagnostic assessment of tinnitus in clinical practice. Whilst, to date, there has been no agreement on the protocol for its assessment in clinical and research communities (Baguley *et al.*, 2013), self-report measures of patients' reactions to their tinnitus are increasingly used in the management of tinnitus patients (Meikle *et al.*, 2008). A number of instruments include dimensions such as the social consequences of tinnitus (Kuk *et al.*, 1990) or related complaints for example, its interference with hearing (Hallam *et al.*, 1988). A further measure, the Tinnitus Reaction Questionnaire (TRQ) (Wilson *et al.*, 1991), is widely used as it was designed specifically to measure tinnitus distress. The TRQ was used in the current study and a full description of the instrument is presented in Chapter 4.

2.2.3 Prevalence

The most comprehensive study into the prevalence of tinnitus in the UK reported that 10.1% of adults, in a sample of 48,313 participants drawn from the general population, experienced prolonged tinnitus (Davis and El Rafaie, 2000). In this study, tinnitus was reported to be moderately annoying by 2.8% of the total sample, and to be severely annoying by 1.6%. In 0.5% of the sample, tinnitus was said to have a severe effect on the ability to lead a normal life. Thus,

approximately one adult in ten experiences ongoing tinnitus and around 5% of people experience a degree of tinnitus distress, ranging from mild annoyance to debilitation. The findings of this study are congruent with international tinnitus prevalence studies conducted by Axelsson and Ringdahl (1989) and Parving *et al.* (1993) in Scandinavia. Overall, these studies confirm that tinnitus distress is experienced by a large proportion of those people with prolonged tinnitus and, for a smaller but significant number, their lives are seriously disrupted.

2.2.4 Current explanations and treatment approaches

Given the evidence of the symptoms and impact of tinnitus distress outlined above, researchers and clinicians have sought to understand the physiological and psychological mechanisms which underpin the generation and maintenance of this distress. A range of different theories have emerged which have informed clinical practice. An overview of the explanatory models of tinnitus distress currently used in clinical practice, developed from such theoretical perspectives, and their respective therapeutic applications are now presented and their limitations considered.

2.2.4.1 The neurophysiological model of tinnitus distress

The neurophysiological model, first presented by Jastreboff (1990), asserts that at onset, tinnitus is perceived as a neutral auditory stimulus which only becomes problematic when it is associated with something negative such as stressful life events which initiate psychological distress. The model suggests that, through a process of conditioning, learned associations between stimuli and responses are formed which result in the generation and maintenance of tinnitus distress.

The negative emotional state elicited by the event and generated by the brain's limbic system, which plays a role in emotion, memory and learning, activates the autonomic nervous system (ANS), preparing the body for flight or fight to deal with threat. The model proposes that feedback loops are then instigated between these systems and the auditory perception system. The negative emotional reactions and ANS responses to the event become associated with the sound so that the neutral stimulus of tinnitus is given a negative emotional significance which initiates tinnitus distress. Reinforcement of the negative experience of tinnitus is established by its association with such emotional and ANS responses, and thus tinnitus distress is maintained.

The development of this model represented a major contribution to the understanding of tinnitus which identified emotional processing at a subconscious level as a major factor in generating tinnitus distress. Criticism has, however, been levelled with regard to its lack of clarity concerning the role of cognition and its explanation of tinnitus distress as a conditioned response to the tinnitus stimulus (McKenna, 2004; Baguley *et al.*, 2013). While the role of cognition is not acknowledged and the model stresses the importance of unconscious conditioning, it asserts that negative beliefs about tinnitus can supply negative reinforcement which suggests the involvement of cognitive processes.

According to Rachman (1977), conditioning does not offer a plausible explanation for fear responses and there is little evidence to suggest that people can be conditioned to have a lasting fear of a neutral stimulus. Further, given the prevalence of phobias in comparison to the population who experience tinnitus distress, McKenna (2004) suggested that the tinnitus sound represents a stimulus with a low level of preparedness for conditioning. Also, evidence indicates that the onset of tinnitus is not always associated with psychological distress relating to a specific event (Meric *et al.*, 1998).

Despite its limitations, the neurophysiological model has led to the development of a treatment protocol called Tinnitus Retraining Therapy (TRT) (Jastreboff and Hazell, 1993) which aims to achieve habituation to tinnitus by a two stage process. The first element of TRT is termed ‘directive counselling’, involving the explanation of the patient’s experience of tinnitus in the context of the model. This aims to enable the patient to view it as a benign experience, thus reducing ANS activation and decreasing the negative reinforcement of the continuous stimulus so lessening the strength of the conditioned response. However, despite the assertion that cognitive elements are not important in TRT, the aim of the component includes facilitating the patient’s reappraisal of tinnitus.

The second component is sound therapy, which aims to increase background noise, thereby diminishing the contrast between it and the tinnitus. Thus the perceived intensity of the tinnitus noise is decreased which, it is asserted, then reduces the activation of the ANS and the other systems involved, thus removing the negative emotions associated with tinnitus. Despite its wide use in NHS tinnitus clinics, there is little robust evidence regarding the efficacy of Tinnitus Retraining Therapy (Phillips and McFerran, 2010).

In addition, where the sound therapy component alone is provided for patients who report sleep disturbance, a primary symptom of tinnitus distress, the evidence indicates that sound therapy without counselling offers no benefits to the alleviation of their distress (McKenna and Irwin, 2008).

2.2.4.2 The habituation model of tinnitus distress

In contrast to the neurophysiological model, other researchers and clinicians have recognised the central role of cognitive processes in determining tinnitus distress (Baguley *et al.*, 2013). One of the most influential perspectives has been the habituation model, first proposed by Hallam *et al.* (1984). This model asserts that high levels of arousal or stress reduce the ability to ignore the sound thereby creating a feedback loop which increases tinnitus attention and hence arousal. This generates and maintains negative emotional responses thus diminishing habituation. The precise details about specific cognitive processes involved in tinnitus detection and distress were not, however, explained by the researchers.

Criticism of the model has been voiced in terms of its conceptual limitations. According to McKenna (2004), the model is essentially one of linear processing of cognitive information. This is where the detection of tinnitus leads to unhelpful automatic thoughts which promote arousal and subsequent emotional distress. However, the model does not explain other observable aspects of tinnitus distress such as avoidance behaviours. Further, it does not refer to deeper cognitive structures or core beliefs and schemas which may influence the tinnitus experience, identified by Beck (1996) as cognitive, emotional and behaviour systems to explain emotional disorders.

Despite these limitations, the habituation model has been highly influential in one approach to tinnitus therapy, that of Cognitive Behavioural Therapy (CBT). CBT is the most widely used psychological intervention for tinnitus distress (Greimel and Kröner-Herwig, 2011). The core elements of the CBT modality are first, education about the nature of tinnitus, the process of habituation where tinnitus no longer has an emotional significance and the role of stress arousal which impedes habituation. The second element is relaxation training to enable a reduction in the physiological and psychological symptoms associated with tinnitus. Third, there is a cognitive component which helps the person to understand the central role of thought and how to identify and change their thoughts in order to find a more helpful and therefore less threatening meaning of tinnitus. This approach considers that the re-structuring of thoughts surrounding tinnitus enables the

reappraisal of the significance of tinnitus and the resolution of tinnitus related distress (McKenna *et al.*, 2014). However, in the context of emotional processing therapy, Baker and colleagues (2013) proposed that it is not necessary to have a cognitive perspective or to attempt to modify cognitions. The authors suggested that cognitive changes are an automatic consequence of the activation of emotions surrounding an adverse event or situation.

While the results of a systematic review and meta-analysis of randomized controlled trials of CBT indicated that it is an effective treatment in reducing annoyance and distress associated with tinnitus (Hesser *et al.*, 2011), the emphasis here is on the modification of maladaptive cognitions rather than emotional behaviours to achieve habituation. In contrast to the aim of the CBT approach, where the modification of maladaptive cognitive and emotional response alleviates tinnitus distress, a further theoretical perspective, that is experiential avoidance theory (Hayes *et al.*, 1996), suggests that attempts to change the experience of such responses will maintain psychological distress.

2.2.4.3 Acceptance-based theory

Acceptance has been put forward as a further psychological construct that may explain why, for many individuals, the perception of the tinnitus sound does not result in persistent distress (Andersson and Edvinsson, 2008; Westin *et al.*, 2008; Croft *et al.*, 2013a; Croft *et al.*, 2013b; Hesser *et al.*, 2015). Acceptance is considered a process of experiencing bodily sensations, thoughts and feelings without having to change them even in the presence of negative experiences (Hayes *et al.*, 1999). The construct of acceptance considers that being open to unpleasant feelings engenders greater self-understanding and thus, the ability to identify and carry out behaviours that reflect personal goals which creates a sense of wellbeing and acceptance of these internal events. It is closely linked to its opposite psychological process, that of experiential avoidance, where, according to Hayes *et al.* (1996), avoidance of unwanted internal sensations, thoughts and feelings reinforces their emotional significance thus, it is associated with persistent psychological distress.

Recent trends within CBT have focused on approaches which aim to increase acceptance of distressing thoughts, emotions and bodily sensations (Hayes *et al.*, 1999) referred to as the ‘Third wave’ of cognitive therapy. There are two conceptually overlapping approaches - Acceptance and Commitment Therapy (ACT) and Mindfulness Based Cognitive Therapy. The emerging evidence suggests

that that these treatment modalities are effective (Sadlier *et al.*, 2008; Westin *et al.*, 2011). However, both are complex interventions with many components. The efficacy of individual components such as training to improve emotional awareness and enhancing emotional engagement, is not known.

2.2.4.4 The cognitive-behavioural model

In his review of the neurophysiological and habituation models McKenna (2004) identified a number of their limitations. From this, he sought to advance understanding of tinnitus distress by drawing on models of distress associated with other conditions. Specifically, he examined a family of cognitive-behavioural models that had been developed to account for emotional distress associated with conditions such as chronic pain (Sharp, 2001) and insomnia (Harvey, 2002). From this he identified that negative cognitive activity, beliefs and avoidance behaviours were implicated in the maintenance of distress and used this understanding to inform the development of the cognitive-behavioural model of tinnitus distress (CBM) (McKenna *et al.*, 2014). The model suggests that the process of distress starts when the person experiences intrusive overly negative thoughts when they detect tinnitus; for example, these could be negative appraisals about the consequences of tinnitus for future coping and mental wellbeing. Such negative thoughts then trigger autonomic arousal and emotional distress. The consequence of such thinking and increased arousal is to magnify the perception of tinnitus and attention to it. If this increases the perceived threat of the sound, then a maintaining cycle is established. McKenna *et al.* suggested that the precise process underpinning this component of the model requires further consideration but it could be that sustained attention is motivated by a hyper-vigilant state. Informed by Beck's (1996) personality theory, McKenna *et al.* further asserted that the predisposition to negative core beliefs and emotions and the tendency to inhibit emotional expression to others, may predict the vulnerability to tinnitus distress. However, emotional schemas are not included within the components of the model.

Following a fearful appraisal of the consequences of tinnitus, the model suggests that actions, described as safety behaviours (Salkovskis, 1991), are taken to avoid such dysfunctional thinking. The behaviours may be overt actions or internal actions such as attempts to avoid tinnitus related thoughts. The implication of adopting escape actions is that the reappraisal of underpinning cognitions is prevented, thus maintaining emotional distress. According to McKenna *et al.*,

further development of the model is intended in order that it may lead to the development of a more successful approach to therapy.

While the model is consistent with the psychological processes identified in other theoretical perspectives and empirical evidence, there is an omission from it. One of the models which informed the development of the CBM, Harvey's (2002) model of insomnia, asserted that persistent invasive distressing emotions and elevated arousal at the pre-sleep period could be accounted for by incomplete emotional processing of daytime emotional material. The role of emotional processing is therefore identified as significant to the resolution of distress in Harvey's model. Whilst McKenna *et al*. suggested the disposition to emotional inhibition may be implicated in persistent tinnitus distress which is consistent with the concept of emotional processing, such patterns of behaviour are not represented in their model's components. Given that, according to Lumley *et al*. (2011), emotional processing strongly influences emotional distress relating to physical health disorders, an examination of the concept of emotional processing could shed further light on the understanding of tinnitus distress.

Overall, the diverse models and theories presented confirm that there is no agreement on the mechanisms involved in the generation and maintenance of tinnitus distress. Currently there are no UK-produced practice guidelines for the therapeutic management of tinnitus (Hoare, 2015) which reflects the lack of consensus concerning best practice. Therefore, a treatment protocol based on a theoretical perspective that reflects a more cohesive framework for tinnitus distress is needed.

2.3 Theoretical framework for the study

As discussed in chapter 1, the EPM has not hitherto been applied to the investigation of tinnitus distress. This study sought to progress the understanding of tinnitus distress by exploring the role of emotional processing in people who experience tinnitus related distress. In the following sections, the EPM is described along with the EPS-25, the assessment tool for emotional processing developed from the EPM which, together, provide the theoretical framework for the study.

2.3.1 The Emotional Processing Model

The EPM was developed through a programme of research around panic disorder carried out by the clinical psychologist, Roger Baker. During therapeutic interventions with people who experienced panic disorder, Baker found a pattern of emotion control and a poor understanding that emotional 'ups and downs' were a normal part of life. These observations led to a research study in the late 1980s which investigated whether any particular emotional processing style characterised people who experienced panic attacks. The findings confirmed that control of emotional experiences and difficulty in labelling emotions were significantly higher in panic patients than the healthy control sample (Baker *et al.*, 2004). These findings prompted Roger Baker to consider that dimensions of emotional control i.e. emotional avoidance and suppression and problems in distinguishing emotions observed in the panic disorder group could be implicated in other anxiety disorders.

Rachman's (1980) concept of emotional processing had already sought to explain why emotional distress is experienced at the time of an event and why it is maintained. In his theory of emotional processing, Rachman (1980) asserted that the active engagement with emotions and the expression of emotions are necessary in order to cope successfully with life events. Conversely, emotional behaviours such as avoiding or suppressing emotions will inhibit emotional processing, the process whereby psychological disruptions associated with an event are resolved.

Building on Rachman's definition of emotional processing as a process whereby emotional disturbances are absorbed and decline to the extent that other experiences and behaviours can proceed without disruption, Baker (2001) put forward how different psychological mechanisms fit together to achieve this absorption. He considered that emotional processing is a process of change from unresolved emotional disturbance to resolution. He therefore proposed a process model to represent the mechanisms which inhibit the emotional processing of the stimulus or emotional trigger event and thus maintain the experience of emotional distress.

The EPM comprises of three stages (see Figure 2.1). The first stage, the Input stage, consists of the event, situation or stimulus that requires emotional processing. If the situation is perceived as a negative experience, the person attempts to avoid exposure to it and the emotion it has evoked. The model

identifies that the person's pre-existing maladaptive pattern of responding to situations or negative schema, will influence how they appraise the event which then shapes the emotion surrounding it. In the second stage, the Emotional Experience stage, emotional experiences are restricted by poor emotional awareness which influences their ability to identify and fully experience the emotion associated with the event or stimulus. In the Output stage, control of the expression of emotions, which is necessary for emotional processing, is influenced by the person's 'emotional rules' concerning whether emotions should be expressed.

EPM Processes	**Stage 1 Input**	**Stage 2 Emotional Experience**	**Stage 3 Output**
Control of Emotions			
	• Initial emotional event • Emotion schemas • Memory of the event • Cognitive appraisal of the event	• Experience of emotions • Understanding of emotions • Control of emotional experience	• Signs of unprocessed emotional material • Reactions to unprocessed emotional material
EPS-25 Factors	• Avoidance	• Emotional experience • Suppression	• Signs of unprocessed emotion • Controllability of emotion

Figure 2.1 Components of the EPM and the EPS-25 factors

2.3.2 The Emotional Processing Scale

The development of the EPM also highlighted the need for a good psychometric scale that was able to assess the different dimensions of emotional processing. The Emotional Processing Scale (Baker *et al.*, 2007) resulted from the pooling of knowledge from an extensive array of sources which included clinical and personal experiences, research interviews and the theoretical and therapeutic

literature identified in the development of the EPM. The implication of these various influences is that the EPS could have a wide range of clinical and research applications.

The final version of the scale, the EPS-25 (Baker *et al.*, 2010), is a five factor self-report measure which assesses the mechanisms and processes involved in emotional processing and whether there are signs of unprocessed material (Rachman, 1980). In terms of the three stages of the EPM, there is one factor measuring 'Avoidance' at the Input stage; there are two factors measuring 'Emotional Experience' and 'Suppression' at the Emotional Experience stage, and two factors measuring 'Signs of Unprocessed Emotion' and 'Controllability of emotion' at the Output stage. (See figure 2.1 for mapping of EPS-25 factors to the stages of the EPM). Avoidance of thoughts, memories and triggers of an emotional event inhibit the encoding of the input, restricting emotional processing at an early stage. The two factors at the Emotional Experience stage relate to mechanisms which constrict emotional processing, reduced emotionality and emotional awareness, and control of emotional states and their expression. At the Output stage 'Signs of Unprocessed emotion' consists of intrusive persistent emotional experiences which indicate that emotional material had not been processed. 'Controllability' reflects high arousal and emotional over-reactivity (Baker *et al.*, 2015a). The psychometric properties and a full description of the current version, the EPS-25, used in the study, are reported in chapter 4.

Use of the EPS-25 can support a number of aims. First, the identification and quantification of different types of emotional processing styles in normal healthy individuals and those with psychological or physical disorders. Second, to provide a conceptual framework to categorise patients for therapy or research. Third, to predict treatment response. Fourth, to assess the contribution of poor emotional processing to the development of physical, psychosomatic and psychological disorders. Fifth, to measure changes in emotional processing as a result of therapy or interventions for physical or psychological disorders. Sixth, to provide a questionnaire-based tool for experimental paradigms exploring emotion, and seventh, to assist therapists to incorporate an emotional component into formulations of therapy (Baker *et al.*, 2007). More recently, Baker *et al.* (2015a) further indicated that the EPS-25 identifies predictive factors for the development of emotional disturbance associated with the onset of a situation or health condition.

The EPS-25 has been used pre- and post- therapeutic interventions for those people with general psychological difficulties (Baker *et al.*, 2012). In the context of physiological disorders, the EPS-25 has been used in studies which have investigated emotional processing in healthy and chronic pain communities (Esteves *et al.*, 2013; Horsham and Chung, 2013; Mathias, 2013). The normative data obtained from these populations and from further national and international studies has been recently published in order to provide comparative data for future research (Baker *et al.*, 2015b).

2.4 Theoretical constructs relating to Emotional Processing

The literature which has explored the psychological constructs presented in the EPM and assessed by the EPS-25 will now be reviewed to consider the applicability of emotional processing as an explanatory concept for the generation and maintenance of emotional distress. The literature is presented using the structure of the sequential framework of the EPM, beginning with the Input stage, followed by the Emotional Experience stage and ending at the Output stage.

2.4.1 The Input stage

This stage of the EPM refers to the initial event or stimulus, the memory of the event and schemas which together influence the cognitive appraisal of the event. The event in the model refers to both external and internal events which may include sensory experiences that require emotional processing. The model considers that appraisal of the event or stimulus will shape the emotion that the person experiences. The tendency to avoid stimuli that trigger a negative emotional response and a generalised avoidant attitude towards exposure to unpleasant feelings are assessed by the 'Avoidance' factor of the EPS-25.

2.4.1.1 Cognitive appraisal

The role of event appraisal in the development of emotional distress has been acknowledged by a range of psychological perspectives. For example, cognitive appraisal theory, introduced by Arnold (1960) and further developed by Lazarus (1966), considers the way in which events or stimuli are perceived or appraised (i.e. how good or bad an event is for the person), and how emotions are responses to such evaluations. People may appraise the same situation differently

and therefore experience different emotional responses to their appraisals which explains why some people are distressed by a stimulus event while others remain undisturbed. If a benign emotional response is generated following appraisal of a situation no actions will be taken to avoid the situation or stimulus (Lazarus, 1991). If, however, a situation is perceived as threatening to wellbeing, then negative emotions, such as fear and anxiety, are generated which in turn influence behaviours that attempt to avoid the situation (Oatley and Johnson-Laird, 1987). Foa and Kozak (1986) asserted that the burden of emotional distress following negative appraisal of a situation will remain if such threatening emotions are not processed.

2.4.1.2 Memory and schemas

Research literature relating to the role of memory and schemas in persistent psychological distress further supports the input stage of the EPM. For example, according to Greenberg and Pascual-Leone (2006), the memory surrounding the onset of an event or stimulus may exert an ongoing influence on its emotional significance. The authors further suggested that persistent internal recall magnifies an event's emotional content and, if this is not diffused by the expression of emotional distress, it will remain unprocessed. Similarly, persistent patterns of thoughts and beliefs about oneself or others, emotions and behaviours, known as schemas, have been further identified as influential on how events or stimuli are appraised (Scherer, 2004; Frijda, 2007; Moors *et al.*, 2013). Maladaptive schemas may determine that external or internal events are habitually appraised in a negative way, and thus negative emotional experiences are elicited.

2.4.1.3 Experiential avoidance

The components of this stage of the EPM are further identified in the highly influential process model of emotional regulation put forward by Gross and Thompson (Gross and Thompson, 2007). In this model, the use of deliberate behaviours which attempt to draw attention away from a situation that has generated a spontaneous negative emotional state are presented. Building on this perspective, Sheppes *et al*. (2014) proposed that the emotional intensity of a situation tends to increase over time if distraction is used early to control negative emotions. This assertion supports the conceptualisation of avoidance in the EPM as a 'pre-attempt' to manage emotions before they are fully experienced.

The avoidance of aversive internal emotional events as conceptualised in the EPM is also consistent with the construct of experiential avoidance (Hayes *et al.*, 1996; Hayes *et al.*, 2004), which is strongly evidenced in the development and maintenance of psychological distress (Chawla and Ostafin, 2007). Experiential avoidance is viewed as comprising two related components, avoidance and escape. The avoidance component is defined as the unwillingness to experience aversive internal events such as thoughts, feelings, memories, and bodily sensations. The escape component is described as the actions taken to alter the experience of such events or to minimise the occurrence of the contexts in which the events occur. Experiential avoidance is considered to be maintained through negative reinforcement. According to Hayes *et al.* (1996), short term relief of distress is achieved through escape actions which increase the potential that such behaviours will persist and may lead to psychological disturbances associated with distress avoidance. Experiential avoidance of aversive internal events and behavioural attempts which seek to minimise such events are therefore together considered as actions which generate and maintain emotional distress.

2.4.2 The relationship between the Input stage components and health disorders

In addition to the general literature around the core concepts of stage 1 of the EPM and their relevance to emotional processing, the concepts of appraisal and avoidance have been specifically implicated in relation to coping with a number of health related disorders. Health research has suggested that the person's predisposition to adopt patterns of behaviour in response to life events or schemas, may determine their adaptation to health conditions (Keefe *et al.*, 2001; Ramírez-Maestre and Esteve, 2013; Brooks *et al.*, 2017).

2.4.2.1 Schemas and cognitive appraisal

Building on illness cognitions and coping research (Leventhal *et al.*, 1980; Leventhal *et al.*, 1997; Cameron and Leventhal, 2003), the Common-Sense Model of Health and Illness Behaviour (Leventhal *et al.*, 2012) is based on problem-solving and suggests that physiological symptoms are dealt with by individuals in the same way as other life events. Thus, schemas, broad pervasive patterns of thoughts, beliefs and emotions such as an habitual tendency to negatively appraise situations, will shape how the person makes sense of their symptoms and guide future coping behaviours. In support of this assertion, Gheldof *et al.*

(2006) further identified that, in relation to chronic pain, a person's vulnerability to negatively appraise situations may influence how the experience of pain is appraised.

Other research has also acknowledged the detrimental role of negative schemas on coping. For example, the habitual tendency to catastrophize, magnify or exaggerate the threat value of an event has been further identified as a determinant for catastrophic thinking about pain and postulated as a predictor for symptom related distress (Sullivan *et al.*, 2001; Quartana *et al.*, 2009). Individuals with an increased vulnerability to catastrophizing and pain-related fear are less changeable in their fear beliefs than those without these vulnerabilities and, therefore, their negative cognitive and emotional responses to pain are maintained. In support of the applicability of the EPM as an explanatory framework for symptom related distress, Horsham and Chung (2013) established, by using the EPS-25, that emotional processing difficulties were associated with pain catastrophizing and impaired psychological wellbeing indicating that maladaptive emotional processing styles prevent the resolution of distress and cognitive reappraisal.

A further factor that may contribute to physiological symptom related distress is that of anxiety sensitivity (AS). This construct identifies that some individuals have a cognitive vulnerability to fearful responses concerning bodily sensations due to the belief that these sensations are harmful (Reiss and McNally, 1985). Fear of the emotional and physiological consequences of such sensations, a form of anxious arousal, is associated with generalised health anxiety and symptom related distress in chronic pain patients (Asmundson and Taylor, 1996; Zvolensky *et al.*, 2001).

2.4.2.2 Avoidance

Avoidance actions in response to perceived challenges to health have been widely considered as detrimental to the process of adaptation (Austenfeld and Stanton, 2004; van Middendorp *et al.*, 2008). Building on the cognitive-behavioural approach to treating chronic pain (Fordyce *et al.*, 1982), Philips (1987) argued that avoidance is associated with the expectancy that further exposure to pain will promote pain perception and suffering, thereby acknowledging the influence of negative cognitions and avoidance behaviour on symptom distress.

A more recent perspective on avoidance, the construct of experiential avoidance (Hayes *et al.*, 1996) identifies that attempts to control or limit contact with

emotional, physical, and cognitive experiences evaluated as detrimental prevent the resolution of distress. Similarly, McCracken (1998) found that attempts to control the experience of pain were associated with symptom distress and conversely, the willingness to experience continuing pain without needing to reduce, avoid or otherwise change it, indicated more successful adjustment to chronic pain. Further, Viane *et al.* (2003) established the unique contribution of acceptance in predicting wellbeing beyond pain severity which indicates, inversely, that somatic symptom intensity is not an important explanatory variable for experiential avoidance.

In the context of the relationship between anxiety sensitivity and pain related distress, avoidance actions are conceptualised as attempts to avoid anxious responses to physiological and emotional experiences which ultimately prevent the resolution of distress (Asmundson and Taylor, 1996). Further, McCracken and Keogh (2009) argued that anxiety sensitivity may be considered as part of a more general tendency to respond in a stressful and avoidant way towards one's own experience of emotions which restricts psychological adaptation to and acceptance of pain.

Overall, the literature has indicated that a predisposition to negative appraisal and fearful emotional responses, together with the vulnerability to avoid these cognitive and emotional experiences, are strongly associated with the generation and maintenance of symptom related distress.

2.4.3 The Emotional Experience Stage

This stage of the EPM concerns the experience of emotions, understanding of emotions and control of the experience. A detached experience of emotions and poor emotional insight are assessed by the 'Emotional Experience' factor of the EPS-25 and control of emotional states and their expression is measured by the 'Suppression factor'. The ability to recognise and fully experience emotions is considered important from an evolutionary perspective as it promotes adaptive responses to environmental changes or events (Cosmides and Tooby, 2000). Further, these emotional competencies are viewed as an intrinsic part of the processing of emotional events (Gendlin, 2003; Greenberg, 2004).

2.4.3.1 Emotional experience

In healthy development, individuals are aware of and can differentiate between emotions and the physiological components that comprise them. Furthermore,

they are able to identify and describe their emotions which helps to understand them and link them to events. In contrast, emotional processing is inhibited by the failure to experience an emotion as a psychological whole (Rogers, 1961; Gendlin, 1996), and by the inability to link emotional feelings with the situation that triggered them (Rogers, 1961; Conway and Bekerian, 1987). Difficulties in identifying and labelling emotions or distinguishing them from bodily sensations, dimensions of the hypothetical construct of alexithymia (Taylor, 1984; Taylor and Bagby, 1988), further inhibit emotional processing.

A further related concept, that of emotional intelligence, was introduced by Salovey and Mayer (1990) as a type of social intelligence which reflects the adaptive abilities of appraisal and expression of emotion, appraisal of emotions in others, regulation of emotion and utilisation of emotions in solving problems. Thus, emotional intelligence suggests that the person's competency in identifying emotions is important for solving emotional problems and assists them to cope successfully with challenging life events. Evidence has suggested that emotional intelligence is associated with more adaptive responses to stress and psychological wellbeing (Schutte *et al.*, 2007).

2.4.3.2 Emotional suppression

Many theoretical perspectives assume, in accordance with the EPM, that the drive to express oneself emotionally is a natural physiological response and an important component of emotional processing (Greenberg and Safran, 1987; Pennebaker, 1995; Gross and John, 1998; Kennedy-Moore and Watson, 1999). The process model of emotional regulation (Gross and Thompson, 2007), introduced in section 2.4.1.3, considers emotional control as a form of emotion-focused response strategy: suppression of powerful distressing emotions generated from situational appraisal decreases emotion-expressive behaviour thus inhibiting emotional processing.

The detrimental effects of emotional suppression on psychological wellbeing is further identified within the construct of experiential avoidance (Hayes *et al.*, 1996) (see section 2.4.2.2). In a therapeutic context, attempts to control, suppress or block emotional experiences are seen as barriers to emotional processing (Gendlin, 2003; Whelton, 2004; Greenberg, 2006). The control of emotional states and their expression may be shaped by beliefs concerning the value and function of the experience of emotions and their expression and judgments on the acceptability of negative emotions (Campbell-Sills *et al.*, 2006).

Further, according to Foa and Kozak (1986), beliefs concerning the consequences of the loss of emotional control also determine emotional suppression. The tendency to control emotions has also been identified as the product of the emotional climate of the persons' family and its emotional expressivity whereby early schemas are generated which impact on future emotional behaviours (Morris *et al.*, 2007). These perspectives are consistent with Baker *et al.*'s (2015a) assertion that the extent to which an individual is willing or able to express their emotions is governed by "emotional rules" or beliefs which determine emotional control.

2.4.4 The relationship between the Emotional Experience stage variables and health disorders

Further to the general literature relating to the concepts of the second stage and emotional processing, the ability to understand, fully experience and express emotions has specifically been implicated in adapting to health related disorders. Health research suggests that the person's predisposition to poor emotional awareness, impoverished emotional experiences and control of emotional states and their expression, influences their ability to cope with physiological conditions. This evidence will now briefly be considered.

2.4.4.1 Emotional experience

In their review of research on pain and emotion, Lumley *et al.* (2011) specified that the emotional processes of accessing and experiencing emotions and differentiating and labelling emotions influence emotional states related to the experience of and adjustment to pain. Consistent with this, the hypothetical personality construct of alexithymia (Taylor, 1984; Taylor and Bagby, 1988), (see section 2.4.3.1) which identifies the predisposition to difficulties in identifying and communicating feelings, has been associated with a range of sensory disorders (Lumley *et al.*, 2005; Kojima *et al.*, 2014; Margalit *et al.*, 2014). More recently, Di Tella *et al.* (2017) suggested that alexithymia was an important explanatory variable for persistent pain related distress which limits the ability to process emotions.

White *et al.* (2011) further postulated that alexithymia may be a contributory factor to the predisposition to anxiety sensitivity (AS), presented in section 2.4.2.1, where vigilance to bodily sensations is associated with persistent health related distress (Asmundson *et al.*, 2000; Ocañez *et al.*, 2010). White *et al.*'s

(2011) assertion suggests that poor emotional awareness could determine the constructs' shared characteristic of the vulnerability to focus on somatic symptoms and the disconnect between physiological experiences and emotional responses which inhibits emotional processing. However, it would appear the literature has not, as yet, further considered the role of restricted emotional awareness within the construct of anxiety sensitivity. This observation and the literature presented above indicate that research is needed where the relationship between emotional processing and the ability to recognise emotions generated by somatic sensations are identified within the context of a conceptually cohesive framework. Their contributions to emotional distress associated with sensory disorders may then be assessed by a measure which captures these constructs.

A further construct where emotional awareness is implicated as an important variable for emotional processing is that of emotional intelligence (Salovey and Mayer, 1990; Mayer and Salovey, 1997), (see section 2.4.3.1). The competency in identifying emotions is considered important for solving emotional problems and therefore it could assist in coping successfully with challenging life events. However, from a meta-analytic investigation of the relationship between emotional intelligence and mental, physical and psychosomatic health (Schutte *et al.*, 2007) it was concluded that there were not sufficient studies to allow meta-analytic examination of the moderating role of emotional intelligence in physical health conditions. The authors suggested that future research examining these relationships, using a broader array of emotional intelligence conceptualisations, is needed to address this absence of evidence.

2.4.4.2 Emotional suppression

The detrimental effects on health and wellbeing of behaviours which attempt to suppress emotional experiences has been acknowledged (Hayes *et al.*, 2011); (Gross and John, 2003). The suppression of emotional states and their expression have been considered as predictive factors for poor emotional processing in individuals with chronic physiological disorders (Austenfeld and Stanton, 2004), for the maintenance of emotional distress associated with long term health conditions (de Ridder *et al.*, 2008), for poor physical health outcomes such as coronary artery disease (Denollet *et al.*, 2010) and for chronic pain (Geenen *et al.*, 2012). In contrast, emotional expression facilitates emotional processing, thus the resolution of fears relating to health concerns, and is associated with better psychological functioning (Pennebaker, 1997), reduced stress arousal (Brosschot and Thayer, 2004) and acceptance of physical symptoms (Greenberg, 2004).

Further, the personality trait of social inhibition (SI) identifies the stable tendency to inhibit the expression of emotions and behaviours in social interactions (Asendorpf, 1989). It is part of the broader construct the type D personality (D meaning distressed) which is associated with a high vulnerability to chronic health related distress (Denollet, 2005).

2.4.5 The Output Stage

The first two stages of the EPM identify emotional processing styles and emotional schemas which restrict emotional experiences and inhibit the expression and processing of emotions. The Output stage of the EPM reflects Rachman's (1980) conceptualisation of emotional processing as a process whereby emotional disturbances are absorbed and decrease to the extent that other experiences and behaviour can proceed undisrupted. Rachman (2001) further suggested that the presence of unprocessed emotional material that still needs working through is evidenced by persistent symptoms of emotional distress which reflect the final stage of the EPM.

The Output stage identifies indicators of unprocessed emotions as the experience of persistent intrusive overwhelming emotions which are assessed by the 'Signs of Unprocessed Emotion' factor of the EPS-25. Unprocessed emotional material is also reflected by the presence of powerful externally orientated uncontrolled emotions involving high arousal, agitation or anger, which is assessed by the 'Controllability' factor. Existing literature has implicated the emotional processing styles conceptualised in the EPS-25 as explanatory variables for indicators of poor emotional processing identified by the Signs of unprocessed emotion and Controllability factors.

Blackledge and Hayes (2001) postulated that experiential avoidance (Hayes *et al.*, 1996), serves to increase the frequency or intensity of the avoided feelings. Arousal is also associated with avoidance actions in response to the burden of intense emotional states (Keltner *et al.*, 2013) and, according to Foa and Kozak, (1986) it is an observable indicator of incomplete emotional processing. Further, Mitmansgruber *et al.* (2009) proposed that unregulated behavioural expressions of anger, agitation or irritability reflect the psychological burden of experiential avoidance.

The predisposition to suppress emotions has been implicated in the experience of heightened levels of persistent negative emotions (Gross and John, 2003).

Campbell-Sills *et al*. (2006) further identified that schemas, where these emotions are deemed unacceptable, may increase suppression efforts whereby they remain internalised. A number of researchers have hypothesised that arousal, a component of physiological reactivity, is evidence of suppression of emotional states and their expression (Gross and Levenson, 1993, 1997; Moore *et al*., 2008). In their review of the literature on the relationship between emotional regulation and aggression, Roberton *et al*. (2012) further identified that the dispositional tendency to emotional suppression is associated with elevated anger states which lowers the person's inhibitions regarding verbal and behavioural expressions of anger.

Impoverished understanding of emotional experiences and poor emotional expression identified in the construct of alexithymia (Taylor and Bagby, 1988) have been proposed as predictors for persistent aversive emotional experiences (Lumley *et al*., 2011), and heightened physiological arousal (Taylor and Bagby, 2004). Lumley *et al*. (2007) asserted that the perception of emotions as uncontrollable and unpredictable may be attributed to difficulties in the awareness and differentiation of emotional states. Poor emotional awareness was further identified as a contributory factor to maladaptive expressive responses to emotion distress by Moore *et al*. (2008), where the impoverished ability to access information contained in emotions may make it difficult to respond helpfully to emotional states. Similarly, Roberton *et al*. (2012) considered alexithymia a predictor for the tendency to unregulated impulsive verbal and behavioural expressions of anger.

In support of the literature presented, the resolution of persistent symptoms of emotional distress such as increased arousal, irritability or outbursts of anger is facilitated by emotional processing focused therapy (Murray and Segal, 1994; Pennebaker, 1997; Baker *et al*., 2013). This treatment approach addresses the person's unhealthy predisposition to experiential avoidance, poor emotional awareness and suppression of emotional states and their expression (Greenberg, 2004).

2.4.6 The relationship between the Output stage components and health disorders

In addition to the general literature, health research has implicated the emotional processing styles conceptualised in the EPS-25 as explanatory variables for indicators of poor emotional processing identified by the Signs of unprocessed

emotion and Controllability factors. For example, in their exploration of emotional processing styles in individuals with fibromyalgia, Van Middendorp *et al*. (2008) hypothesised that an emotional approach coping style, characterised by emotional processing and expression, in contrast to an avoiding coping style, typified by the predisposition to alexithymia and emotional suppression, would protect against emotional distress. The authors established that the experience of intense negative emotions was associated with persistent emotional distress in those fibromyalgia patients with maladaptive emotional processing styles. Given their findings, Van Middendorp *et al*. (2008) proposed that when individuals lack emotional awareness, or suppress or avoid their emotions, repeated emotional intrusions elicit elevated physiological arousal reinforcing attention to somatic experiences which, together, maintain the experience of symptom related distress. In support of this evidence, Geenen *et al*. (2012) concluded from their examination of emotional processing styles in fibromyalgia that inhibiting the expression of intense emotions represents a significant risk factor for persistent psychological distress and maladaptive coping.

While these studies and further literature have acknowledged that emotional expression may be beneficial to physical and psychological adjustment to chronic health conditions (de Ridder *et al*., 2008), persistent emotional over-reactivity, characterised by unregulated verbal and behavioural expression of anger identified in individuals with chronic pain, has been associated with unhealthy emotional processing styles. For example, higher anger expression has been linked with maladaptive coping responses such as experiential avoidance which inhibits the resolution of symptom distress. According to Trost *et al*. (2012), continued efforts to extinguish pain perception may culminate in aggression thus generating persistent arousal and reinforcing emotional distress. Further, in their review of the role of alexithymia in chronic pain disorders, di Tella *et al*. (2016) concluded that poor emotional awareness and difficulty in expressing emotions, components of alexithymia, were associated with persistent maladaptive externally orientated expressions of distress.

The evidence presented in this section is supported by the findings from Esteves *et al*.'s (2013) study where emotional processing in patients with chronic lower back pain was assessed by the EPS-25. Significantly greater scores relating to the Emotional experience, Suppression, Signs of unprocessed emotion and Controllability of emotion factors were found in the patient group as compared with the non-clinical sample. Their findings indicated that the poor emotional

processing styles identified in the patient group may determine the generation and maintenance of maladaptive physiological and emotional responses to somatic information. This corroborates the potential applicability of the EPM as a cohesive explanatory framework for the relationship between the constructs relating to emotional processing identified in the literature and maladaptive responses to sensory disorders. However, given that the study did not use a self-report measure of symptom distress further investigations are warranted that examine the relationship between emotional distress associated with sensory disorders, as assessed by self-report measures, and emotional processing styles.

2.5 Summary

This chapter has presented the context of the study. While the literature has identified physical arousal, irritability and persistent distressing intrusive feelings as symptoms of tinnitus distress, it has not considered, to date, that such symptomology are indicators of unprocessed emotion, as presented by Rachman (2001) (see section 1.3). Prevalence studies have established that for a significant number of people who experience tinnitus their lives are seriously disrupted. The overview of current explanatory models evidenced that there is no agreement on the mechanisms involved in the generation and maintenance of tinnitus distress and, currently, an emotion-based theory has not been introduced. The limitations of the diverse models and theories presented and their respective current clinical applications indicated that a treatment protocol based on a further theoretical perspective that reflects a more cohesive framework for tinnitus distress is needed.

The concept of emotional processing (Rachman, 1980) was introduced to explain why emotional distress might be experienced at the time of an event and how it may can be maintained. Rachman proposed that active engagement with emotions and the expression of emotions are necessary in order that psychological disruptions associated with an event or stimulus are resolved and, conversely, emotional behaviours such as avoiding or suppressing emotions inhibit emotional processing of such experiences. Informed by Rachman's (1980) work and a wide range of theoretical and therapeutic literature, the EPM ((Baker, 2001) identifies how different psychological mechanisms fit together to achieve emotional processing.

The general literature has identified concepts relating to emotional processing which are implicated in the generation and maintenance of emotional distress. These include experiential avoidance, emotional schemas, poor emotional awareness, suppression of emotional states and their expression. The predisposition to behaviours which exert control over the experience of emotions, thus inhibiting emotional processing, was also acknowledged as an explanatory variable for persistent psychological distress. Consistent with Rachman's (2001) indicators of unprocessed emotion, persistent negative emotional experiences, heightened physiological arousal and emotional over-reactivity have been recognised as consequences of unhealthy emotional processing styles as conceptualised in the EPS-25 factors. While the literature has identified a range of constructs that are implicated in emotional processing, the psychological mechanisms involved from event or stimulus onset and the subsequent components of emotional processing have not been presented in a single cohesive conceptual framework.

The literature has further suggested that components of emotional processing presented in the EPM play important roles in adapting to health challenges and, in particular, chronic pain. The evidence has also indicated that unhealthy emotional processing styles are implicated in the persistence of emotional distress associated with such conditions. In accordance with the general literature, persistent symptoms of pain related distress were identified as the consequence of emotional processing deficits. The focus on how the processing of emotions relates to the experience of symptom related distress in health disorders has thus been identified as an important area of research. As discussed earlier, the EPM has not hitherto been applied to the investigation of tinnitus distress. This study therefore sought to progress the understanding of tinnitus distress by exploring the role of emotional processing in people who experience tinnitus related distress.

The following chapter examines evidence from the literature relating specifically to tinnitus distress which has investigated the constructs presented in the EPM and, from this review, gaps in knowledge are identified from which the aim of the study and the research question have been developed.

Chapter 3: The review of the literature

The review examines evidence from the literature relating specifically to tinnitus distress which has investigated the constructs presented in the EPM and, from this, identifies gaps in knowledge. The concluding summary of the findings establishes the importance of the research question and the applicability of the EPM as an explanatory framework for this research. The review of the literature was initiated prior to the commencement of the study in 2009, updated throughout the course of the study in order to capture emerging evidence, and then finalised in December 2016.

3.1 Search methods

The search strategy adopted for the study was informed by a range of resources which identified the main systematic approaches to searching the literature (Jones, 2007; Jesson *et al.*, 2011; Aveyard, 2014). Key constructs which represent the psychological mechanisms involved in emotional processing and the components of the EPM were identified from which the following search terms were developed: emotional control, cognitive appraisal, schemas, emotional response, avoidance, emotional experience, emotional awareness, emotional suppression, emotional expression, emotional disruption, emotional disturbance, arousal, anger, irritability and agitation. The Boolean operator AND was combined with the search terms identified and 'tinnitus'. Truncation and wildcarding techniques were used to ensure that all relevant permutations of a word were picked up – for example, emotion*. The literature was obtained from a variety of databases: CINAHL, DelphiS, EMBASE, MEDLINE, PsycINFO, Scopus and Web of Science. Full details of the databases used are presented in Appendix 1. Date limits were not imposed in the search process in order to capture seminal works and the historical development of the constructs. Regular update searches were performed in order to capture new publications and grey literature such as theses, unpublished conference proceedings and dissertation abstracts. New articles were also identified by database citation alerts and hand-searching of bibliographies from papers and books retrieved from database searches and professional journals.

3.2 Inclusion and exclusion criteria

To ensure that only those papers that are relevant to the formulation of the research question are included in the literature review it is necessary to determine the criteria for inclusion and exclusion (Randolph, 2009). The focus of the study concerns the applicability of the EPM to tinnitus research and specifically, how the model may contribute to the understanding of tinnitus distress in the adult population. Therefore, investigations which involved children were excluded. Evidence from papers published in languages other than English was not accessible and they were also excluded.

3.3 Literature retrieved

The flow diagram below presents the PRISMA search strategy technique used. It starts with the identification of articles found in each database based on the search terms. Second, the screening process identified article duplicates which were then removed. Third, the remaining articles' titles and abstracts were examined to establish whether they fulfilled the inclusion criteria. Those that did not meet the inclusion criteria were removed. Full texts of the remaining articles were then examined for eligibility. Unpublished papers presented in conference abstracts were then excluded. This resulted in the twelve papers which were identified as the most relevant.

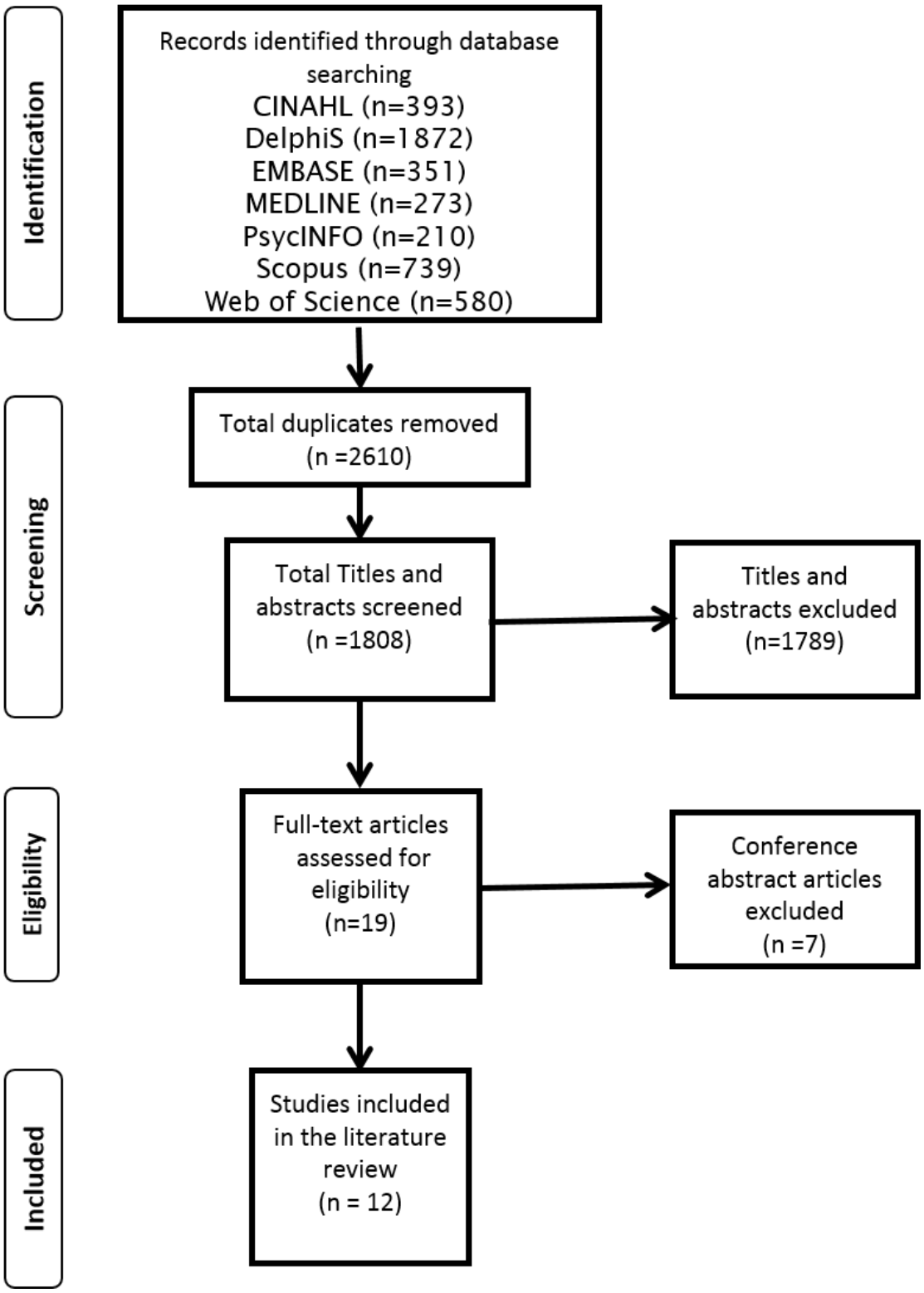

Figure 3.1 PRISMA flow diagram

3.4 Process of critical appraisal

Critical appraisal is the process of carefully and systematically examining research to judge its trustworthiness, value and relevance in a particular context (Burls, 2009). This allows for the evaluation of the current state of knowledge so that gaps pertaining to such knowledge can be identified (Cronin *et al.*, 2008), supporting the rationale for conducting future research.

Prior to final inclusion, the twelve papers were reviewed using the Critical Appraisal Skills Programme (CASP) frameworks for quantitative and qualitative studies. The CASP frameworks were chosen because of their effectiveness for analysing the strengths and weaknesses of the studies. Each framework provided a structure to critically appraise the dimensions of the studies which include the aims, sample, methods, results and research limitations. An example of the outcome of the critical appraisal process is presented in Appendix 2. The pertinent data relating to the studies included in the review are summarised in Table 3.1 shown below. The table identifies the constructs under investigation which relate to emotional processing and the components of the Emotional Processing Model.

Table 3.1 Summary of studies

Authors and date	Key variables investigated	Study aims	Design, sample, data collection and analysis methods	Key findings
(1) Andersson & Edvinsson 2008	Cognitive appraisal Control of emotional expression	To obtain tinnitus patients' views of living with tinnitus and their experiences of treatment.	**Design:** Modified grounded theory approach. **Sample:** 7 tinnitus patients. **Data collection:** Semi-structured interviews. **Analysis methods:** Grounded theory analysis to generate descriptive categories.	The consequences of living with tinnitus were persistent negative thoughts and feelings and worry about future living with tinnitus. Public identity behaviour reflected their perception that other people did not understand their suffering and therefore they did not express their distress to others.
(2) Andersson & Vretblad 2000	Cognitive appraisal	To investigate the role of anxiety sensitivity in tinnitus distress.	**Design:** Cross-sectional. **Sample:** 146 tinnitus patients. 33 patients reported no dizziness and 88 patients reported intermittent or constant dizziness. **Data collection:** Tinnitus Reaction Questionnaire (TRQ) and Anxiety Sensitivity Index (ASI). **Analysis methods:** Correlation and multiple regression.	The ASI correlated significantly with tinnitus distress. The association between the ASI and the TRQ was not significant in non-dizzy patients. The study design was unable to identify if AS precedes or follows tinnitus distress.
(3) Bartels, Pedersen, van der Laan, Staal, Albers, & Middel 2010	Control of emotional expression	To evaluate the impact of Type D personality on health related quality of life and tinnitus distress.	**Design: C**ross-sectional **Sample:** 265 tinnitus patients **Data collection:** Hospital Anxiety and Depression Scale, the Maastricht Questionnaire, the Type D Personality Scale (DS14), the Short-Form Health Survey 36, and the Tinnitus Reaction Questionnaire. **Analysis methods:** Fisher's exact test and structural equation modelling.	Type D personality was a direct predictor of mental and physical quality of life and tinnitus-related distress.
(4) Budd & Pugh 1996	Cognitive appraisal Avoidance	To assess whether tinnitus patients adopt	**Design:** Cross-sectional **Sample:** 116 tinnitus patients.	Maladaptive coping, characterised by attempts to avoid tinnitus and catastrophic

Authors and date	Key variables investigated	Study aims	Design, sample, data collection and analysis methods	Key findings
		consistent coping styles and to explore the relationship between coping style, tinnitus severity and tinnitus distress.	**Data collection:** Beck Depression Inventory (BDI), State-Trait Anxiety Inventory (STAI), Likert-type scale of tinnitus loudness, annoyance and interference (non-validated) and the Tinnitus Coping Style Questionnaire (TCSQ). **Analysis methods:** Factor analysis, correlation and linear regression analysis.	thinking about the consequences of tinnitus, were associated with higher levels of tinnitus severity, depression and anxiety. Effective coping, reflected by activity engagement, was not associated with less tinnitus severity and less emotional distress. Passive coping which involved attempts to mask tinnitus with other sounds was correlated with increased tinnitus severity and emotional distress.
(5) Cima, Crombez & Vlaeyen 2011	Cognitive appraisal Avoidance	To investigate whether catastrophic misinterpretations of tinnitus and tinnitus specific fear were explanatory factors for tinnitus distress and poorer quality of life.	**Design:** Cross-sectional **Sample:** 61 tinnitus patients. **Data collection:** The Tinnitus Questionnaire (TQ), the Hospital Anxiety and Depression Scale (HADS), the Quality of life measure RAND (SF-36), the Tinnitus Catastrophizing Scale (TCS), the Fear of Tinnitus Questionnaire (FTQ) and the Tinnitus Vigilance and Awareness Questionnaire (TVAQ). **Analysis methods:** Correlation and regression analyses.	The level of catastrophizing was highly associated with both tinnitus-specific fear and increases attention toward tinnitus. Higher levels of tinnitus-related fear were not associated with increased tinnitus attention after controlling for catastrophizing first. Catastrophizing misinterpretations were significantly related to poorer quality of life.
(6) Croft, Brown, Thorsteinsson & Noble 2013(a)	Acceptance	To develop a self-report measure based on the acceptance psychotherapy model to identify tinnitus responses patterns which indicate tinnitus distress.	**Design:** Cross-sectional **Sample:** 273 participants completed the measures online, 278 participants completed a hard copy. **Data collection:** Prototype Tinnitus Response Scales (TRS) and a self-report measure of tinnitus history, severity, distress and interference. Shorter 24-item version of TRS, Tinnitus Coping Style (TCSQ), TRQ, Brief Assessment of Tinnitus Severity (BATS), Depression and Anxiety and Stress Scale-21	Factor analysis indicated a three factor solution 'Defeat', 'Control' and 'Acceptance'. The acceptance and defeat sub-scores were inversely correlated. The defeat sub-scale was highly correlated with tinnitus distress.

Authors and date	Key variables investigated	Study aims	Design, sample, data collection and analysis methods	Key findings
			(DASS), Illness Perception Questionnaire-revised (IPQ-R). **Analysis methods:** Exploratory Factor Analysis. Confirmatory Factor Analysis, Cronbach's alphas, test-retest reliability, correlations, multiple regression analyses.	
(7) Croft, Brown, Thorsteinsson & Noble 2013(b)	Acceptance	To examine the relationship between tinnitus acceptance and tinnitus habituation.	**Design:** Cross-sectional. **Sample:** 273 participants completed an online survey. **Data collection:** TRS, TRQ and the Tinnitus Habituation Scale (THS). **Analysis methods:** Exploratory Factor Analysis. Principal Component Analysis,	EFA indicated that seven tinnitus acceptance items from the Tinnitus Response Scales and 19 additional tinnitus habituation items all loaded onto a single tinnitus adaptation factor. The tinnitus habituation items captured participant's perceptual and behavioural response to the tinnitus reflecting habituation and tinnitus acceptance tapped cognitive responses to the noise.
(8) Hesser & Andersson 2009	Cognitive appraisal Avoidance	To investigate the role of anxiety sensitivity and behavioural avoidance in tinnitus distress, anxiety and depression.	**Design:** Cross-sectional **Sample:** 283 individuals who experienced tinnitus obtained from a national survey study on hearing loss, dizziness and tinnitus. **Data collection:** 11-item version of the ASI, the HADS, questions to measure tinnitus distress, interference with normal functioning and avoidance of situations which may result in tinnitus awareness or increased tinnitus. **Analysis methods:** Correlation and regression analyses.	AS was a significant predictor of variance of tinnitus distress after controlling for anxiety and depression symptoms. The relationship between AS and tinnitus distress was partially mediated by behavioural avoidance.

Authors and date	Key variables investigated	Study aims	Design, sample, data collection and analysis methods	Key findings
(9) Hesser, Bankestad & Andersson 2015	Acceptance	To examine the contribution of acceptance in accounting for tinnitus severity beyond anxiety and depression symptoms.	**Design**: Cross-sectional. **Sample**: 362 tinnitus patients. **Data collection**: The Tinnitus Acceptance Questionnaire (TAQ), the Tinnitus Handicap Inventory (THI) and the HADS. **Analysis methods**: Correlation and regression analyses.	Greater acceptance was associated with less tinnitus severity and anxiety and depression symptoms.
(10)Kleinstauber, Jasper, Schweda, Hiller, Andersson & Weise 2013	Cognitive appraisal Avoidance	To investigate the role of fear avoidance cognitions and behaviours in patients who experience tinnitus distress.	**Design**: Cross-sectional **Sample**: 373 participants recruited from 435 patients registered for two Internet-based treatment studies. **Data collection**: The German versions of the THI and the HADS, Anxiety Sensitivity Index 3 (ASI-3), Tinnitus Fear-Avoidance Cognitions and Behaviours Scale (T-FAS), the German version of the Big Five Inventory (BFI-10) and single items relating to hearing loss and dizziness. **Analysis methods**: Exploratory Factor Analysis, Principal Component Analysis, correlation analysis, Sobel tests.	PCA indicated a three-factor solution for the T-FAS, 'Fear-Avoidance Cognitions', 'Tinnitus-related Fear Avoidance Behaviour and 'Ear-related Fear-Avoidance Behaviour'. The first factor was associated with tinnitus distress, depressive symptoms and anxiety.
(11) Schutte, Noble, Malouff & Bhullar 2009	Acceptance	To investigate if emotional intelligence was associated tinnitus acceptance and inversely correlated	**Design**: Cross-sectional. **Sample**: 162 individuals with tinnitus recruited via tinnitus support groups, clinics and the media.	Greater acceptance of tinnitus symptoms was associated with less tinnitus distress. Emotional intelligence was not significantly associated with less tinnitus distress.

Authors and date	Key variables investigated	Study aims	Design, sample, data collection and analysis methods	Key findings
		with tinnitus related distress and general emotional distress.	**Data collection:** Tinnitus Severity Scale (TSS), TRQ, General Health Questionnaire-12 (GHQ), Tinnitus Experience Questionnaire (TEQ), Emotional Intelligence Scale (EIS). **Analysis methods:** Structural equation modelling, means and standard deviations, inter-correlations of variables.	
(12) Westin, Hayes & Andersson 2008	Acceptance	1) To investigate the construct of psychological acceptance in a population of tinnitus patients. 2) To investigate the mediating role of acceptance on tinnitus distress at baseline and tinnitus distress, anxiety, life quality and depression at 7 month follow up.	**Design:** 1) Cross sectional 2) Longitudinal **Sample:** 1) 77 tinnitus patients 2) 47 tinnitus patients at baseline, 45 patients at follow up. **Data collection**: 1) Acceptance and Action Questionnaire (AAQ), Chronic Pain Acceptance Questionnaire-Revised (CPAQ-R) 2) Tinnitus Acceptance Questionnaire (TAQ), AAQ, THI, Quality of Life Inventory (QOLI), HADS. **Analysis methods**: 1) Principal components factor analysis, frequency distributions, correlation 2) Linear regression, means and standard deviations, regression analyses at base line and follow up, Sobel tests, correlations.	1) The TAQ had good internal consistency and satisfactory test-retest reliability. Factor analysis indicated a two-factor solution, 'Activity engagement' and 'Suppression'. 2) The acceptance factor activity engagement showed full mediation for depression and life quality at follow up and partial mediation for tinnitus distress. Tinnitus suppression was not related to tinnitus distress and was omitted from further analyses.

3.5 The review of the literature

3.5.1 Introduction

The research evidence which implicates the role of emotional processing constructs in the generation and maintenance of tinnitus distress will now be presented, and gaps in knowledge will be identified from which the aim of the study and the research question have been developed. The literature revealed four key themes. These were cognitive appraisal, avoidance, acceptance and control of emotional expression. Informed by a range of theoretical perspectives, the survey based studies (numbered 2-12 in Table 3.1) reviewed aimed to establish whether the constructs identified by the key themes represented explanatory variables for tinnitus distress. The interview study (Andersson and Edvinsson, 2008) (see study (1) in Table 3.1.) explored the experiences of individuals who were distressed by their tinnitus which reflected behaviours identified by the cognitive appraisal and control of emotional expression themes.

3.5.2 Cognitive appraisal

The relationship between negative cognitive appraisal of tinnitus and tinnitus distress was investigated in one paper (see (2) in Table 3.1) and explored in the interview study (1). Negative appraisal was proposed as the catalyst for maladaptive avoidance behaviour in four studies (4,5,8 and 10 in Table 3.1) which will be reviewed in the next section relating to the avoidance theme.

Andersson and Vretblad (2000) (2) explored the construct of anxiety sensitivity (AS) as a potential explanatory variable for tinnitus distress. Anxiety sensitivity identifies that some individuals have a cognitive vulnerability to fearful responses concerning bodily sensations. It is suggested that the tendency to evaluate somatic symptoms as harmful generates catastrophic misinterpretations of bodily sensations which lead to increased physiological responses that reinforce their distressing interpretations. Andersson and Vretblad (2000) found that anxiety sensitivity measured using the Anxiety Sensitivity Index (ASI) (Reiss *et al.*, 1986) correlated significantly with the Tinnitus Reaction Questionnaire (TRQ) (Wilson *et al.*, 1991) where the greater frequency of negative emotional feelings and indicators of hyper-arousal correlate with tinnitus distress intensity. However, the majority of people in the Andersson and Vretblad study had a co-occurring

symptom of dizziness. When only those patients without a history of experiencing dizziness (n=33) in the sample of 127 tinnitus patients were included in the analysis the association between the ASI and the TRQ was not significant. Given that dizziness is strongly associated with symptom related fear, the overall results were unsurprising. Therefore, further research is needed to clarify the utility of anxiety sensitivity as an explanatory construct for tinnitus distress.

In context of qualitative research, an interview based study by Andersson and Edvinsson (2008) (1) used a modified grounded theory approach to generate descriptions of the consequences of living with tinnitus from the narratives of current or previous patients at a psychology service which provided treatment for people with tinnitus distress. Patterns of catastrophic thinking about future coping with tinnitus emerged which appeared to be associated with persistent arousal related symptoms of tinnitus distress, such as difficulties with relaxing and agitation. Such findings suggest that cognitive reappraisal of the experience of tinnitus may have been inhibited by inadequate emotional processing indicated by persistent symptoms of distress.

3.5.3 Avoidance

Four papers reviewed (4,5,8,10) aimed to explore the relationships between cognitive appraisal, avoidance behaviour and tinnitus distress. The studies were informed by a range of theoretical perspectives relating to cognitive and behavioural responses to health conditions.

Budd and Pugh (1996) (4) hypothesised that consistent maladaptive tinnitus coping styles could be important explanatory variables for persistent emotional distress associated with tinnitus. Maladaptive strategies for coping with stressful life events and chronic health conditions have been identified as moderators for poor psychological adjustment. Budd and Pugh developed the Tinnitus Coping Style Questionnaire (TCSQ), the 'maladaptive coping' factor was extracted where items included "Worrying that the noises will give you a nervous breakdown" and "Thinking that tinnitus has ruined the quality of your life". The 'passive coping' factor included avoidance behaviours indicated by items which involved the use of background noise or watching television to mask the sound. These factors significantly correlated with measures of emotional distress, the State-Trait Anxiety Index (STAI) (Spielberger *et al.*, 1983), the Beck Depression Index (BDI) (Beck *et al.*, 1961) and the study's self-report measure of tinnitus severity.

Given such findings, Budd and Pugh posited that tinnitus distress resulted from the emotional significance attached to tinnitus, generated by catastrophic thinking about its consequences and subsequent avoidance behaviours which together inhibit habituation to tinnitus, thereby persistent negative emotional response to tinnitus and arousal states are maintained. Overall, these findings are consistent with the components of the Input stage of the EPM. The model identifies negative cognitive appraisal following the onset of a stimulus elicits negative emotional responses. Attempts are then made to avoid such responses which inhibit emotional processing of the stimulus thereby, preventing the resolution of distress. Further, the assertion here that arousal may be symptomatic of unresolved distress is consistent with the EPM where arousal is considered an indicator of unprocessed emotional material.

Although the findings of Budd and Pugh (1996) are suggestive of the importance of emotional processing in tinnitus distress, there is a need for caution. Given that the tinnitus severity scale developed in the study was not validated, such evidence of the relationship between the psychological constructs investigated and tinnitus distress can only be considered speculative. Despite such limitations, the authors' explanation of the mechanisms involved in persistent symptom distress is supported by a number of further studies especially 5,8 and 10 in Table 3.1.

Building on the work of Andersson and Vretblad (2000), Hesser and Andersson (2009) (8) investigated whether behavioural avoidance could be an explanatory variable for the relationship between anxiety sensitivity and tinnitus distress. The literature around chronic pain has further identified that AS is associated with the predisposition to fearful avoidance coping styles. Hesser and Andersson hypothesised that the vulnerability to evade physiological and emotional experiences provoked by anxious responses to tinnitus perception would inhibit the resolution of symptom related distress. Significant correlations were found between AS, using the 11-item version of Anxiety Sensitivity Index (ASI) (Reiss *et al.*, 1986), and tinnitus distress which was assessed by two items relating to its emotional impact and functional impairment. Regression analyses were then conducted to explore whether avoidance due to tinnitus mediated the relationships between AS and tinnitus distress and functioning where avoidance was assessed by a single item which was 'I cannot expose myself to situations that may result in tinnitus or a deterioration of tinnitus'. Hesser and Andersson's findings indicated that avoidance behaviour was a significant contributor to the

relationship between AS and tinnitus distress even after anxiety and depression symptoms were controlled for. This suggests that schema relating to fearful emotional reactions to somatic symptoms and experiential avoidance may be important explanatory variables for tinnitus distress in the adult tinnitus population. However, since tinnitus distress and functioning and avoidance were not assessed by validated instruments, this precludes the generalisability of such results.

Cima *et al*. (2011) (5) sought to explore the applicability of the fear avoidance model of pain and disability as an explanatory framework for the generation and maintenance of tinnitus distress. Central to the model is that physical activity is avoided due to the predisposition to fearful reactions to pain motivated by the fear of further injury and where persistent avoidance behaviour is considered evidence of poor adjustment to chronic pain.

The authors examined responses from sixty one tinnitus patients to measures of tinnitus distress, assessed by the Tinnitus Questionnaire (TQ) (Hallam *et al*., 1988), tinnitus catastrophizing, tinnitus related fear and tinnitus vigilance and awareness evaluated by the Tinnitus Catastrophizing Scale (TCS), the Fear of Tinnitus Questionnaire (FTQ) and the Tinnitus Vigilance and Awareness Questionnaire (TVAQ) which were developed by the study's authors. Significant correlations were established between the variables investigated.

Findings from regression analyses, assessing the contributions of tinnitus catastrophizing and fear of tinnitus in explaining tinnitus distress, corroborated that catastrophic interpretation of the tinnitus noise may influence symptom related fear which together are implicated in the generation of tinnitus distress. Informed by the fear-avoidance model and their results, Cima *et al*. posited the potential explanatory processes for tinnitus distress. They proposed that heightened negative emotional states are elicited by the threatening interpretation of the tinnitus sound which enhances its perception. Negative cognitive appraisal then initiates behavioural attempts to escape the perceived threat preventing resolution of distress. Further, persistent arousal is considered as a consequence of such actions. The authors' conceptualisation of the processes involved is consistent with some components of the EPM, namely, negative cognitive appraisal and arousal are indicators of unprocessed emotional material. However, avoidance was not included as a variable within their regression analyses and therefore the validity of their model may be questioned.

Also informed by the fear avoidance model and building on the limitations of Cima *et al*.'s (2011) study, Kleinstauber *et al*. (2013) (10) investigated the role fear avoidance in tinnitus distress. In order to explore the relationship between these constructs the authors developed and validated the Tinnitus Fear-Avoidance Cognitions and Behaviours Scale (T-FAS).

Within the scale, the Tinnitus-related Fear Avoidance Behaviour factor (TAS-BT) aimed to assess avoidance of social and physical activities motivated by fearful beliefs that such behaviours will intensify the perception of tinnitus. Given that significant correlations were established between this factor and emotional reactions to tinnitus, assessed by the Emotional subscale of the Tinnitus Handicap Inventory (THI) (Kuk *et al*., 1990), Kleinstauber *et al*.'s findings are consistent with the escape action component of experiential avoidance. The construct of experiential avoidance identifies that attempts to avoid situations which are believed will intensify somatic symptoms will in the long term prevent the resolution of psychological distress. Their conceptualisation of avoidance partially reflects the Avoidance factor of the EPM. However, the scale does not assess the further dimension of experiential avoidance, attempts to avoid distressing thoughts and feelings about somatic symptoms, which are identified in the EPM. Therefore, further research is warranted to explore the wider conceptualisation of experiential avoidance in the generation and maintenance of tinnitus distress.

3.5.4 Acceptance

Five of the papers reviewed (6,7,9,11 and 12 in Table 3.1) concerned the construct of tinnitus acceptance where the individual is able to be in the presence of the tinnitus sound without a need to respond emotionally or behaviourally to the sensation thus indicating the experience of tinnitus has been emotionally processed successfully.

The first study (11) considered the role of emotional competencies in tinnitus acceptance. The further studies (6,7, 9, and 12) sought to identify the psychological processes involved in acceptance and therefore, detect the inhibitory mechanisms for acceptance. The studies (Westin *et al*., 2008; Croft *et al*., 2013a; Croft *et al*., 2013b) (6,7,12) developed instruments which aimed to assess emotional and behavioural dimensions of tinnitus acceptance.

Schutte *et al*. (2009) (11) hypothesised that global adaptive emotional functioning, conceptualised as emotional intelligence, may facilitate tinnitus acceptance. The study's authors considered that the Emotional Intelligence Scale (EIS) (Schutte *et al*., 1998) captured the range of emotional competencies identified in the construct of emotional intelligence (Salovey and Mayer, 1990; Mayer *et al*., 2004) which enable effective emotional functioning. It reflects the ability to recognise and understand emotions in self and others, use emotions to assist decision making and manage emotions in both self and others. Schutte *et al*. (2009) theorised that the ability to recognise negative emotional reactions to tinnitus would allow for the regulation or reduction of such responses thereby facilitating acceptance.

Structural equation modelling was used to test the hypothesised predictive paths between the variables of emotional intelligence, assessed by the EIS and by measures of tinnitus acceptance, the Tinnitus Experience Questionnaire (TEQ) (Croft, 2008), tinnitus distress, the Tinnitus Reaction Questionnaire (TRQ) (Wilson *et al*., 1991) and general psychological distress, the General Health Questionnaire (GHQ) (Goldberg and Williams, 1988).

While their findings established that acceptance of tinnitus was associated with lower levels of tinnitus distress higher emotional intelligence was not associated with less tinnitus distress. Given such results Schutte *et al*. (2009) concluded that the construct of emotional intelligence, as tested in their study, played no important role in protecting individuals experiencing distress related to tinnitus. Its limitations as a predictive variable for less tinnitus distress may be explained by the instrument used in the study: the Emotional Intelligence Scale. Of the 33 items in this scale, only eight relate to intrapersonal emotional awareness and understanding styles whereas the majority of items reflect interpersonal emotional competencies which may not be important to protect against tinnitus distress. Given the study's findings further research is warranted that is able to identify and assess the abilities relating to the recognition and understanding of emotional experiences which may be explanatory variables for tinnitus distress.

Westin *et al*. (2008) (12) sought to develop a self-report measure of tinnitus acceptance for use in therapeutic interventions. The creation of their Tinnitus Acceptance Questionnaire (TAQ) was informed by measures of psychological acceptance, the Acceptance and Action Questionnaire (AAQ) (Hayes *et al*., 2004) and the Chronic Pain Acceptance Questionnaire-Revised (CPAQR) (McCracken *et al*., 2004).The Tinnitus Acceptance Questionnaire contains two factors; 'activity

engagement' which reflects the willingness to engage in activities regardless of tinnitus-tinnitus acceptance and 'tinnitus suppression'. Westin *et al*. hypothesised that tinnitus suppression would produce the opposite of the desired effect, that is, increased frequency and intensity of tinnitus related distressing feelings.

The two factors are consistent with the construct of experiential avoidance; 'activity engagement' reflects its escape component and 'tinnitus suppression', its avoidance component. Further, the tinnitus suppression factor is consistent with the EPM where suppression of emotional states inhibits emotional processing and the experience of persistent invasive negative emotions indicate unprocessed emotional material. The results from regression analyses identified that tinnitus distress significantly predicted activity engagement which indicates that negative emotion responses to tinnitus determine attempts to avoid exposure to the sound. However, no significant results were found regarding tinnitus suppression.

Building on the work of Westin *et al*. (2008), Hesser *et al*. (2015) (9) examined responses from 362 tinnitus patients to the Tinnitus Acceptance Questionnaire (TAQ), the Tinnitus Handicap Inventory (THI) (Kuk *et al*., 1990) and the Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983). Correlational analyses showed that acceptance was strongly and inversely related to tinnitus severity and anxiety and depression symptoms. Multivariate regression analysis revealed that acceptance accounted for unique variance beyond anxiety and depression symptoms. Such evidence further indicates that experiential avoidance, as conceptualised by the TAQ, could represent an important explanatory variable for symptom distress in the general tinnitus population. However, this submission must be treated with caution for several reasons. First, the relationship between activity avoidance and tinnitus distress may have been inflated by the composition of the sample (n=77) used in the development of the scale. Nearly a third (26%) of participants were unable to undertake full employment due to the impact of tinnitus on their psychological wellbeing. In support of this premise, items in the 'activity engagement' factor included 'My chronic tinnitus has led me to decrease my engagement in former activities".

Second, the results of regression analyses where tinnitus distress was not found to be a predictor of tinnitus suppression might be explained by the paucity of items in the scale. In addition, it may be that the items do not capture those dimensions of experiential avoidance relating to emotional suppression which may be implicated in persistent tinnitus distress.

Third, there is a common understanding that the unwillingness to be exposed to tinnitus related distressing emotions motivates activity engagement in those people who are distressed by their tinnitus whereas the TAQ considers such behaviours as indicators of tinnitus acceptance. Overall, given such observations, future research is needed where the multidimensional concept of experiential avoidance is assessed in order to elucidate, conversely, the psychological mechanisms which facilitate tinnitus acceptance.

Taking into account the conceptual limitations of the TAQ, Croft *et al*. (2013a) (6) sought to develop a measure that was able to more comprehensively conceptualise the tinnitus response patterns which reflect its acceptance. They hypothesised that acceptance would be characterised by neutral reaction to the tinnitus sound both emotionally and behaviourally. Three subscales of their Tinnitus Response Scales (TRS) were identified. The Defeat factor indicates negative cognitive appraisals and beliefs and catastrophizing about the consequences of tinnitus. It includes items such as 'I despair because of my tinnitus noise'. The Control factor identifies attempts to suppress the awareness of tinnitus denoted by items such as 'I work to suppress the tinnitus noise'. The third factor of Acceptance reflects unconcern or non- emotional reactivity by statements such as 'I willingly accept the presence of my tinnitus noise'. Tinnitus distress, as assessed by the Tinnitus Reaction Questionnaire (TRQ) (Wilson *et al*., 1991), was significantly greater in those individuals who had an exaggerated perception of tinnitus threat and maladaptive attempts to control or avoid the experience of tinnitus.

Given that in the TRQ greater frequency of tinnitus related distressing feelings equates to higher tinnitus distress severity, the findings are consistent with some components of the EPM. Specifically, negative appraisal initiates emotional distress which together, generate attempts to avoid the source of distress thus preventing the resolution of distress which is manifested by persistent distressing emotional experiences. While the scale represents an important contribution to the understanding of the cognitive, emotional and behavioural processes associated with tinnitus distress, specific items which assess attempts to control emotional responses to tinnitus were not included in their scale.

Croft *et al*. (2013b) (7) sought to build on their earlier findings and evaluate how the concept of habituation may be related to the previous study's conceptualisation of tinnitus acceptance. Habituation has been historically considered within the literature as the primary indicator of non-reactivity to

tinnitus in terms of emotional and behavioural responses. However, no prior studies have evaluated the possible overlap between tinnitus habituation and acceptance processes in the experience of tinnitus distress. Croft *et al*. examined responses from a sample of 273 participants to the Tinnitus Habituation Scale (THS) and to the Tinnitus Reaction Questionnaire (TRQ) (Wilson *et al.*, 1991). The THS was developed from seven acceptance items from the Tinnitus Response Scales (TRS), along with nineteen items that tapped aspects of tinnitus habituation from the original 87 items which formed the basis of the TRS. Exploratory factor analysis showed that a single factor solution explained 40% of the variance in the scale's items. Thus, the habituation and acceptance items loaded onto a single factor that described the processes of tinnitus habituation and tinnitus acceptance.

Given their findings, Croft *et al*. concluded that tinnitus habituation and acceptance reflected different but related aspects of the tinnitus adaptation process. The authors further considered that acceptance may represent the cognitive response that determines a lack of need to respond emotionally or behaviourally thus facilitating the automatic behavioural processing of tinnitus noise i.e. tinnitus habituation. The implication here is that negative appraisal generates emotional and behavioural control strategies which, together, serve to maintain tinnitus distress. Therefore, the study introduced a conceptual synthesis to explain the tinnitus adaptation process where, historically, habituation has been considered as central to the understanding of tinnitus adaptation. However, given the participants relatively low mean tinnitus distress level (M =1.07, SD =.90), as assessed by the Tinnitus Reaction Questionnaire (TRQ) (Wilson *et al.*, 1991), further research is warranted in order to establish whether the constructs conceptualised in the study are significantly correlated with tinnitus distress.

3.5.5 Control of emotional expression

Two of the papers (1 and 3 in Table 3.1) reviewed explored control of emotional expression in people who were distressed by their tinnitus. In the first study, (Andersson and Edvinsson, 2008) (1) patterns of inhibited emotional expression emerged. The second study (Bartels *et al.*, 2010) (3) aimed to establish if the predisposition to restricted emotional disclosure was implicated in tinnitus distress.

The EPM identifies that the control of emotional expression may be shaped by schemas, beliefs or 'emotional rules' concerning the value and function of the

experience of emotions and their expression and judgments on the acceptability of negative emotions. The influence of such schema on persistent symptom distress emerged from participants' experiences of tinnitus explored by Andersson and Edvinsson (2008) (1). In their qualitative study a modified grounded theory approach was used to generate descriptions of the consequences of living with tinnitus. Through their analysis, the contrasting subcategories of 'private identity' and 'public identity' were identified. 'Private identity' reflected experiences of helplessness, panic and a sense of life as a constant struggle to cope. 'Public identity' concerned the public portrayal of a positive self-image of coping with tinnitus. It appeared that the participants' beliefs that others would not understand their suffering inhibited their expressions of distress motivating the creation of their public representation of coping. The implication of such findings is that this dimension of emotional suppression served to intensify their distress which is consistent with the conceptualisation of the Suppression factor of the EPS-25. While the study's findings have made an important contribution to the understanding of schemas that underpin the inhibition of emotional expression in people with tinnitus distress, further qualitative research would enable the exploration of additional patterns of beliefs which may be implicated in the control of emotional expression.

Bartels *et al*. (2010) (3) further explored the relationship between tinnitus distress and control of emotional expression in the context of personality theory. Negative emotional schema, characterised by the vulnerability to experience increased negative emotions defined as negative affectivity (NA) and the predisposition to avoid sharing emotions with others due to fears of how they will react or social inhibition (SI) is part of the broader construct of type D personality.

In their study, 265 tinnitus patients completed a set of self-report measures of type D personality, the 14-item Type D scale (DS14) (Denollet, 2005), of anxiety and depression, the Hospital Anxiety and Depression Scale (HADS) (Spinhoven *et al*., 1997), of mental fatigue and irritability, the Maastricht Questionnaire (Appels *et al*., 1987), the Short-Form Health Survey (Aaronson *et al*., 1998) and the Tinnitus Reaction Questionnaire (TRQ) (Wilson *et al*., 1991). Structural equation modelling was used to analyse the relationship between the variables. Type D personality was found to be a predictor of increased anxiety and depressive symptoms and tinnitus related distress.

While the findings suggest that the tendency to inhibit emotional expression is implicated in tinnitus distress, they should be treated with some caution. The construct of SI reflects generalised social anxiety which motivates the internalisation of emotions in social interactions. Therefore, further research is needed in order to explore whether additional schemas, which reflect value judgments concerning the generalised expression of negative emotions, may also be important contributory variables.

3.6 Summary

Emotional processing involves the interplay of all mechanisms in the EPM. The model is a system model moving from the initial Input stage where an initial event or stimulus requires processing via the Emotional Experience stage to the Output stage. The control of emotion experiences which determines poor emotional processing is represented in all stages of the EPM.

The literature reviewed has explored a range of constructs as explanatory variables for the generation and maintenance of tinnitus distress. Informed by health models and, in particular, those relating to chronic pain, the studies identified the roles of negative appraisal, emotional responses to appraisal, avoidance behaviour, maladaptive schemas and control of emotional expression in poor psychological adjustment to tinnitus. Several personality factors and predispositions to habitual patterns of emotional and behavioural responses which reflect emotional control were further identified as potentially influential on the tinnitus adaptation process. However, a comprehensive process model which describes and explains the interactions between psychological variables identified and tinnitus distress has yet to be presented.

The first stage of the EPM relates to an event or onset of a stimulus, its cognitive appraisal and the influence of emotional schemas on the process of appraisal. The model considers that appraisal of the stimulus will shape the emotion that the person experiences. The ‘Avoidance’ factor assesses the tendency to avoid the stimulus that has elicited an emotional response following appraisal. The factor reflects both internal avoidance and avoidance actions and a generalised avoidant attitude towards exposure to unpleasant feelings.

The literature has identified that the predisposition to tinnitus related negative appraisals and avoidance behaviour is implicated in the generation and persistence of tinnitus distress which is consistent with the EPM components in

this stage. However, the interpretation of findings presented by some of the studies (Westin *et al.*, 2008; Hesser *et al.*, 2015) may be contradictory to the common understanding of behaviours which reflect tinnitus acceptance. The assertion that engagement activity reflects acceptance fits with fear avoidance models developed in the context of pain research and the escape component of experiential avoidance. However, it is not characteristic of clinical observations where activities are undertaken to avoid exposure to the perception of and emotional responses to tinnitus which is consistent with the avoidance component of experiential avoidance and with the EPM. The conceptual synthesis presented by Croft *et al.* (2013b) identified that negative appraisal generates emotional and behavioural control strategies which, in accordance with the concept of experiential avoidance, will maintain tinnitus distress thus inhibiting habituation to the tinnitus noise. While this theoretical perspective incorporates a range of emotional processing related constructs, implicating their role in tinnitus distress, Croft *et al.*'s study was unable establish their associations with tinnitus distress severity given the relatively low tinnitus distress of participants.

In second stage of the EPM emotional processing is inhibited by the failure to recognise emotions, a lack of emotionality and emotional detachment which are assessed by the 'Emotional Experience' factor. Emotional processing is further constricted in this stage by attempts to control or suppress feelings which are measured by the 'Suppression' factor. The control of emotional states and their expression may be further shaped by beliefs or 'emotional rules' concerning the value and function of the experience of emotions and their expression and judgments on the acceptability of negative emotions.

Little evidence has, as yet, been presented relating to the components in this stage of the EPM in the context of tinnitus research. The construct of emotional intelligence, a measure of the ability to recognise and understand emotions in self and others and manage emotions in both self and others, was not found to be a protective factor against tinnitus distress (Schutte *et al.*, 2009). Given such findings, future research examining such relationships using a broader array of emotional intelligence conceptualisations and measurements is needed to address this absence of evidence.

The influence of schemas on the control of emotional expression in public interactions motivated by fear of social rejection and the belief that others could not understanding their suffering has been identified as a contributory factor to tinnitus distress (Andersson and Edvinsson, 2008; Bartels *et al.*, 2010). However,

the role of value judgements concerning the generalised expression of negative emotions identified in the EPM has not, as yet, been explored.

Significant relationships were established between the emotional processing variables of experiential avoidance, control of emotional expression and tinnitus distress (Bartels *et al.*, 2010; Croft *et al.*, 2013a; Croft *et al.*, 2013b), as assessed by the Tinnitus Reaction Questionnaire (TRQ) (Wilson *et al.*, 1991). Greater frequency of distressing tinnitus related feelings and symptoms of hyper-arousal were also associated with symptom distress intensity, as assessed by the Tinnitus Reaction Questionnaire (TRQ) (Wilson *et al.*, 1991). Thus, the studies' findings support the proposition that symptoms of tinnitus distress reflect unprocessed emotion material as conceptualised in the EPM.

A number of studies were not able to establish a strong association between the construct of interest and tinnitus distress (Westin *et al.*, 2008; Schutte *et al.*, 2009). The lack of association in these studies could be explained by the conceptual limitations of the path models and the studies' design and measures. The inclusion of participants with physiological and psychological disorders and use of measures which were not validated preclude the generalisability of findings to the general adult tinnitus population (Budd and Pugh, 1996; Andersson and Vretblad, 2000; Hesser and Andersson, 2009). Further research supported by validated assessment tools and with appropriately defined samples is therefore required to extend existing knowledge.

While the literature reviewed has evidenced the complexity of the phenomenon of tinnitus distress researchers have not currently widely incorporated constructs from emotion and experiential theories despite the amassing knowledge concerning the role of emotional control in the generation and maintenance of psychological distress.

Overall, the review of the literature has allowed for the following conclusions. First, the construct of emotional processing is implicated in the development and maintenance of tinnitus distress. Second, current theoretical perspectives of tinnitus distress are accommodated within the EPM. Finally, the construct of emotional processing provides an innovative cohesive explanatory framework for tinnitus distress.

3.7 Research aim and research question

As the EPM has not hitherto been applied to the investigation of tinnitus distress the aim of the study was to investigate if tinnitus distress can be explained by emotional processing identified within the theoretical framework of the EPM. It is anticipated that the findings of the study will inform clinical practice as well as indicate further areas for research. In order to meet this aim and expected outcomes the following research question has guided the study.

What is the relationship between emotional processing and tinnitus distress?

The main study used self-report measures of emotional processing and tinnitus distress to investigate the association between these constructs. Interviews were then conducted to address the research question with a further sample of people who experienced tinnitus distress. In the next chapter the study's methodology, design and methods are presented.

Chapter 4: Methodology, research design and methods

4.1 Introduction

The first section of this chapter will present the rationale for the main study's methodology, describe its design and sample, review the study's measures and present the procedure including the ethical protocol. The second section of this chapter will introduce the aim of the interviews which were conducted with an additional sample of people who experienced tinnitus distress. It will describe the sample and the procedure including the ethical protocol which informed how access to participants was gained. Finally, the methods of data collection and analysis are presented.

4.2 Rationale for the main study's methodology

To date, the relationship between emotional processing and tinnitus distress has not been specifically investigated. As a first stage, the present study sought to address this by determining whether or not an association exists between them. To do this a correlation survey design was used in which participants presenting to tinnitus clinics were asked to complete two surveys, one for tinnitus distress and one for emotional processing, which could be correlated with each other to test for any association between the variables. Exploratory correlation studies, by their economy of design and ability to identify attributes of a large population from a small amount of individuals (Creswell, 2014), are used as initial strategies for research enquiry. In the context of experimental approaches and longitudinal studies, their findings inform further examination, with the use of additional measures, to assess the interaction between clinical phenomena (Portney and Watkins, 2009).

4.3 The survey

A cross-sectional, survey-based design was chosen to examine the relationship between emotional processing deficits and tinnitus distress. The TRQ was used to measure tinnitus distress and the EPS-25 was used to measure emotional processing. Data were collected from forty-seven adult participants, recruited

from referrals for tinnitus assessment to one NHS Trust's Audiology Outpatients Clinics where the researcher was employed.

4.3.1 Sample

A sample of forty-seven individuals was recruited from the Audiology Outpatient Clinics of one NHS Trust, between January 2011 and March 2013. There were 28 males (60%) and 19 females (40%). The mean age was 58.5 (SD=15.4). The selection of the sample was determined by the inclusion and exclusion criteria where all participants were required to be over 18 years of age, able to communicate in English, without a history of chronic physical, mental health conditions or ear-related disorders apart from tinnitus. The adherence to the above inclusion and exclusion criteria promoted the validity of the study. A sample size calculation was required by the Trust's research governance policy in order to gain approval for the conduct of the study. Given that there were no previous studies to inform the sample size, the online sample size calculator, G* Power, was used where the total number of potential participants over the estimated three month recruitment period was entered (n=77) and the confidence level of 95% and confidence interval of .05 were selected which generated a sample size of 64.

4.3.2 Measures

The aim of the survey was to establish if there is a relationship between emotional processing and tinnitus distress. To address this aim, self-report rating scales were identified. The EPS-25 was selected to assess participants' emotional processing and the TRQ, to assess the level of tinnitus distress. Demographic and health information was gathered by asking respondents to complete a simple questionnaire. This section will present the scales used in this study, the rationale for their selection and finally, these measures will be reviewed.

4.3.3 Demographic and health questionnaire

The demographic and health questionnaire gathered data firstly, on the demographic variables of gender, age, duration of tinnitus and relationship status of the participants and secondly, on their physical and mental health status (see Appendix 4). The rationale for the collection of demographic and health data was to allow for the identification of demographic variables which may be implicated

in the relationship between the constructs under investigation and to identify those participants who fulfilled the study's exclusion criteria of ear-related disorders apart from tinnitus or chronic physical conditions or mental health disorders.

4.3.4 Selection of measures

It is essential that any measure used in clinical practice and the research agenda should have adequate psychometric properties, that is, the following attributes. The instrument should reliably measure what it purports to measure (construct validity), it should be in broad agreement with other measures of the same or similar constructs (convergent validity), it should also give the same result when applied repeatedly (test-retest reliability) and it should be sensitive to the effects of treatment (Baguley *et al.*, 2013). The details and psychometric properties of the measures will now be presented and appraised.

4.3.4.1 The EPS-25

The Emotional Processing Scale (EPS-25) (Baker *et al.*, 2010) was used in this study. The EPS cannot be included in the thesis as a result of copyright issues. Its selection was determined by its ability to quantify different types of emotional processing styles, associated with psychological or physical conditions. The EPS has been used in studies of anxiety and panic disorders (Baker *et al.*, 2004; Baker *et al.*, 2012), cancer (Lothian, 2002) chronic pain (Esteves *et al.*, 2013; Horsham and Chung, 2013), and neurological symptoms (Reynolds *et al.*, 2014).

The participants completed the EPS-25 which is a twenty-five item self-assessment of a person's emotional processing in the week prior to their rating. It assesses the mechanisms involved in emotional processing and whether there are signs of unprocessed emotional material (Rachman, 1980). The scale is based on actual events and behaviours in recent memory to avoid preconceptions that the participant might have concerning their emotional life. The EPS instructions are to think back over every day of the previous week and check any diary record of events and appointments in order to 'fix the last week firmly in your mind'. Rating the emotional reactions of the previous week allows the scale to be used on a repeated basis in the therapeutic context.

The items on the scale are worded in statement form relating to emotional reactions in the past week, such as 'I smothered my feelings'. The person is

instructed to rate the extent to which each statement applies to the way they felt or acted during the last week. The items capture a wide range of emotional responses without reference to their intensity and frequency. Agreement to the statement is rated from 0 to 9, where agreement with the statement represents problematic processing. To calculate the mean total EPS-25 score, the items are added together and then divided by 25. The scores for each subscale are added and then divided by the number of items in the subscale i.e. 5 to produce the mean subscale score.

In the pilot version of the EPS-25, the EPS-38, (Baker *et al.*, 2007) strong correlations with other theoretically related constructs of emotional behaviour, the Courtauld Emotional Control Scale (CECS), (Watson and Greer, 1983), the Toronto Alexithymia Scale (TAS-20), (Bagby *et al.*, 1994) were established. The 38-item, eight-factor structure was then revised to a 25-item, five-factor structure. The five factors of the EPS-25 are: 1) Suppression; 2) Signs of Unprocessed Emotion; 3) Controllability of Emotions; 4) Avoidance; 5) Emotional Experience. The EPS-25 has been shown to have good internal consistency (Cronbach's α=.92) and test-retest reliability (r=0.74) (Baker *et al.*, 2007). Responsiveness to changes of symptom severity in treatment-based research has been demonstrated (Baker *et al.*, 2012).

4.3.4.2 The TRQ

In this study tinnitus distress was assessed by the Tinnitus Reaction Questionnaire (TRQ) (Wilson *et al.*, 1991) - see appendix 6. The selection of this measure of tinnitus distress was determined by first, its ability to assess psychological distress associated with tinnitus and second, its ability to distinguish individuals with tinnitus who cope with their sensory disorder and are not distressed, from those who do not cope well and are distressed by their tinnitus.

The scale was developed to provide a reliable rapid assessment tool of tinnitus distress and it has been widely used in the research agenda (Andersson *et al.*, 2001; Hébert and Carrier, 2007; Miguel *et al.*, 2014). The TRQ is a 26-item self-report scale which asks participants to rate their emotional and behavioural responses to tinnitus on a five-point scale from 0 (not at all) to 4 (almost all the time). The items relate to symptoms of emotional distress e.g. 'My tinnitus has made me feel tormented'. Item ratings are aggregated to give a score range from

0 to 104, with higher scores denoting greater tinnitus distress. Scores of 17 or greater indicate that tinnitus distress is experienced.

The TRQ has moderate to high correlations with measures of symptomatology, the Bendig version of the Taylor Manifest Anxiety Scale (MAS) (Bendig, 1956), the Beck Depression Inventory (BDI) (Beck *et al.*, 1961) and the Spielberger State-Trait Anxiety Inventory (STAI) (Spielberger *et al.*, 1970) but low correlation with the Neuroticism subscale of the Eysenck Personality Questionnaire (EPQ) (Eysenck and Eysenck, 1975). This indicates that it is a useful index of psychological distress related to tinnitus.

The TRQ has good internal consistency (Cronbach's α=.96) and test-retest reliability (r =0 .88) (Newman and Sandridge, 2004). The responsiveness of the TRQ to evaluate treatment interventions has been established by a small number of studies where the sample sizes were adequate to demonstrate clinically significant changes (Henry and Wilson, 1998; Andersson *et al.*, 2002; Kaldo-Sandström *et al.*, 2004).

There is no consensus, to date, as to whether the TRQ is able to identify specific dimensions or subscales of distress within the scale. In the development of the TRQ, Wilson and Henry (1991) initially indicated that there were four factors: Factor 1 reflects general distress, Factor 2 involves items relating to interference with work or leisure activities, Factor 3 overlaps with Factor 1 and also includes more severe signs of distress and Factor 4 consists of items that relate to avoidance of activities. However, there are several items which reflect severe distress included in Factor 1 which are omitted from Factor 3 such as 'My tinnitus makes me feel helpless', 'My tinnitus has led me to despair' and 'My tinnitus has led me to think about suicide'. Wilson and Henry (1991) reported the results of further factor analyses in the same study which produced two factors: Factor 1, general distress and Factor 2, avoidance. However, the avoidance factor includes only two items 'My tinnitus has led me to avoid social situations' and 'My tinnitus has led me to avoid noisy situations'. While Wilson and Henry suggested that the two factor solution might be useful in describing some individual differences in patterns in response to tinnitus, in their later study the authors described the TRQ as a four factor measure (Wilson and Henry, 1997).

Whilst it is agreed that factor analysis is an interpretative process (Pett *et al.*, 2003), the lack of clarity here concerning the potential dimensions or subscales within the TRQ has led to conceptual assumptions in the literature. It could be

argued that this has undermined the validity of research where such subscales have been explored.

For example, in the validation study of the French version of the TRQ the four factor solution was adopted (Meric *et al.*, 2000), which suggests that in future research this solution may also be assumed. In two highly regarded reviews of tinnitus distress measures four subscales have been ascribed to the TRQ (Kennedy *et al.*, 2004; Kamalski *et al.*, 2010). This suggests to both clinical and research communities that its four dimensions are able to identify patterns of responses to tinnitus. In contrast, in their review of tinnitus self-report inventories Baguley *et al*. (2013) suggested, based on factor analyses of the Swedish version of the TRQ in an unpublished thesis (MacDonald, 2002), that the scale contains one reliable factor. The inconsistencies regarding its factor solution described by Wilson *et al.* (1991) and the questionable validity of its four factor solution precludes the assumption that specific dimensions of tinnitus distress may be assessed by the TRQ. Given that analysis of its factor structure has not yet been published, in the context of this study factor analyses was warranted. This would establish whether correlations between its subscales and those of other self-report measures is justified in future research. Therefore, factor analyses of the TRQ were conducted and the results of these analyses are reported in Chapter 4.

4.4 Procedure

The following section will describe how the study was conducted in accordance with ethical guidelines which included stakeholder consultation, appropriate access to potential participants and ethical methods of data collection.

4.4.1 Ethical considerations and ethical approval

Before the study was undertaken its proposed aim and methodology were presented to both the Chair of the British Tinnitus Association (BTA), the national support organisation for individuals with tinnitus, and to local BTA support groups. Both groups agreed that the study could contribute to future health care and that the methods proposed were acceptable and acknowledged the sensitive nature of the research. The study was then approved by the National Research Ethics Service and its sponsorship was undertaken by the NHS Trust which provided the setting for the study. The Trust's research governance policy further informed the study's protocol: the time scale for recruitment to the study was

required within the approval process. The study's recruitment time scale was initially stated as three months based on the total number of potential participants identified from referrals to the Audiology Consultant Outpatients Clinic within this time frame (n=77) which informed the sample size calculation. Due to logistical problems with recruitment, further ethical approval was gained to extend the period for recruitment and to incorporate participant recruitment from referrals to non-medical Audiology Outpatients Clinics for tinnitus assessment.

4.4.2 Access to participants

The proposed study's methodology was presented to clinical and administrative heads of departments where approval for the conduct of the study in the NHS Audiology Consultant Outpatients Clinic was given, and where agreement to access data relating to potential participants was gained. This procedure was repeated following ethical approval to extend the study's recruitment to non-medical Audiology Outpatients Clinics. To identify potential participants, all referral letters for tinnitus assessment to the Audiology Clinics were screened for potential participants who fitted the inclusion criteria. This included patients being: aged eighteen or above, able to communicate in English, and without a history of chronic physical or mental health conditions or ear disorders apart from tinnitus. Where these patients met these criteria an information letter which explained the purpose of the study was sent prior to their clinic appointment. This letter informed patients that they might be invited to take part in the study during their appointment attendance.

4.4.3 Data collection

During their attendance, potential participants were identified and, if interest in participation was expressed, they were given the opportunity to read the Participation Information Sheet (PIS see Appendix 3) and to ask questions relating to the study. The PIS explained the aim of the study and what their participation would involve which was completion in private at home of a questionnaire booklet which they would then be asked to return, by post, in a pre-paid envelope marked private and confidential. The PIS made it clear that they would be free to withdraw from the study at any time without giving a reason and this would not affect their standard of or access to care. The sheet also specified that the study did not aim to directly help participants involved but that the data collected could improve

future treatment for individuals with tinnitus. This section further confirmed that their participation would be kept confidential, that ethical principles would be followed and that information gathered about them would be handled in confidence. In the second section of the Participant Information Sheet, contact information for support was provided if distress was experienced as result of the completion of the questionnaire booklet. Further contact information concerning the complaints procedure if any concerns were raised relating to the study was also made available. Finally, the PIS explained that the study has been reviewed and approved by the National Research Ethics Service.

Following reading of the PIS, if participants wanted to be involved with the study they were asked to read and sign a consent form (see Appendix 5). They were then given the questionnaire booklet and asked to keep a copy of the Participant Information Sheet, in case they should wish to refer to this in the future. Participants were reminded that they should fill in the questionnaire booklet and return it as soon as possible in the prepaid envelope. The potential participant identification data, study log books, consent forms and the anonymised returned questionnaire data were stored in a secured code access only location.

Sixty-one participants were recruited into the study initially. Five participants did not return the questionnaire booklets. Seven participants were excluded due to missing data and two participants were excluded due to recent mental health episodes which were identified in the demographic and health questionnaire. This left a total of 47 participants. No participants reported the need for emotional support following the completion of the measures.

4.5 Data analysis

As discussed in the section relating to the study's measures, to date, there is no consensus on the factor structure of the TRQ and, hitherto, factor analysis has not been published. Therefore, in order to establish the factor structure of the TRQ, which would indicate whether it measures subscales of tinnitus distress which could be correlated with the EPS-25 and the EPS-25 subscales, factor analysis was conducted.

Descriptive statistics were computed for demographic data and EPS-25 and TRQ scores. Mean and standard deviations were used to describe the sample in terms of age. Means, standard deviations and 95% confidence intervals were used to describe the EPS-25 total scores and the EPS-25 subscale scores. Following tests

for normality of distribution, which will be discussed in more detail in chapter 5, median and interquartile ranges were used to describe the total TRQ scores.

Given the non-normal distribution of the total TRQ scores, Spearman's rho correlations were used to explore the relationship between the total TRQ scores and the total EPS-25 scores and between the total TRQ scores and the EPS-25 subscale scores. The results of this will be discussed in detail in chapter 5.

4.6 The interviews

The survey evaluated the concept of emotional processing and its role in the experience of tinnitus distress using a quantitative approach. As will be discussed in chapter 5, the results of this established that those individuals who were more distressed by their tinnitus processed their emotions less effectively than those who were less distressed. The data generated by the survey have contributed new knowledge to the research agenda by establishing an association between emotional processing styles and tinnitus distress. However, the nature of the design, which examined the statistical relationship between a set of variables, precluded the exploration of a deeper understanding of the roles of emotional processing styles and of the components of the Emotional Processing Model in the generation and maintenance of tinnitus distress which are not assessed by the Emotional Processing Scale. This gap prompted the conduct of a modest complementary qualitative study with a small sample of people who experienced tinnitus distress. The additional use of qualitative research to supplement the quantitative data has the potential to increase the validity of the study's findings in order to generate insightful data which, together, can inform future research and treatment interventions (Portney and Watkins, 2009).

The sample comprised six attendees at tinnitus support groups who were experiencing tinnitus distress, as identified by the Tinnitus Reaction Questionnaire (Wilson *et al.*, 1991). While there are no rules for sample size in qualitative enquiry (Braun and Clarke, 2013), six interviews can provide sufficient data to support themes generated from participant narratives (Guest *et al.*, 2006). This is evidenced by a range of studies on patients' perceptions of living with their health conditions such as patients' experiences of hospitalisation (Gros *et al.*, 2017) and counselling (Marchant and Payne, 2002), living with a life threatening genetic disorder (DiMillo *et al.*, 2013) and experiences and perceptions around social exclusion and mental health conditions (Holmes *et al.*,

2004). In contrast, criticism has been levelled at superfluous sampling where the data tend to become repetitive, thus the qualitative analysis loses depth (Mason, 2010). Further, there are ethical implications of burdening more participants than are needed (Guetterman, 2015).

Individual interviews were conducted and recorded and the data generated were transcribed and subjected to thematic analysis. The process produced themes which informed the findings. The findings from the interviews are presented in chapter 6.

The next section will first, present the aim of the interviews. Second, the sample and how it was generated will be described. Third, ethical considerations relating to the conduct of the interviews will be explained. Fourth, the interview process is described and finally, the data analysis method is presented.

4.7 Aim of the interviews

The aim of the interviews was to complement the main survey, and to inform clinical practice as well as indicate further areas for research. In order to address the research question which involved the exploration of the role of emotional processing in tinnitus distress, face-to-face interviews were undertaken. The literature has acknowledged the utility of interview based research. Braun and Clarke (2013) considered that interviews allow for the elicitation of participants' experiences and perspectives and capture their language and concepts in relation to the research topic. Gibbs (2008) suggested that narratives are a fundamental way in which individuals organise their understanding of the world and where they make sense to themselves, of their past experiences, and key events. In the creation of such narratives the individual's current evaluation and meaning of their health condition can be explored (Hall, 2010). Further, Kleres (2011) asserted that the nature of the narrative interview structure supports descriptive accounts of cognitive and emotional responses to the onset of health disorders. The selection of narrative interviews for the study is further supported by Sools *et al*. (2015), who suggested that the narrative approach to health research allows for a voice to be given to individuals who live with challenges to health and wellbeing. Additionally, the method provides insight into how health care could be improved and bridges the gap between knowledge gained by quantitative studies and clinical practice.

4.8 Sample

Six participants, recruited from local tinnitus support groups, were interviewed concerning their experience of living with tinnitus and to explore their emotional processing styles. The selection of the sample was determined by the inclusion and exclusion criteria adopted by the main study where all participants were required to be over 18 years of age, able to communicate in English, and without chronic physical conditions or mental health disorders or ear-related disorders apart from tinnitus. Two further exclusion criteria were identified in this phase of the study. Those people who did not experience tinnitus distress as indicated by a score of less than 17 on the Tinnitus Reaction Questionnaire were excluded. In addition, those people who had received treatment for their tinnitus from the researcher, who was previously a Tinnitus Therapist in the area where the study was conducted, were also excluded. The latter criterion was introduced to ensure that participants felt at ease to express their experiences to someone with whom they had not previously had a therapeutic relationship.

4.9 Ethical considerations

The following section will describe how the study was conducted in accordance with ethical guidelines which included stakeholder consultation, appropriate access to potential participants and ethical methods of data collection.

Before the study was undertaken its aim and the approach to be adopted were presented to the Coordinators and Committees of two local British Tinnitus Association (BTA) support groups where the study would be conducted. Agreement was gained that the study's aim could benefit future services for individuals with tinnitus and the proposed study design was deemed acceptable. The research was approved and sponsored by the University where the researcher was enrolled for doctoral studies.

4.9.1 Access to participants

The researcher attended the two local BTA support groups where a presentation was given to attendees at the groups. The presentation, which was based on the Participant Information Sheet (presented in Appendix 10), outlined the study's aim and data collection method and its inclusion and exclusion criteria.

Following the presentation information packs were available for collection during the meetings' coffee breaks for anyone interested in taking part in the study. The information packs were considered by potential participants at home. The information pack contained a summary of the study, the Tinnitus Reaction Questionnaire, the study Potential Participation Contact Information and Confirmation of Eligibility sheet and a stamped envelope addressed to the researcher's University address, marked "Private and Confidential to be opened to by addressee only". Interested potential participants completed the Tinnitus Reaction Questionnaire and the Potential Participant Contact Information and Confirmation of Eligibility sheet. Completion of the documents required approximately twenty minutes of the potential participants' time. Potential participants were then required to post the documents to the researcher.

Following receipt by the researcher of the Tinnitus Reaction Questionnaire and the Potential Participation Contact Information and Confirmation of Eligibility sheet those individuals who were eligible for inclusion were sent a letter of invitation, the Participant Information Sheet and the Consent Form. No sooner than two weeks later, potential participants were contacted and, if they wished to participate, their interviews were arranged. Before the interview was started the Consent Form was signed. Copies of these documents are included in Appendices 10, 11, and 12.

The researcher contacted in writing those individuals who were not eligible for inclusion in the study as assessed by the tinnitus distress measure or those responders who would not be asked to participate after the sample size had been achieved. Their interest in participation and the time taken to undertake the screening process was acknowledged. It was also confirmed that their documentation and personal data would not be used in the study and that it would be destroyed according to University guidelines.

Between December 2015 and January 2016, sixteen study packs were collected by potential participants at the BTA support group meetings. Twelve potential participants returned the completed Tinnitus Reaction Questionnaire and Potential Participant Contact Information and Confirmation of Eligibility sheet. Three responders were ineligible to participate in the study due to their Tinnitus Reaction Questionnaire scores which were less than 17 indicating that they were not distressed by their tinnitus. The first six potential participants identified as eligible were invited to participate in the study. Three subsequent responders were excluded as the sample size had been achieved. From January 2016 to

February 2016, six participants were subsequently interviewed. Two were males and four were females. Their Tinnitus Reaction Questionnaire scores ranged from 21 to 64.

All participants' names and identifying data were changed to ensure anonymity following transcription of the interviews. The Participant Information Sheet, which is presented in Appendix 10, explains the methods of study data storage and disposal. The risk assessment and lone interviewing guidelines, advocated by the University which sponsored the study, were followed.

4.10 Interview process

The interviews were arranged with participants at a mutually agreed date and time and took place in the participants' homes. Each lasted between forty-five minutes and one hour and thirty minutes. Before beginning the interview, a brief outline of the purpose of the interview was provided. Participants were informed that their names and all references made to others and specific locations would remain anonymous. Participants were also told that the interviews would be audio-recorded, subject to their approval. The format of the interview was then explained. The researcher would ask questions concerning the participant's experience of tinnitus, the interviewee should feel free to discuss any aspects of their experience of tinnitus, the interview would be paused or stopped at the participant's request and after the interview there would be an opportunity to discuss any issues that had arisen from the interview process. If the participant wished to proceed with the interview on this basis, the consent form was signed.

A semi-structured interview guide (see Appendix 13), was used to collect data. The interview guide was developed from the findings of the main study and the study's literature review which suggested that tinnitus distress could be explained by the theory of emotional processing. A semi-structured interview schedule was chosen to allow participants to describe their experiences of tinnitus and to reflect on what they considered to be important.

The interviews gave participants the opportunity to talk about their perceptions and experiences of tinnitus, their emotional reactions and coping styles relating to tinnitus. Further in-depth questioning explored their emotional behaviours in relation to the constructs identified in the main study. This included attempts to avoid and suppress negative emotional experiences, difficulties with emotional expression, difficulty identifying emotions and behavioural signs of unprocessed

emotion. All participants confirmed that they considered the interview a positive experience where they gained the opportunity to narrate their experience of tinnitus, express their thoughts and emotions concerning their tinnitus and to describe their experiences of tinnitus interventions. The latter also led them to share views concerning what support should be available for people who experience tinnitus distress.

The following section will explain the approach to the data analysis.

4.11 Analysis of the interviews

Given the wide range of methods of data analysis within the qualitative research paradigm the selection of the study's data analysis method was guided by both the research question and pragmatic factors relating to the scope and aim of the interviews. Thus, a thematic analysis approach was adopted which allows for the identification of themes and patterns of meaning in the context of interviews. Braun and Clarke (2006) developed a checklist for criteria for good thematic analysis which guided this study's thematic analysis approach. Braun and Clarke (2013) also provided a detailed description of the process of thematic analysis undertaken in this study and now described.

4.11.1 Transcription

The interviews were transcribed verbatim. The transcription notation system used recorded the identity of the speaker, non-verbal utterances and included punctuation to facilitate analysis. The transcripts were checked for accuracy with the supervisory team. The interviews were then anonymised by changing or removing any information that could identify the participant or anyone else they referred to. Complete anonymity for individual participants was important as other participants who attended the same tinnitus support groups or other members of the groups may read the study. The transcripts were then saved to a password protected file.

4.11.2 Reading and familiarisation

In order to become familiar with the contents of the interviews the transcripts were read and re-read several times. From this process, initial impressions and concepts of potential interest were recorded in note form on the transcripts.

Although the interviews were to an extent concept driven, by focussing on the exploration of the role of emotional processing in tinnitus distress, it was important at this stage not to allow this perspective to shape how the texts were critically analysed in order to understand and make sense of the participants' experiences of living with tinnitus. The notes informed the second phase of analysis, the process of coding, where the complete coding approach was undertaken which aimed to identify all instances of interest or relevance to answering the research question.

4.11.3 Coding

Each time a section of text was identified as relevant it was allocated a code which consisted of a descriptive word or phrase. Data-driven codes reflected the explicit content of participants' narratives such as 'Thoughts and feelings at tinnitus onset' and 'What I do to cope with tinnitus'. Researcher-driven codes were derived from the identification of the implicit meanings within the texts which were underpinned by the study's conceptual and theoretical framework such as 'Negative appraisal triggered emotional distress at tinnitus onset' and 'Avoidance behaviour'. Some of the sections of texts were coded in many ways. Multiple data and researcher-driven codes or a combination of both were allocated. For example, "When I hear my tinnitus I think 'oh this is awful' and then I make myself busy so I don't notice it" was coded by 'Emotional reaction to tinnitus', 'What I do to cope with tinnitus' and 'Avoidance behaviour'. Word documents were created where the codes were recorded, accompanied by the relevant interview extracts and interview location information.

The extracts were reviewed again to revise and verify the codes. Broader codes were then developed from overlapping initial codes such as 'Avoidance' from 'Keeping busy' and 'Distractions'. New word documents were created which recorded the revised codes, their instances in the texts and interview location information. When the coding was completed the next stage of analysis, pattern based analysis, was undertaken where the codes and coded extracts were examined in order to identify themes.

4.11.4 Searching for themes

The provisional themes were generated in various ways. If the codes were large, rich and complex enough they were "promoted" to a theme (Charmaz, 2006) for example 'Early experiences of tinnitus'. The development of themes was further

informed by the guidelines provided by Braun and Clarke (2013). First, was there a central organising concept that unified the excerpts? Second, could the boundaries of the theme be identified? Third, was there sufficient meaningful text to support the theme? Fourth, how did the potential theme relate to other provisional themes? Last, how did the theme contribute to the overall story of the analysis? A visual thematic map was then produced in order to explore the relationships between the codes and themes which informed the next phase of analysis, the review and revision of provisional themes.

4.11.5 Revision of provisional themes and definition of final themes

The aim of this phase was to verify that the provisional themes corresponded well with the coded extracts and transcripts and that they worked together to provide a rich description of the interviews. The provisional themes were shared with the supervisory team and as a result some themes were combined. The verification process was repeated to ensure that the final themes captured the meaning of the texts in relation to the research question. Definitions of the themes were then written in order to distil the essence and scope of the theme. The themes and examples of the coded texts which generated the themes are presented in Appendix 14.

4.12 Summary

This chapter has presented the study's methodology, research design and methods. The main study used a cross-sectional, survey-based design to examine the relationship between emotional processing deficits and tinnitus distress. The TRQ was used to measure tinnitus distress and the EPS-25 was used to measure emotional processing. Data were collected from forty-seven adult participants recruited from NHS Audiology Clinics. Descriptive statistics were computed for demographic data and EPS-25 and TRQ scores. Spearman's rho correlations were then used to explore the relationship between the total TRQ scores and the total EPS-25 scores and between the total TRQ scores and the EPS-25 subscale scores. Interviews were then conducted with a further sample of six people who experienced tinnitus distress. The interviews were recorded and the data generated were transcribed and subjected to thematic analysis. The process produced themes which informed the findings. The findings from the interviews are presented in chapter 6.

In the next chapter the results from factor analysis of the TRQ and analyses of the survey data are presented.

Chapter 5: Results

5.1 Introduction

This chapter will first, present the results of the factor analysis of the TRQ undertaken in this study - factor analysis of the TRQ has not hitherto been published. Second, the demographic data of the participants will be presented. Third, the results of the tests of associations between emotional processing and tinnitus distress and between emotional processing subscales and tinnitus distress will be presented. Fourth, two groups identified by their tinnitus distress scores will be compared with regard to demographic data, and emotional processing deficits. Last, the results of analyses which aimed to identify if there were significant factors amongst the demographic and EPS-25 data which could predict tinnitus distress are presented.

5.2 Factor analysis of the TRQ

In the previous chapter it was established that there are conflicting opinions with regard to the factors in the TRQ which has been described by the authors (Wilson *et al.*, 1991) as a scale which compromises four factors: general distress, interference, severity and avoidance, and a two factor measure of general distress and tinnitus avoidance. In order to test the utility of these dimensions for correlation with the EPS-25, the 26 items of the TRQ were subjected to factor analysis. The data were first assessed for suitability. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO), which tests if the items share common factors, was above 0.6 (.870) and the Bartlett's Test of Sphericity, which also tests for a relationship between the items, was significant (<.001), supporting the factorability of the correlation matrix. Principal components analysis revealed of the four components with an eigenvalue of 1 or more; one component explained 63% of the variance (see Table 5.1 below). Eigenvalues, percentages of variance explained and cumulative values percentages for factors of the 26 items of the TRQ are presented in Appendix 8. An inspection of the screeplot confirmed that only one component was above the elbow. This result was also confirmed by the Monte Carlo PCA for parallel analysis program. Overall, the results of the analysis supported the use of a single component and that the TRQ assesses a single dimension of tinnitus related distress rather than the two or four factors

proposed by the scale's authors. Whilst the single factor solution has been suggested by recent researchers (Baguley *et al.*, 2013), factor analysis of the TRQ had not been disseminated prior to this study.

Table 5.1 Total Eigenvalues, % of Variance and Cumulative % of the First Four Factors of the Tinnitus Reaction Questionnaire Items

Factor	Initial Eigenvalues			
	Total	% of Variance	Cumulative %	Total
1	16.399	63.073	63.073	16.399
2	1.585	6.097	69.170	1.585
3	1.524	5.863	75.034	1.524
4	1.096	4.198	79.232	1.092

5.3 Demographic and preliminary analyses

5.3.1 Demographic analyses

In the sample of forty- seven participants there were 28 males (60%) and 19 females (40%). The mean age was 58.5 (SD=15.4, (range 20-85 years). The mean duration of tinnitus in years was 8.2 (SD=12.4). Thirty -three participants were married (70.2 %), 5 participants were single (10.6%), 4 participants were widowed (8.5%), 3 participants were divorced (6.4%) and 2 participants (4.3%) had an unspecified relationship status.

5.3.2 Tests for normality

Normality plots and tests were undertaken to assess the distribution of the TRQ scores (see Appendix 7). Inspection of the histogram and the normal probability plot suggested a non-normal distribution. A positive skewness value (1.155) indicated an asymmetrical distribution with low value score clustering. The Kolmogorov-Smirnov statistic confirmed that the normality of the distribution of scores could not be assumed (p=.016). The results of the normality tests determined that in subsequent analyses of the TRQ median values are calculated. The median value of the total TRQ scores was therefore calculated [*Md* =22 (IQR: 5, 37)].

Inspection of the histogram and the normal probability plot produced for the total EPS-25 scores suggested a normal distribution. The Kolmogorov–Smirnov statistic allowed for the assumption of the normality of the distribution of scores (*p*=.200). The results of the normality tests determined that in subsequent analyses of the EPS-25 mean values of the EPS-25 and the EPS-25 subscales were calculated.

The mean value of the total EPS-25 scores was 3.01 (SD=1.82). The mean value of the EPS-25 subscale Suppression scores was 3.88 (SD=2.57), for Signs of Unprocessed Emotion the mean value was 3.14 (SD=2.19), for Controllability of Emotion the mean value was 2.67 (SD=1.78), for Avoidance the mean value was 3.02 (SD=2.19) and for Emotional Experience the mean value was 2.33 (SD=1.89). The mean values of the total EPS-25 and the EPS-25 subscales scores are presented in Table 5.2

Table 5.2 Means With Confidence Intervals (CIs) and Standard Deviations of the Total EPS-25 and the EPS-25 Subscales' Scores

Variable	Mean (M)	Standard Deviation (SD)	Confidence Intervals (95 %)	
Total EPS-25	3.01	1.82	2.47	3.45
Suppression	3.88	2.57	3.13	4.64
Signs of Unprocessed Emotion	3.14	2.19	2.50	3.78
Controllability of Emotion	2.67	1.78	2.14	3.19
Avoidance	3.02	2.19	2.37	3.66
Emotional Experience	2.33	1.89	1.77	2.88

5.3.3 The association between emotional processing and tinnitus distress

In order to initially explore the association between emotional processing and tinnitus distress scatterplots were created which provide visual representations of possible associations.

A positive relationship in which total TRQ scores increased with the total EPS-25 scores was observed by inspection of the scatterplot. In addition, positive relationships in which total TRQ scores increased with the total EPS-25 subscales' scores were also observed (see Figure 5.1 below).

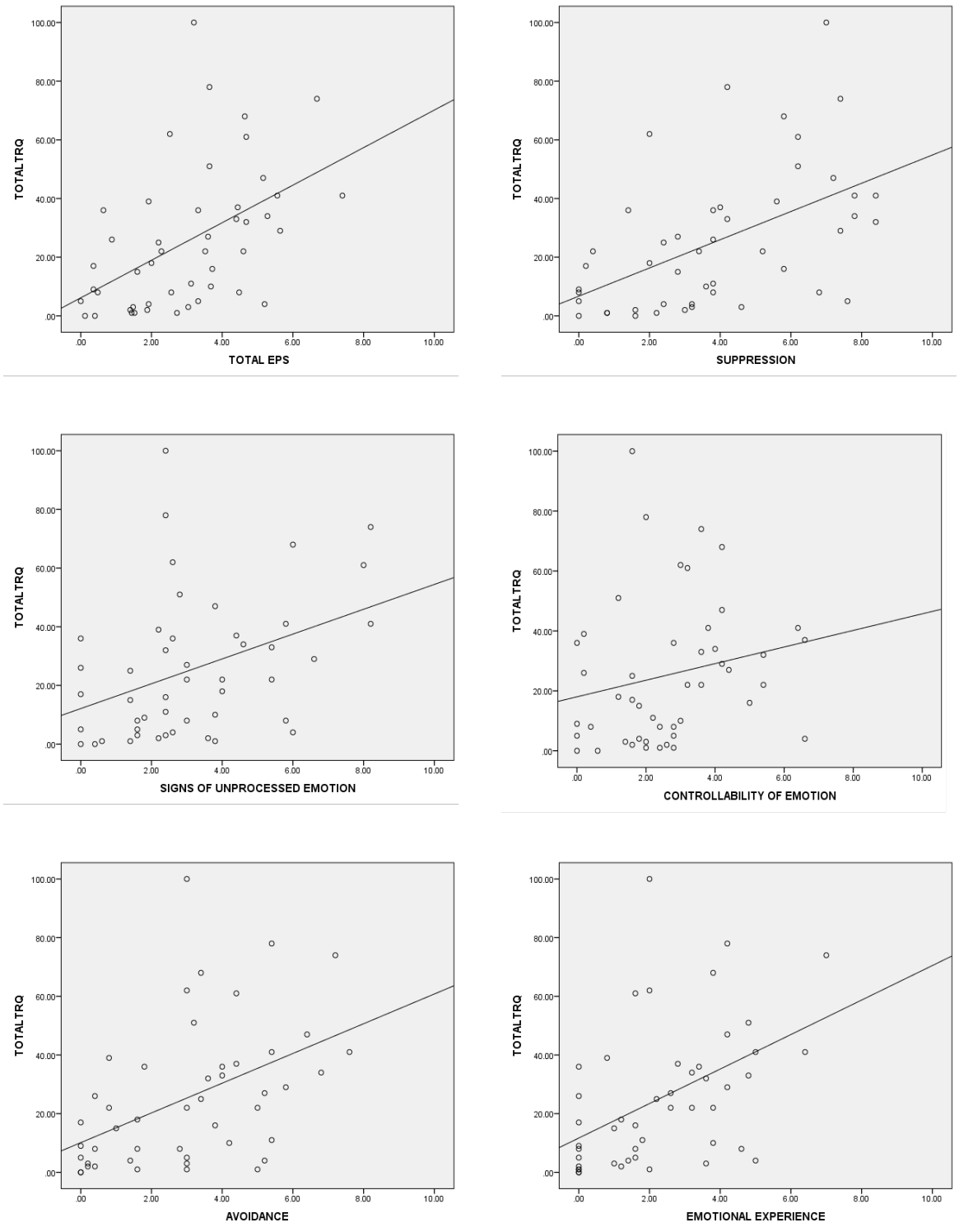

Figure 5.1 Scatterplots of the total TRQ scores and the total EPS-25 scores and the total TRQ scores and the total EPS-25 subscales' scores

Spearman's rho correlations were performed to test for an association between the total EPS-25 scores and the total TRQ scores. This revealed a strong positive correlation (r =.57, p<.001) which established that emotional processing problems were associated with tinnitus distress.

Spearman's rho correlations were then performed to test for correlation between the total TRQ scores and the EPS-25 subscales' scores. The strength of these relationships was categorised according to the criteria recommended by Dancey and Reidy (2004). Strong positive correlations were found between the total TRQ scores and the subscale Suppression (r= .57, p<.001), Avoidance (r=.54, p <.001) and Emotional Experience (r=.53, p<.001). Moderate positive correlations were found between the total TRQ scores and the subscales Signs of Unprocessed Emotion (r=.42, p=.003) and Controllability of Emotion (r=.33, p=.024). These analyses confirmed that greater scores of tinnitus distress were associated with an overall poorer emotional processing ability and that tinnitus distress was also found to be associated with the emotional processing deficits identified by the EPS-25 subscales. The results are presented in Table 5.3.

Table 5.3 Spearman's Rho Correlations between Total TRQ Scores and Total EPS-25 Scores and EPS-25 Subscales' Scores

Variable	Spearman's rho	p value
Total EPS-25	.57	<.001
Suppression	.58	<.001
Signs of Unprocessed Emotion	.43	.003
Controllability of Emotion	.33	.024
Avoidance	.54	<.001
Emotional Experience	.53	<.001

The relationship between the five EPS-25 subscales was investigated using Pearson product moment correlation coefficient. These analyses established high levels of associations between all EPS-25 subscales (see Table 5.4 below). The results are consistent with datasets presented by Baker et al. (2015b). This suggests that the subscales are not completely distinct entities but rather they

share common elements which, together, contribute to the overall construct of emotional processing.

Table 5.4 Intercorrelations for Subscales of the Emotional Processing Scale

Subscale	1	2	3	4	5
1. Suppression	—	.58	.51	.65	.69
2. Signs of Unprocessed Emotion	.58	—	.67	.70	.77
3. Controllability of Emotion	.51	.67	—	.71	.67
4. Avoidance	.65	.70	.71	—	.80
5. Emotional Experience	.69	.77	.67	.80	—

5.3.4 Summary of results

The association between emotional processing and tinnitus distress was established using the EPS-25 and the TRQ, a single factor measure of tinnitus distress as confirmed by factor analysis. Further analyses also established that tinnitus distress was associated with each of the five dimensions of emotional processing deficits measured by the EPS-25. There were also high levels of associations between each of the EPS-25 subscales, suggesting that they contain common elements which together, contribute to the overall construct of emotional processing.

Whilst the results have established that there is a relationship between problems of emotional processing and tinnitus distress, in order to provide data which has greater significance for clinical practice and the research agenda, further analyses were undertaken. In these, those participants who were distressed by their tinnitus were identified as a separate group from those who were not distressed in order to explore whether there were differences in the emotional processing styles between the groups. Differences in the demographic data of the groups were also analysed.

5.3.5 Identification of subgroups

According to the categorisation protocol recommended by the authors of the TRQ (Henry and Wilson, 1994), the following groups were identified. The participants were categorised as the non-tinnitus distress group (NTD) where their total TRQ score was in the range of 0-16. Participants were classified as being in the tinnitus distress group (TD) where their total TRQ score was in the range of 17-104.

5.3.6 Demographic analyses of the tinnitus distress group and the non- tinnitus distress group

The tinnitus distress group (TD) (n=25) comprised 15 males (60 %) and 10 females (40 %) with a median age of 58 years (IQR: 42.5, 64.5). The median duration of tinnitus was 3 years (IQR: .80, 7.5). Fourteen participants were married (56%), 4 were single (16%), 3 were widowed (12%), 2 were divorced (8%) and 2 participants had an unspecified relationship status (8%).

The non-tinnitus distress group (NTD) (n =22) included 13 males (59%) and 9 females (41%) with a median age of 60 years (IQR: 51, 74). The median duration of tinnitus was 2.5 years (IQR: 0.74, 21.25). Nineteen participants were married (86.5%), 1 was single (4.5%), 1 was widowed (4.5%), and 1 was divorced (4.5%).

A Chi-square test for independence (with Yates Continuity Correction) indicated no significant difference in gender ratio between the two groups, $\chi^2(1, n = 47) = .00$, $p = 1.00$, $phi = .009$. The Mann-Whitney U tests revealed no significant age differences between the two groups, [$U = 215.0$, z = -1.28, $p = .20$, $r = .18$] or duration of tinnitus differences [$U = 253$, z = -.47, $p = .64$, $r = -0.07$].

5.3.7 Emotional processing in the tinnitus distress group and the non-tinnitus distress group

The median TRQ score for the tinnitus distress group was 36.0 (IQR: 26.5, 56.0) and the median TRQ score for the non-tinnitus distress group was lower at 6.04 (IQR: 4.5, 17). The mean total EPS-25 score for the tinnitus distress group was 3.86 (SD=1.68) and the mean total EPS-25 score for the non-tinnitus distress group was lower at 2.04 (SD=1.48).

The mean scores for the total EPS-25 and EPS–25 subscales of the two groups are presented in Table 5.5

Table 5.5 Means with Standard Deviations of the Total EPS-25 Scores and EPS-25 Subscales' Scores with Mean Differences (MD), and Confidence Intervals (CIs) of Differences between the Tinnitus Distress Group (TD) and the Non-Tinnitus Distress Group (NTD)

	TD Group (n=25)		NTD Group (n=22)				
Variable	M	SD	M	SD	MD	95% CI	*p*
EPS-25 total	3.86	1.68	2.04	1.48	1.82	[.89, 2.76]	<.001
Suppression	5.00	2.37	2.63	2.22	2.36	[1.02, 3.71]	.001
Signs of Unprocessed Emotion	3.97	2.30	2.20	1.67	1.77	[.61, 2.94]	.005
Controllability of Emotion	3.18	1.83	2.08	1.56	1.10	[.11, 2.10]	.031
Avoidance	3.98	1.99	1.92	1.90	2.07	[.92, 3.21]	.001
Emotional Experience	3.18	1.76	1.37	1.58	1.80	[.82, 2.79]	.001

Independent *t* –tests confirmed that the tinnitus distress group scored significantly higher in the overall EPS-25 score [*t* (45) =3.95, *p* =<.001, effect size =.24]. The tinnitus distress group also scored significantly higher in the five EPS-25 subscales' scores- Suppression [*t* (45) = 3.53, *p* = .001, effect size =.217]: Signs of Unprocessed Emotion [*t* (45) = 3.04, *p* = .004, effect size =.170]; Avoidance [*t* (45) = 3.64, *p* =.001, effect size =.227], Controllability of Emotion subscale [*t* (45) = 2.23, *p* =.31, effect size = .099] and Emotional Experience (*t* (45) =3.70, *p* = .001, effect size = .233].

In order to identify if there were significant differences between the TD group and the NTD group at single-item level, their item scores in the five EPS-25 subscales were then examined and are presented in Appendix 9. In the Suppression subscale, the TD group mean scores were significantly greater than the NTD

group mean scores in all items. In the Signs of Unprocessed Emotion subscale, the TD group mean scores were significantly greater than the mean scores in the NTD group for three items and no significant differences were found in two items, item 12 "I tended to repeatedly experience the same emotion" [t (45) = .748, p = .459, effect size = .012] and item 22 "I kept thinking about the same emotion situation again and again" [t (45) = 1.87, p = .067, effect size = .073].

In the Controllability of Emotion subscale, no significant differences were found between the TD and the NTD group in four of the five items. In contrast, analysis of item 23 "It was hard for me to wind down" revealed significantly greater scores in the TD group than the NTD group [t (45) = 2.94, p = .005, effect size = .165]. In the Avoidance subscale, significantly greater scores were found in the TD group than the NTD group in four of the five items and no significant difference was found in item 14 "I tried to talk only about pleasant things" [t (45) = 1.42, p = .164, effect size = .043]. In the Emotional Experience subscale significantly greater scores were found in the TD group than the NTD group in four of the five items. No significant difference was found in item 20 "There seemed to be a big blank in my feelings" [t (45) = 1.81, p = .077, effect size = .068].

Overall, the results revealed that, out of three of the five subscales, the significant differences between the total mean scores in the TD group and the total mean scores in the NTD group were accounted for by three or more significantly greater mean item scores in the TD group. In the Controllability subscale, the difference between the total mean scores in the TD group and the NTD group was accounted for by a significantly greater score in a single item which relates to symptoms of hyperarousal. The implications of this finding from the Controllability subscale are discussed in Chapter 7.

In order to compare these results with healthy norms, the mean scores and standard deviations of the total EPS-25 scores and the EPS-25 subscales' scores for the TD group, the NTD group and from data collected from a healthy community study in the UK (Santonastaso, 2011) were examined (see Table 5.6 below). All data from the healthy community group examined were reported by Baker et al. (2015a). In some of the subscales the total mean scores for the TD group were significantly less than the healthy community group total mean scores which suggests that in some aspects of emotional processing the healthy norms have greater problems processing their emotions than people who report tinnitus distress. As these findings were unexpected, the individual differences in the item scores for these subscales in the TD group and the healthy community

group were then examined. Four of the five items mean scores in the Signs of Unprocessed Emotion subscale in the TD group were significantly greater than the healthy group items mean scores. In item 17, “I felt overwhelmed by my emotions” the mean item scores in the healthy community group were significantly greater than the TD group.

In the Controllability subscale, the TD group mean scores of three items were significantly greater than the healthy group items mean scores. Significantly greater mean scores in the healthy group than the TD group were found in two items, item 13, “I wanted to get even with someone” and in item 18, “I felt the urge to smash something”, which accounted for significantly greater mean subscale scores in the healthy community group than the TD group. These findings suggest that the experience powerful unregulated externally oriented emotions may not be indicative of poor emotional processing of the tinnitus stimulus. The implications of these findings are discussed in Chapter 7.

Table 5.6 Means with Standard Deviations of the Total EPS-25 Scores and Total EPS-25 Subscales' Scores of the Tinnitus Distress Group (TD), the Non-Tinnitus Distress Group (NTD) and Healthy UK Community Group

	TD Group (n=25)		NTD Group (n=22)		Health Community (UK) (n=1022)	
Variable	M	SD	M	SD	M	SD
EPS-25 total	3.9	1.7	2.0	1.5	3.7	1.5
Suppression	5.0	2.4	2.6	2.2	3.9	2.1
Signs of Unprocessed Emotion	4.0	2.3	2.2	1.7	4.5	2.1
Controllability of Emotion	3.2	1.8	2.1	1.6	3.5	1.9
Avoidance	4.0	2.0	1.9	1.9	3.4	1.7
Emotional Experience	3.2	1.8	1.4	1.6	2.9	1.7

5.3.8 Regression analysis

Multiple regression analysis was performed to assess the impact of a number of factors on the experience of tinnitus distress. The model contained four independent variables (total EPS-25 scores, age, gender and duration of tinnitus).

The selection of the variables of age and gender was guided by their potential clinical significance. The duration variable was included in order explore whether distress was associated with relatively recent tinnitus onset, in which case normal habituation to the experience of tinnitus had not been achieved. As shown in Table 5.7 only the total EPS-25 scores variable made a unique and statistically significant contribution to the model which suggests that greater tinnitus distress is associated with emotional processing problems and not with the age and gender of the participants and the duration of their tinnitus.

Table 5.7 Regression Analysis Summary for Variables Predicting Tinnitus Distress

Variable	B	95%CI	*P*
Total EPS-25 scores	.487	[2.75, 10.03]	.001
Age	-.116	[-.638, .227]	.431
Gender	-.032	[-14.76, 11.72]	.817
Duration of tinnitus	-.025	[-.621, .524]	.866

The variables of age, gender and duration of tinnitus were retained in the model and the independent contributions of the EPS-25 subscales were input to evaluate their ability to predict a significant amount of variance in tinnitus distress. The results indicated that the subscales of Suppression, Unprocessed Emotion, Avoidance and Emotional Experience made statistically significant unique contributions to the model and the age, gender of participants or the duration of their tinnitus variables were not associated with greater tinnitus distress. The Controllability subscale made no significant contribution to the model from the variables examined (see Table 5.8 below).

Table 5.8 Regression Analyses Summaries for the EPS-25 Subscales and Age, Gender and Duration of Tinnitus Variables Predicting Tinnitus Distress

Variable	B	95%CI	*P*
Total Suppression scores	.543	[2.51, 7.63]	<.001
Age	-.164	[-.704, .194]	.259
Gender	-.094	[-2.50, 7.63]	.488
Duration of tinnitus	-.008	[-.573, .541]	.954
Total Unprocessed scores	.373	[.919, 7.22]	.013
Age	-.075	[-.625, .599]	.364
Gender	.017	[13.11, 14.73]	.117
Duration of tinnitus	-.071	[-7.36, 4.63]	.649
Total Controllability scores	.179	[-1.79, 6.62]	.253
Age	-.071	[-.622, .401]	.665
Gender	-.001	[-14.91, 14.80]	.994
Duration of tinnitus	-.096	[-.829, .451]	.565
Total Avoidance scores	.457	[1.96, 8.02]	.002
Age	-.100	[-.618, .308]	.502
Gender	.108	[12.48, 14.21]	.131
Duration of tinnitus	-.053	[-.677, .473]	.723
Total Emotional experience scores	.463	[2.36, 9.34]	.002
Age	-.108	[-.630, .294]	.467
Gender	-.032	[-14.92, 11.83]	.817
Duration of tinnitus	-.072	[-.708, .431]	.625

5.4 Summary of findings

The aim of the present study was to investigate the concept of emotional processing in the context of tinnitus distress and to assess whether emotional processing deficits are greater in those individuals who are distressed by their tinnitus than those individuals who are not distressed, using correlational analyses. The results have provided data of significance for clinical practice and the research agenda by establishing that there were significant differences between styles of emotional processing in the tinnitus distress group and the non-tinnitus distress group. Moreover, from the variables examined, the total EPS-25 scores and the Suppression, Unprocessed Emotion, Avoidance and Emotional Experience EPS-25 subscales' scores variables were the only significant predictors of tinnitus distress. The Controllability subscale made no significant contribution to the model from the variables examined. Overall, the results have demonstrated that the participants who reported distress associated with tinnitus processed their emotions less effectively than those participants who were not distressed by their tinnitus.

Chapter 6: Findings from the interviews

6.1 Introduction

The aim of the interviews was to explore the role of emotional processing in the experience of tinnitus distress in order to complement the results of the main study, which together could inform clinical practice as well as indicate further areas for research. This chapter will first, introduce the participants in the second phase of the study. Second, the themes that were generated from the interviews will be presented. They are cognitive and emotional responses at tinnitus onset, the role of emotional processing in the experience of tinnitus distress and experiences relating to assessment, treatment interventions and perspectives on tinnitus therapy provision. Finally, the findings will be summarised.

6.2 Participants

A total of six interviews were conducted. The sample comprised four women and two men who experienced tinnitus distress as assessed by the Tinnitus Reaction Questionnaire. The duration of tinnitus ranged from eleven months to twenty-five years at the time of the interviews. All participants had received a diagnosis of tinnitus following medical consultation. Although two participants developed tinnitus after temporary ear disorders the onset of tinnitus was not a symptom of adverse medical conditions which could have been an explanatory factor for the experience of psychological distress. Some of the participants had undertaken NHS treatment for their tinnitus distress.

The names of the participants used in this section are pseudonyms.

Allan considered that at onset five years ago his tinnitus was unbearable; he feared for his future wellbeing and his sleep was disrupted. He was unable to use a nature sound generator provided by an audiologist due to his wife's dislike of ambient sound at night. He continued to experience sleep disturbance and undertook distraction activities at night until he could fall asleep. Allan felt that his tinnitus was an immoveable burden which he was unable to resolve.

Brian became aware of tinnitus twenty-five years ago. He felt he had been left uninformed and without guidance from his medical assessment.

During the day he avoided hearing his tinnitus by ensuring that there was constant ambient sound, keeping busy and by going out as much as possible. Brian experienced difficulty relaxing and intrusive thoughts when trying to sleep. While he trialled a range of sound generators he found that he was unable to tolerate external noise in the bedroom. He was reluctant to share the impact of his tinnitus with other people.

Carol was distressed at the onset of tinnitus five years ago and she felt let down when she was informed by her GP that no further treatment was available. She experienced intrusive thoughts at night and had problems sleeping. She became distressed when she was aware of her tinnitus during the day which led her to try to keep busy. Carol felt that tinnitus was “her problem” which she should not impose on others.

Diane was highly distressed and experienced panic at the loss of silence at the onset of tinnitus two and half years ago. The intervention provided by an audiologist to help her sleep was unsuccessful and, as no further support was offered, she was left with feelings of frustration and continued to experience severe sleep disturbance. Diane still panicked when her awareness of tinnitus was intensified in quiet places, and kept constantly busy to avoid her tinnitus from “crowding in”. She felt that other people could not understand how tinnitus takes over a person’s life and chose not to share her feelings.

Esme first became aware of tinnitus twenty years ago. After its onset, she experienced persistent feelings of distress, constantly asking herself what had caused it and why should such an upsetting condition have happened to her. Currently, she was distressed when she became aware of her tinnitus during the day at home and she sought to distract herself to avoid the perception of tinnitus and her feelings and thoughts about it. She continued to be troubled by the internal monologue experienced after its onset.

Faye experienced feelings of anxiety and panic at tinnitus onset eleven months ago. The loss of internal silence represented a significant threat as Faye needed to exert control in her life which was reflected by her intolerance to ambient sound at home and her tendency to suppress her emotions. Her distress led to severe sleep disturbance which subsequently affected her ability to work and her relationships. In the context of tinnitus therapy, she was able to talk about the impact of tinnitus on her emotional wellbeing, her sleep had improved and she was hopeful that she was moving forward to the resolution of her distress.

Following thematic analysis of the interviews, three themes were identified. The first theme concerned the participants' narratives relating to cognitive and emotional responses to the onset of tinnitus and its early impact on their lives. Such responses appeared to influence subsequent behaviours which were implicated in the generation and maintenance of tinnitus distress. The second theme concerned the role of emotional processing in their early and current experiences of tinnitus distress where the influence of schemas relating to emotional control, emotional experiences and emotional expression emerged as significant factors in the experience of symptom distress. Theme three concerned their clinical experiences, treatment and perspectives relating to the provision of therapeutic interventions. It appeared from the narratives that the participants' experiences of clinical assessments and treatment interventions may have reinforced their cognitive and emotional schemas. Further, it would seem that for some of the participants the clinical focus on the provision of technological solutions which did not address their emotional needs was unable to provide the context to facilitate emotional processing.

6.3 Cognitive and emotional responses at tinnitus onset

The first theme concerned the participants' cognitive and emotional responses to the onset of tinnitus and their perceptions of its early impact on their lives. From their accounts, the onset of tinnitus affected the participants' quality of life and behaviour in various ways ranging from experiencing symptoms of emotional distress, anxiety, panic, sleep disturbance and feelings of grief concerning loss of silence and sense of self.

For some participants the onset of tinnitus provoked very distressing thoughts and emotions which gave rise to fear for future coping. Living with constant intrusive internal noise was considered unbearable and constituted a threat to psychological wellbeing. For some participants these beliefs and their emotional distress resulted in significant sleep disturbance. The vivid descriptions and the highly emotive language used in the accounts suggested that the emotionally charged memory surrounding its onset may have continued to influence their appraisal of tinnitus as a threatening experience. Similarly, the participants' recollections of their early beliefs concerning the impact of tinnitus on their present and future psychological wellbeing captured the intensity of emotion associated with its appraisal. Overall, the participants' powerful descriptions of their early reactions encapsulate the components of the first stage of the EPM

where the emotional memory of the onset of a stimulus serves to reinforce its cognitive appraisal which together shape emotional responses to the stimulus.

Allan recalled his fearful reaction and how he believed he would not be able to cope with the noise in the longer term, as it represented a threat to his future emotional health:

> *It was driving me mad. I thought "I wouldn't be able to handle it if this carries on".*

Diane was devastated by the loss of silence; her sense of despair that she would have to live with tinnitus forever induced feelings of panic which were echoed by her current experience:

> *I think it was a total shock really, to find that it didn't go away. I just thought, "God I can't live with this I've lost silence". That's the only way I can describe it. I'm never going to have silence again" and so that was like a panic really.*

Faye described how her distress and subsequent sleep deprivation affected her ability to cope with the demands of daily living and her relationships with her family:

> *I was probably sleeping about three or four hours a night. It was very upsetting. I spent a lot of time crying. I just thought I'd never sleep again. It started to have a big impact on my work as I was less able to concentrate. I was so much less patient with my two teenage children.*

Overall, for many of the participants the onset of tinnitus represented an extremely distressing event. The descriptions revealed its profound impact on their psychological wellbeing, which was reflected by the fear that life would not be bearable if the noise continued. For some of the participants their early cognitive and emotional responses appeared to become embedded and were evidenced in the descriptions of their current experiences which suggested that the reappraisal of tinnitus as a benign stimulus may have been inhibited by their emotional processing styles.

6.4 The role of emotional processing in the experience of tinnitus distress

The second theme related to the exploration of the role of emotional processing in the experience of tinnitus distress. The narratives revealed attempts to avoid feelings triggered by the perception of tinnitus which appeared to be influenced by an avoidant attitude to the experience of negative emotions. Beliefs about the futility of sharing emotional concerns and the tendency to repress negative emotional experiences seemed to influence the suppression of tinnitus related feelings and expression of distressing emotions around tinnitus to others. The EPM identifies that such beliefs and attitudes, described as emotional schemas in the model, motivate emotional control behaviours of avoidance and suppression, which are conceptualised as unhealthy emotional processing styles. The narratives further suggested that restricted emotionality and ability to identify emotional experiences may have impacted on the capacity to recognise and engage with emotional responses to tinnitus. The presence of unprocessed emotion material, as conceptualised in the EPM, was also evidenced by the descriptions of persistent intrusive thoughts and feelings concerning the consequences of living with tinnitus and heightened arousal states.

The narratives concerning Brian's current and Faye's earlier experience of tinnitus identified communal themes; they both described childhood experiences relating to aspects of emotional control which were evidenced by avoidance of potentially emotionally charged situations, restricted emotionality, poor emotional awareness and non-expression of emotions. The EPM acknowledges that early emotional experiences may determine such behaviours. Both Brian and Faye's accounts suggest that their emotional processing styles, as conceptualised in the EPM, reflect the predisposition to experiential avoidance, poor emotional awareness and the suppression of emotional states and their expression. However, following the commencement of therapy Faye was able to understand that her need to exert emotional control may have been an important factor in the generation and maintenance of tinnitus distress. Further, she was able to describe and express her feelings surrounding tinnitus. In essence, this might explain why her highly anxious state after the onset of tinnitus, as described in the previous section, contrasted with her current belief that she will successfully adapt to living with tinnitus.

6.4.1 Avoidance

The narratives revealed that participants' emotional responses at tinnitus onset appeared to initiate early attempts to avoid exposure to such emotions and to their source, the perception of the tinnitus sound. For some of the participants avoidant attitudes towards the experience and expression of negative emotions seemed to influence early tinnitus avoidance behaviour. Further, from the descriptions of their current experience of tinnitus such avoidance behaviour had become embedded as a tinnitus coping strategy.

Tinnitus avoidance behaviours were characterised by constant effortful engagement in physical activities or mental distractions. Such actions appeared to be also motivated by attempts to avoid exposure to thoughts and feelings surrounding tinnitus. For some of the participants the unwillingness to engage in the experience or expression of negative emotions appeared to be shaped by the belief that exposure to situations that elicited negative emotions might compromise emotional control. These beliefs seemed to influence the avoidance of experiences which could intensify feelings surrounding tinnitus.

Carol described her distress when she was aware of her tinnitus and her attempts to avoid hearing it by distraction strategies:

> *I sit down and I think "Oh its driving me mad. Oh for goodness sake just shut up and go away, I can't do anything about it I've got do something" then I try and shut it out as much as I can. I do things like cleaning cupboards or just try to find something to do.*

Diane's earlier description of her feeling of panic at the loss of silence at the onset of tinnitus appeared to influence her current perception of tinnitus as a threat to wellbeing which was reflected by her constant attempts to avoid exposure to the sound and her emotional responses to it:

> *It has to be put in its place. I can't allow it to take over my life any more than it does. I can't give it room in my head to take over. And I think if you can push it to the back of your mind, it is not in your face. I try and shut it out as much as I can. I make myself busy. There's no good just sitting because then it crowds in.*

Faye explained that, as a child, she avoided the experience of negative emotions which appeared to influence her predisposition to avoid such experiences and their expression as an adult. Thus, in her early experience of tinnitus she avoided emotional triggers which may evoke distressing feelings surrounding tinnitus:

> *Since I was a very small child, my parents probably have never seen me upset. I never liked to show any negative emotions and I wouldn't watch something that will make me cry. I avoided things that could trigger negative feelings because it would make me think about my tinnitus and how I feel about it.*

The avoidance of potentially distressing circumstances which may increase tinnitus perception was echoed by Brian:

> *I try to avoid stressful situations in case it makes my tinnitus worse. So I try to avoid conflict if I can.*

Overall, the narratives revealed communal patterns of behaviour. These were early and current actions to avoid exposure to emotions surrounding tinnitus and the source of distress. The predisposition to evade scenarios which may provoke negative emotional responses also appeared to influence tinnitus related avoidance behaviours.

6.4.2 Emotional awareness and restricted emotional experiences

From the interviews with Brian and Faye it emerged that their emotional repertoires may have been influenced by emotional experiences in childhood. The internal experience of emotions, emotional awareness and willingness to engage with emotions are important for successful emotional processing. In contrast, difficulties with recognising, fully experiencing and remaining in contact with emotions are behaviours which impede the identification and expression of emotions and thus, the resolution of distress. It appeared that Brian and Faye's generalised lack of emotionality may have inhibited their ability to identify feelings and the strength of emotions relating to tinnitus. The EPM identifies poor emotional awareness and restricted emotionality as unhealthy emotional processing styles which inhibit the resolution of distress relating to a stimulus. This may explain why Faye was unable to process her emotional distress in the early months following tinnitus onset before tinnitus therapy provided the

context for the exploration of and engagement with her emotions surrounding tinnitus and for Brian's ongoing experience of tinnitus distress.

Brian described the influence of his family's emotional climate on his emotional expressivity which appeared to impact on his emotional repertoire as an adult. He explained his difficulty with identifying his feelings surrounding tinnitus:

> *I'm not one for showing my emotions. It was the way I was brought up. We were not a cuddly sort of family. It's difficult to say sometimes what I'm feeling. I don't think that tinnitus depresses me but it might do.*

Elaborating on her explanation that during childhood she felt unable to express negative emotions Faye then related how her restricted experience of emotions may have influenced her ability to understand her feelings relating to tinnitus earlier on following its onset:

> *I'm probably not a hugely emotional kind of person. I found it hard to identify what I was feeling. I probably didn't really know at times whether I was angry or upset or frustrated.*

The emotional processing style which relates to the disposition to poor emotional awareness and impoverished emotional experiences, as conceptualised in the EPM, did not emerge from other participants' narratives. However, it may be of importance given that Brian and Faye reported significantly greater levels of distress than other participants in the study's measure of tinnitus distress.

6.4.3 Suppression

The control of emotional experiences surrounding tinnitus was further evidenced by patterns of behaviour which indicated the tendency to emotional suppression. Participants described how they bottled up their feelings, tried not to show their feelings or felt unable to express their distress to others. It would seem that Brian and Faye's restricted emotional repertoires described earlier may have been influential on the internal suppression and expression of tinnitus related distressing emotions. Their narratives revealed Brian's belief concerning the

experience of negative emotions and Faye's need to exert control over the expression of her emotions.

Carol explained her belief that the personal burden of tinnitus should not be imposed on her family:

> *I don't talk to the family about it at all. I think to myself 'Well that's my problem, why should I put my problems on to them?'*

Diane explained the influence of childhood experiences on her current attitude relating to the experience of negative emotions and their expression. This appeared to impact on her belief that other people could not understand the constant emotional impact of living with tinnitus thus inhibiting her ability to share her distress. Her further comment suggested that she had to strive constantly to suppress such feelings:

> *My childhood was like you deal with things you had to survive if you were feeling unhappy about something there was no point spreading it about because the empathy wouldn't have been there. Positive feelings I'm happy with but if I feel fed up, unhappy or whatever I think just get on with it. I can't talk about tinnitus to friends because they don't know what it is like they don't understand. I don't talk even to my other half about it. You're the only person who knows how you feel. Unless you've got tinnitus you don't understand how it takes up so much of your time to keep it under control.*

Building on the earlier description of her restricted emotionality Faye explained how her attitude relating to emotional control influenced the suppression of her feelings and the expression of her distress during her early experience of tinnitus:

> *I rarely shared my feelings so I bottled up how I felt about tinnitus. I thought that moaning about it wasn't going to make it any better.*

Similarly, Brian explained how his perspective on the experience of negative emotions influenced the suppression of his emotions surrounding tinnitus:

> *I don't think getting upset about things helps at all so when it bothers me I try not to let it get to me as that wouldn't help at all.*

Overall, the narratives revealed that a number of participants adopted further consistent patterns of responses to distressing feelings surrounding tinnitus. Such behaviours appeared to be influenced by beliefs concerning the utility of negative emotional experiences and their expression and the dispositional tendency to suppress such emotions.

6.4.4 Signs of unprocessed emotion

The descriptions of early and current experiences suggested that the participants' emotional processing styles may have inhibited the resolution of tinnitus distress. The EPM identifies that the presence of unprocessed emotional material is evidenced by ongoing intrusive negative thoughts and feelings.

Esme explained how she was frequently preoccupied with distressing thoughts and feelings about tinnitus:

> *It draws your thoughts back to it, and then you go through that kind of "Why have I got it, why me, there's nothing I can do about it."*

In his description of his current experience Allan frequently expressed that tinnitus was a burden for him which reflected his narrative of the impact of tinnitus on his life at its onset:

> *You're lumbered with it. You are stuck with it you can't do anything about it.*

Overall, the descriptions in theme one of persistent distressing thoughts and feelings surrounding tinnitus, acknowledged symptoms of tinnitus distress, were further evidenced in their current experiences. Given that such symptoms are indicators of unprocessed emotional material suggested that the emotional processing styles explored in the current theme may have inhibited resolution of their distress.

6.4.5 Controllability of emotion

Some of the participants described ongoing symptoms of tinnitus distress which were heightened arousal, agitation and problems with relaxing. The EPM identifies such symptoms as behavioural aspects of unprocessed emotions.

Diane earlier described how she suppressed her emotional responses to tinnitus and she felt unable to share her distress with others. She expressed her current feelings of anxiety at the loss of silence which echoed her earlier heightened arousal in response to her distress at tinnitus onset:

> *The enjoyment of life has gone, because there's no silence. It's an outside intrusion that shouldn't be there which makes me panic.*

Given that Faye was enabled to identify and express her feelings surrounding tinnitus may have explained why her earlier emotional over-reactivity had resolved. However, she revealed that she experienced problems with relaxing which indicated that some unprocessed emotional material remained:

> *I was not as tolerant of things as I would normally be of things. I still can't sit down and read a book.*

Overall, the tendency to evade or suppress negative emotional experiences and their expression appeared to be associated with externally observable signs of the presence of unprocessed emotions around tinnitus.

6.5 Experiences relating to assessment, treatment interventions and perspectives on tinnitus therapy provision

While the main purpose of the interviews was to explore the role of emotional processing in tinnitus distress, during the narratives it emerged that the participants' clinical experiences may have been influential on beliefs concerning the experience and expression of emotions which shaped their emotional processing styles. Further, it would appear that where professionals delivered interventions driven by technological solutions participants' emotional experiences surrounding tinnitus were not explored and so the therapeutic context where emotional processing may be facilitated was not provided. Thus,

theme three concerned their clinical experiences, treatment interventions and their perspectives relating to the provision of tinnitus therapy.

6.5.1 Clinical assessment

The participants' experiences of clinical assessment appeared to reinforce beliefs concerning their future emotional wellbeing described in the first theme. Whilst the participants felt that the extent of their diagnostic assessment was appropriate the dominant perspective that tinnitus was not treatable may have served to embed the sense of helplessness, panic and despair experienced following tinnitus onset concerning future coping. Further, their clinical experiences may have reinforced attitudes to negative emotional experiences and their expression which influenced the emotional processing styles described in the second theme. For example, patterns of avoidance actions, internal suppression and non-expression of distressing feelings motivated by beliefs that other people could not empathise with their distress which emerged as responses to the onset of tinnitus may have been further consolidated by the negative outcomes of their consultations.

Diane explained to her doctor the impact of tinnitus on her wellbeing however, her emotional distress was not addressed. Given her belief concerning the utility of the expression of emotional distress described in the second theme, this may have acted to maintain her maladaptive coping behaviours:

> *The doctor just said "Oh it sounds like tinnitus you'll have to live with it. Then I was told there was nothing that could be done.*

When Faye was informed that there was no treatment for tinnitus this appeared to compound her anxious responses and may have served to reinforce schemas relating to avoidance of negative emotional experiences and their expression thus, intensifying her distress:

> *When they told me there was nothing they could do about it I think that was a big shock and I just thought I'd never sleep again!*

6.5.2 Treatment interventions

A number of participants were not referred for treatment following tinnitus onset. For those participants who were referred and trialled technical devices, which aimed to minimise tinnitus awareness, their interventions were ineffectual. In contrast, Faye, who was eventually referred for tinnitus therapy three months after diagnosis, described how she felt a sense of moving towards tinnitus acceptance.

Although it was explained to participants that sound therapy would help them to habituate to the experience of tinnitus, it appeared that interventions that solely focused on the provision of a range of ambient sound generating devices did not resolve their distress. A sense of frustration and regret that the devices were not successful emerged from the narratives which may have reinforced fears that their distress could not be diminished. This view seemed to be maintained by a lack of further support or interventions.

Diane hoped that the device provided would address her severe sleep disorder. However, a deep sense of frustration emerged concerning the delivery and ineffectiveness of her intervention. Given that there was no opportunity to explore further treatment options that would alleviate her anxious responses to tinnitus which impacted on her ability to sleep, her symptoms of distress continued:

> *I was given an in the ear white noise generator but there wasn't any follow-up about it, it was issued, and that was the end of it. I couldn't get it to turn down enough it was very frustrating that it didn't help me. My partner doesn't want any noise in the bedroom so I can't use a sound generator or a radio. So I won't go to bed until I get really, really tired then I crash out.*

In contrast, Faye's narrative revealed that her early anxiety in response to tinnitus was addressed in the context of tinnitus therapy where her emotional experiences surrounding tinnitus and its impact were explored and where she was enabled to identify and express her feelings. Further, it emerged that her anxious responses to tinnitus were influenced by her severe intolerance of ambient sound in her home which appeared to be shaped by schema relating to her generalised need to exert control in her life and dimensions of emotional control evidenced in theme two. Thus, Faye was able to adopt a more adaptive emotional processing style

and, together with the adjunct of sound therapy, this allowed her to modify her schema concerning the acceptability of internal and external sounds. Her distress then diminished and her sleep improved:

> *When I was doing it on my own, I didn't know what I was doing and because I was stressed and anxious about it so it made it worse. The tinnitus therapist really helped guide me, I got a chance to really explain the impact it's had on me, not just the noise, but yeah, the impact. I like to take control of stuff I always liked silence, so I couldn't cope with any noise in the house. She also gave me an in the ear white noise generator, which, since I've had it, I went from sleeping four hours a night to between six and seven hours. And it's made such a huge difference!*

6.5.3 Perspectives on tinnitus therapy provision

In view of their clinical and treatment experiences some of the participants shared their perspectives concerning the availability and delivery of tinnitus therapy. The aims of qualitative research include the exploration of participants' health concerns and their perceptions of the limitations of current services in order to inform future clinical practice which supports the inclusion of participants' opinions in this study. In addition, their views concur with the findings from the interviews. The early evaluation of the psychological impact of tinnitus and exploration of the person's emotional experiences around tinnitus and their expression may together serve to prevent the risk of persistent tinnitus distress. In light of the survey's findings and the further findings from the interviews, evaluation of emotional processing styles is warranted in order to guide therapeutic interventions.

In view of her treatment experience Diane identified that access to tinnitus therapy early after its onset would avert the development of persistent inescapable feelings of anxiety which appeared to echo her early and current experiences of tinnitus distress described in the first and second themes:

> *I think if there has been something there at the beginning a lot of people would not find themselves in a situation that could lead on to being really distressed and they can't cope it escalates and then you can't pull back.*

Esme considered that understanding of the constant detrimental effect of tinnitus on the person's emotional wellbeing, the impact of their distress on relationships and the context to express such distress were central to the therapeutic relationship:

> *You need the opportunity to sit and say to somebody "It's really getting to me". It's the fact that it's there with you 24/7 and you need to voice how it's affecting your life, it's very distressing and that affects people around you doesn't it? The kind of support that's needed is where they really understand the emotional side of tinnitus.*

In contrast, Faye reflected on her own experience of tinnitus therapy which enabled the exploration of the impact of tinnitus on her life and the expression of her emotional distress described earlier. Her narrative revealed a strong sense of change in beliefs concerning the consequences of living with tinnitus identified in theme one which suggested that its reappraisal may have been facilitated by the adoption of a more adaptive style of emotional processing. Further, her emergent cognitive and emotional schema may have been reinforced by the knowledge that, in contrast with the other participants, she had ongoing access to professional support within the context of a person-centred therapeutic relationship:

> *Tinnitus therapy has helped me feel positive and confident about it now. I can actually say that it is getting better and it can get better to the point when I hear it and it won't bother me at all and I do kind of accept it now. Talking about it to a professional with the skills to help me get to where I am now has made such a difference and the fact that it is ongoing is really reassuring.*

6.6 Summary

A total of six interviews were conducted which aimed to explore the role of emotional processing in the experience of tinnitus distress in order to complement the results of the main study, which together could inform clinical practice as well as indicate further areas for research.

Following thematic analysis of the interviews three themes were identified. The first theme concerned early experiences of tinnitus following it onset where

significant distressing thoughts and emotions, anxiety states and sleep disturbance gave rise to fear for future coping and emotional wellbeing. Participants' narratives captured the intensity of emotion associated with appraisal of tinnitus as an intrusive, disturbing and inescapable experience which encapsulated the components of the first stage of the EPM where negative cognitive appraisal of a stimulus determines the emotional responses to the stimulus. Further, according to the EPM, the memory of the onset of the stimulus serves to reinforce its significance and emotional responses which were congruent with the emotionally laden descriptions relating to the early experiences of a number of participants.

The second theme concerned the exploration of the role of emotional processing in the experience of tinnitus distress. The narratives revealed the influence of attitudes relating to the control of emotional experiences and their expression, conceptualised in the EPM as unhealthy emotional processing styles, which appeared to restrict the experience and expression of tinnitus related emotions thereby inhibiting the resolution of tinnitus distress. For some of the participants their attitudes to avoidance of negative emotional experiences and their expression were shaped by childhood experiences. The narratives concerning Brian's current and Faye's earlier experience of tinnitus identified communal themes which reflected emotional processing styles relating to experiential avoidance, poor emotional awareness and control of emotional states and their expression. However, Faye's description of her current experience suggested that, following the commencement of tinnitus therapy, she had adopted a more adaptive emotional processing style which appeared to allow for reappraisal of tinnitus. In contrast, the presence of unprocessed emotion material, as conceptualised in the EPM, was evidenced by the persistent intrusive thoughts and feelings concerning the consequences of living with tinnitus and heightened arousal states described by the further participants.

The third theme related to the participants' narratives of their clinical experiences and treatment interventions. Overall, the predominant medical opinion that tinnitus was not treatable may have served to reinforce negative appraisals of the consequences of living with tinnitus on their future emotional wellbeing and influence behaviours relating to experiential avoidance and emotional suppression which are evidenced in the descriptions of their current experiences around tinnitus.

Treatment interventions which focused solely on the provision of sound therapy did not appear to allow for the engagement with and expression of negative emotional experiences surrounding tinnitus necessary for successful emotional processing. Some of the participants shared their views regarding access to tinnitus therapy and also how it enabled the process of adaptation to living with tinnitus.

Thematic analysis enabled the identification of patterns of behaviour which were consistent with the survey's findings, thus the findings from the interviews also addressed the aim of the study. In addition, the interviews have generated new knowledge in several ways. The predisposition to dimensions of emotional control, as conceptualised in the EPS-25's emotional processing styles, appeared to influence early and current tinnitus related emotional behaviour.

Overall the findings have provided important evidence which supports the results of the survey, that there is a relationship between emotional processing and tinnitus distress. Further, the findings from the interviews corroborate the applicability of the EPM as an explanatory framework for tinnitus distress. The EPM identifies that following the onset of a stimulus, negative cognitive appraisal elicits negative emotional responses to the stimulus. Behaviours relating to dimensions of emotional control, influenced by emotional schema or attitudes relating to the experience and expression of emotion, then inhibit emotional processing thus, distress is maintained.

In the next chapter the study's findings, integrating those from the survey and the interviews, and their contribution to existing knowledge will be discussed.

Chapter 7: Discussion

7.1 Introduction

This research study sought to determine the applicability of emotional processing to aid understanding of tinnitus distress. The aim was to investigate if tinnitus distress could be explained by patterns of emotional processing identified within the theoretical framework of the EPM. It was anticipated that the findings of the study could inform clinical practice as well as indicate further areas of research. The study used self-report measures of emotional processing and tinnitus distress to investigate the associations between these constructs in individuals who attended NHS tinnitus clinics. Additionally, a small number of interviews were conducted which explored the role of emotional processing in the generation and maintenance of tinnitus distress in another sample of people who reported tinnitus distress.

This chapter will first, discuss the findings from the study with reference to the components of the EPM and the EPS-25 and its factors demonstrating how the findings relate to existing literature and identifying new knowledge which may inform future clinical practice. Second, the implications of the EPM as a theoretical framework for tinnitus distress in light of existing models will be discussed. Further consideration of the implications of the findings with reference to current clinical practice and for future research will be presented in chapter 8.

7.2 The relationship between emotional processing and tinnitus distress

The aim of the study was to investigate if the experience of tinnitus distress could be explained by the patterns of emotional processing identified within the theoretical framework of the EPM. The findings established that there was a relationship between emotional processing and tinnitus distress. Correlational analysis on self-report measures of emotional processing and tinnitus distress revealed a significant positive association such that those participants showing higher levels of tinnitus distress also showed higher levels of emotional processing deficits. The findings from interviews which explored the role of emotional processing in a further sample of people who reported tinnitus distress supported the survey's findings. Interviews also concurred with other aspects of

the EPM not assessed by the EPS-25 which emerged as consistent patterns of responses to tinnitus including the role of negative cognitive appraisals and behaviours influenced by emotional schema.

Although no previous research has investigated the relationship between emotional processing and tinnitus distress, the findings are consistent with the wider literature where the relationship between emotional processing and persistent psychological distress has similarly been established (Foa and Kozak, 1986; Murray and Segal, 1994; Pennebaker, 1997; Baker *et al.*, 2004; Greenberg, 2004; Baker *et al.*, 2013). It is also consistent with research on health related problems which include distress, such as fibromyalgia and chronic pain, which has found that emotional processing deficits are associated with higher levels of distress (van Middendorp *et al.*, 2008; Geenen *et al.*, 2012; Horsham and Chung, 2013).

The present study's findings are consistent with the most recent model of tinnitus distress (McKenna *et al.*, 2014) which similarly implicates negative cognitive appraisal and emotional responses, avoidance actions and the predisposition to inhibit emotional expression in the generation and maintenance of tinnitus distress. However, in contrast to McKenna *et al.*'s model, the present study also finds that the tendency to suppress emotional experiences, lack of emotionality and poor emotional awareness may be further important contributory factors for tinnitus distress. Therefore, the evidence from this study indicates that an alternative model of tinnitus distress should be considered which includes components relating to dimensions of emotional control identified in the EPM.

The regression analysis revealed that age and gender of participants did not explain levels of tinnitus distress. Furthermore, the duration of tinnitus was not a significant contributory factor for tinnitus distress. The findings for duration indicate that levels of tinnitus distress cannot be accounted for by the recency of tinnitus onset or short term tinnitus where initial emotional and cognitive responses have not resolved through normal processes of habituation. The regression model does show that emotional processing identified by the components of the EPM and measured by the total EPS-25 scores and the Suppression, Unprocessed Emotion, Avoidance and Emotional Experience EPS-25 subscales' scores are significant unique contributors to the experience of tinnitus distress. The Controllability subscale scores variable made no significant contribution to the experience of tinnitus distress from the variables examined

which may be explained by the subscale's items which relate to the experience of powerful unregulated externally oriented emotions which were not found to be strong indicators of poor emotional processing in those individuals who report tinnitus distress. Overall, these findings suggest that if poor emotional processing ability is a predisposition to emotional distress then the EPS-25 may indicate people at risk of persistent tinnitus distress. The reports from the qualitative data suggest that these patterns of emotional processing predate the onset of tinnitus which is supportive of this deduction.

In addition to establishing the relationship between tinnitus distress and the total emotional processing score, the study further found that each of the EPS-25 subscales correlated with tinnitus distress. Furthermore, there were significant differences between the tinnitus distress group and the non-distress group for all of the EPS-25 subscales' scores. This suggests that the emotional processing styles conceptualised by the subscales capture patterns of emotional behaviour that might determine the generation and maintenance of tinnitus distress. This assertion is supported by the findings from the interviews where schemas relating to aspects of emotional control which inhibit emotional processing appeared to influence maladaptive emotional behaviours concerning tinnitus, thus impeding the resolution of tinnitus distress.

The findings from the EPS-25 subscales and the interviews, which identified the constructs conceptualised in subscales and components of the EPM, will now be discussed, demonstrating consistencies with the literature and identifying new knowledge generated by this study.

7.2.1 Avoidance

The Avoidance factor of the EPS-25 assesses experiential avoidance, behavioural attempts to avoid situations that could evoke distressing emotions, and avoidant attitudes towards the experience of negative emotions. Items in the subscale include 'tried hard to avoid things that might make me upset' and 'unable to tolerate unpleasant feelings'. Active engagement with emotions is considered necessary in order that psychological disruptions associated with an event or stimulus are resolved and, conversely, attempts to avoid emotional experiences inhibit emotional processing (Rachman, 1980).

As presented in chapter 5, the survey revealed that avoidance was correlated with high tinnitus distress. Mean avoidance scores of the tinnitus distress group (3.98)

were significantly greater than the non-tinnitus distress group (1.92), suggesting that the tendency to avoid the experience of aversive internal emotional events and to minimise exposure to the context in which such events will occur may motivate tinnitus related avoidance actions. These persistent patterns of behaviour then inhibit the resolution of distress. In the context of the EPM, avoidance behaviour is also considered a "pre-attempt" to manage or control emotions which restricts the experience and expression of emotions necessary for successful emotional processing. This interpretation is corroborated by the findings from the interviews where attitudes relating the experience of negative emotions and avoidance of situations which may trigger distressing feelings appeared to influence tinnitus related avoidance behaviour.

The cognitive behavioural model of tinnitus distress (McKenna *et al.*, 2014) identifies that, following negative cognitive appraisals and negative emotional responses, external and internal actions are taken to avoid these appraisals. The potential for cognitive reappraisal is then prevented by these avoidance actions and thus, distress is maintained. The model is partially consistent with the interview study's findings and the EPM where negative appraisals elicit distressing emotional reactions to the stimulus and avoidance behaviour. However, contrary to the overall study's findings, McKenna *et al.*' s model does not acknowledge the associations between the tendency to avoid aversive emotional events, avoidance of tinnitus related emotions and persistent distress which were identified in this study.

The study's findings are consistent with wider existing literature which has shown that experiential avoidance is strongly evidenced in the development and maintenance of psychological distress (Chawla and Ostafin, 2007) and persistent pain related distress (McCracken, 1998; Viane *et al.*, 2003). The construct of experiential avoidance identifies that short term relief of distress is achieved through avoidance of internal events and through behavioural attempts to minimise such events. However, these avoidant actions increase the potential that such behaviours will persist (Hayes *et al.*, 1996; Hayes *et al.*, 2004).

The study's findings concur with other tinnitus research which has identified that the unwillingness to be exposed to the experience of tinnitus (Croft *et al.*, 2013a) and attempts to avoid situations which, a person believes, will intensify the perception of tinnitus (Kleinstauber *et al.*, 2013) are associated with greater tinnitus distress. However, until now the existing literature has not explored the relationship between the generalised tendency to avoid distressing feelings and

tinnitus distress, established by the survey findings. Nor have the relationships between the predisposition to avoid negative emotions, tinnitus related experiential avoidance and tinnitus distress, as evidenced in the interview narratives, been previously established. The study, therefore, has introduced new understanding by establishing that the predisposition to experiential avoidance, as conceptualised in the EPM, is a significant contributory factor for tinnitus distress.

The EPM identifies avoidance behaviour as a "pre-attempt" to manage or control emotions which concurs with the interview findings. This suggests that it is important to assess the tendency to avoid exposure to internal and external aversive emotional events in order to identify those people at risk of developing maladaptive tinnitus related avoidance behaviour after tinnitus onset. In addition, its evaluation would inform therapeutic interventions for those people who report persistent tinnitus distress.

7.2.2 Emotional experience

The Emotional experience factor of the EPS-25 assessed impoverished emotional awareness and lack of emotionality. The subscale's items include 'emotions feel dull/blunt' and 'got feelings but unsure whether they were emotions'. Previous research has shown that in healthy development individuals are able to identify and describe their emotions which helps to understand them and link them to events. In contrast, emotional processing is inhibited by the failure to experience an emotion as a psychological whole (Rogers, 1961; Gendlin, 1996), and the inability to link emotional feelings with the situation that triggered them (Rogers, 1961; Conway and Bekerian, 1987).

Survey findings revealed that Emotional experience was correlated with high tinnitus distress. Mean Emotional experience scores of the tinnitus distress group (3.18) were significantly greater than the non-tinnitus distress group (1.37), suggesting that the restricted ability to recognise and fully experience emotions may impair the capacity to engage with emotional responses to tinnitus necessary for emotional processing. This impoverished emotional repertoire and the disconnect between the physiological experiences and emotional responses may increase the tendency to focus on the somatic sensation of tinnitus rather than the emotional experiences associated with it, thus inhibiting adaptive psychological responses to tinnitus i.e. emotional processing.

The findings from the interviews further suggested that the impoverished ability to identify emotional experiences appeared to influence the recognition of emotions around tinnitus. They revealed that poor emotional awareness may have been shaped by restricted emotionality attributed by participants to the lack of emotional expression within the family and the unwillingness to express negative emotions since childhood. These findings are consistent with the EPM, which identifies that schemas, patterns of emotional behaviour influenced by past experiences, are contributory factors for maladaptive emotional processing styles.

The study's findings resonate with the existing literature and the EPM which identifies that the predisposition to poor emotional awareness may determine the disassociation between physiological experiences and emotional responses (Lumley *et al.*, 2011; Di Tella *et al.*, 2017). Thus, the recognition of and engagement with distressing emotional experiences necessary for emotional processing is inhibited. In line with the interview findings, health research identifies restricted emotional awareness as a predictor for vulnerability to focus on and be fearful of somatic symptoms (White *et al.*, 2011). This behaviour, identified within the construct of anxiety sensitivity (Reiss and McNally, 1985), has been strongly associated with health related distress (Asmundson and Taylor, 1996; Zvolensky *et al.*, 2001).

Consistent with the study's findings, the cognitive-behavioural model (McKenna *et al.*, 2014) identifies sustained orientation to the tinnitus sound as a contributory factor for tinnitus distress where persistent attention may be attributable to hyperarousal associated with fearful responses to the noise. However, the model does not consider that difficulties in identifying emotions around tinnitus result in the tendency to focus on the somatic sensation rather than the emotions associated with it and thus, the potential for emotional engagement and expression is inhibited. In line with the study's findings, other research has identified the tendency to focus on and fear the tinnitus sensation as a factor influencing the distress caused by tinnitus (Andersson and Vretblad, 2000; Hesser and Andersson, 2009). However, until now the existing literature has not established relationships between tinnitus distress and poor emotional awareness, lack of emotionality, the disconnect between physiological and emotional experiences, fearful responses and sustained attention to tinnitus.

This study has, therefore, contributed new knowledge by identifying that the constructs presented in the Emotional experience subscale were significantly

associated with tinnitus distress. Further, the findings from the interviews extended the survey findings. Consistent with the EPM, emotional schemas were identified as contributory factors to restricted emotionality which appeared to influence the ability to recognise and engage with tinnitus related emotions.

The study's findings support the assessment of the person's ability to understand and engage with emotional experiences and the strength of emotionality to identify those people at risk of poor engagement with emotional experiences around tinnitus. In addition, its evaluation would inform the target of therapeutic interventions.

7.2.3 Suppression

The Suppression factor of the EPS-25 assessed control of emotional states, the expression of emotions and difficulty in expressing emotions. Items of the subscale include 'I smothered my feelings' and 'I kept quiet about my feelings'.

Survey findings revealed that suppression was correlated with high tinnitus distress. Mean suppression scores of the tinnitus distress group (5.00) were significantly greater than the non- tinnitus distress group (2.63) which indicates that the emotional processing style, reflected by the tendency to restrict emotional experiences and their expression, is a significant explanatory factor in the experience of tinnitus distress. Given these findings, it is proposed that the predisposition to suppress aversive emotional events may serve to intensify them which is reflected by persistent symptoms of tinnitus distress. This submission is supported by findings from the interviews where maladaptive schemas, attitudes relating to the experience of negative emotions and expression of emotional concerns, appeared to influence the control of emotional experiences and their expression associated with tinnitus.

Emotional expression is considered a natural physiological response and an important component of emotional processing (Greenberg and Safran, 1987; Pennebaker, 1995; Gross and John, 1998; Kennedy-Moore and Watson, 1999). Conversely, attempts to control, suppress or block emotional experiences are seen as barriers to emotional processing (Gendlin, 2003; Whelton, 2004; Greenberg, 2006). The study's findings concur with the existing literature in which internal control of emotional states has been identified within the construct of experiential avoidance as a significant predictor of persistent psychological

distress and of poor health outcomes (Denollet *et al.*, 2010) including adaptation to chronic pain (Geenen *et al.*, 2012).

interview findings resonate with the existing literature which identifies that the control of emotional states and their expression may be shaped by beliefs concerning the value and function of the experience of emotions and their expression and judgments on the acceptability of negative emotions (Campbell-Sills *et al.*, 2006).

In line with the study's findings, the predisposition to restrict emotional disclosure in social encounters has been identified as a contributory factor for tinnitus distress (Bartels *et al.*, 2010). Suppression of feelings around tinnitus has been associated with beliefs that others could not understand its emotional impact (Andersson and Edvinsson, 2008). However, until now the existing literature has not established the relationship between the tendency to internal suppression of emotional states and tinnitus distress.

As with the other components of the EPM, the study's findings around suppression are also consistent with the most recent model of tinnitus distress. In the context of their cognitive-behavioural model, McKenna *et al.* (2014) asserted that the tendency to restrict emotional expression to others may predict the vulnerability to tinnitus distress. However, this emotional schema was not included within the components of the model; the findings of the present study suggest that it should be.

This study's findings therefore indicate the importance of assessing control of emotional states and their expression in order to identify those people at risk of suppressing emotional experiences around tinnitus which, thereafter, would inform the target of therapeutic interventions.

7.2.4 Signs of unprocessed emotion

This factor of the EPS-25 assessed the presence of unprocessed emotion reflected by the experience of persistent intrusive distressing feelings. Items of the subscale include 'unwanted feelings keep intruding' and 'repeatedly experienced the same emotion'.

The survey findings revealed that Signs of unprocessed emotion was correlated with high tinnitus distress. Signs of unprocessed emotion mean scores from the tinnitus distress group (3.97) were significantly greater than the non-tinnitus

distress group (2.20), indicating that those participants who were distressed by their tinnitus experienced persistent symptoms of emotional distress which, according to Rachman's (1980) conceptualisation, are evidence of the predisposition to poor emotional processing. The survey findings were supported by the interviews where emotional responses after tinnitus onset were congruent with current descriptions of persistent distressing feelings around tinnitus. The study's findings are consistent with conceptualisation of the EPM as an interrelated system model where psychological processes which enhance or inhibit processing and the results of unsuccessful emotional processing are identified (Baker *et al.*, 2015a). Thus, the Avoidance, Emotional Experience and Suppression subscales represent predictive variables for poor emotional processing of the tinnitus stimulus and the Signs of Unprocessed Emotion subscale represents an outcome variable.

This interpretation is supported by the existing literature where emotional processing styles, as conceptualised in the EPM, have been identified as explanatory factors for persistent symptoms of emotional distress. For example, experiential avoidance and the predisposition to emotional suppression have been implicated in the experience of persistent negative emotions (Blackledge and Hayes, 2001; Gross and John, 2003). Poor emotional awareness has been identified as a predictor for generalised heightened negative emotional experiences (Lumley *et al.*, 2011).

This submission also concurs with research that established the tendency to restrict emotional disclosure in social encounters (Bartels *et al.*, 2010) and tinnitus avoidance behaviours (Croft *et al.*, 2013a) were associated with experience of persistent distressing tinnitus related emotions. While these aversive emotional events are acknowledged as symptoms of tinnitus distress, until now, it has not been established that they reflect the consequences of maladaptive emotional processing styles.

7.2.5 Controllability

The Controllability subscale assessed the presence of powerful externally orientated emotions involving high arousal, anger and agitation and the perception of the extent that they can be controlled. Items of the subscale include 'I reacted too much to what people said or did' and 'it was hard for me to wind down'. The items reflect Rachman's (2001) conceptualisation of further indicators of incomplete emotional processing.

Controllability was correlated with high tinnitus distress. Controllability mean scores of the tinnitus distress group (3.18) were significantly greater than the non-tinnitus distress group (2.08). Further analysis at item level revealed that the difference between the total mean scores in the TD group and the NTD group was accounted for by a significantly greater score in a single item which relates to symptoms of hyperarousal. Comparison of the TD group and healthy community group revealed greater mean scores in the healthy group than the TD group in two items, item 13, "I wanted to get even with someone" and item 18, "I felt the urge to smash something" which accounted for significantly greater mean Controllability subscale scores in the healthy community group than the TD group. Overall, these findings suggest that symptoms of hyperarousal are strong indicators of poor emotional processing of the tinnitus stimulus. In contrast, the experience of powerful unregulated externally oriented emotions are not necessarily indicative of poor emotional processing in those individuals who report tinnitus distress.

This suggests that when individuals lack emotional awareness, or tend to suppress or avoid their emotions, persistent emotional intrusions may elicit elevated physiological arousal. Arousal states then reinforce attention to somatic experiences including tinnitus which maintains their distress. This deduction is further supported by the interviews which revealed associations between maladaptive emotional processing styles and persistent symptoms of tinnitus related arousal.

The study's findings are consistent with the wider literature where elevated arousal is considered evidence of suppression of emotional states and their expression (Gross and Levenson, 1993, 1997; Moore *et al.*, 2008), the result of avoidance actions (Keltner *et al.*, 2013) or impoverished emotional awareness (Lumley *et al.*, 2007).

In line with the study's findings and the EPM, tinnitus research suggests that elevated arousal is generated by negative cognitive appraisal (Hallam *et al.*, 1984; McKenna *et al.*, 2014) and maladaptive emotional responses (Hallam *et al.*, 1984; Jastreboff, 1990; McKenna *et al.*, 2014), maintained by avoidance actions (Budd and Pugh, 1996) and associated with emotional suppression (Andersson and Edvinsson, 2008). While physiological arousal is acknowledged as a symptom of tinnitus distress (Hallam *et al.*, 1984; Wilson *et al.*, 1991), until now, it has not been established that it is an indicator of poor emotional processing styles.

7.3 Experiences relating to assessment, treatment interventions and perspectives on tinnitus therapy provision

The interviews revealed that participants' clinical and treatment experiences may have reinforced tinnitus related schemas, attitudes towards the experience and expression of distressing emotional experiences around tinnitus. These schemas appeared to be generated by their beliefs about the experience and expression of negative emotions which impacted on their emotional processing styles. Their experiences informed their reflections on the therapeutic needs of people who are distressed by their tinnitus. One of the aims of qualitative research is to explore participants' health concerns and their perceptions of the limitations of current services in order to inform future clinical practice. It was therefore considered important to include participants' opinions in this study.

The following section will discuss these experiences and participants' views within the context of the EPM.

7.3.1 Clinical assessment

The predominant medical opinion suggests that tinnitus is an untreatable condition and further, the emotional distress of people with tinnitus does not tend to be acknowledged during their clinical consultations. This appears to reinforce early negative appraisals concerning its impact on future psychological wellbeing and compound symptoms of distress. Emotional schemas which determine avoidance of expression of their emotional concerns, and beliefs that their expression is futile, seem to be further strengthened by their assessment. These patterns of behaviour and beliefs appear to impede expression of the emotional impact of tinnitus and, thus, emotional processing is inhibited. These findings support the importance of providing an empathic context where emotional experiences around tinnitus are acknowledged and addressed by accessing therapeutic interventions which evaluate the person's emotional processing style and explore their emotional schema.

7.3.2 Treatment interventions

Consistent with the EPM, interview narratives revealed that daytime behaviours involved avoidance of exposure to the perception of and emotional responses to

tinnitus, such as keeping busy. At the pre-sleep period, when these actions could not be undertaken, their emotional responses resurfaced which, together with elevated arousal states, impaired the ability to sleep. Therefore, most of the participants who sought treatment reported significant sleep disturbance as their primary symptom of tinnitus distress. Physiological arousal has been considered as a predictor of chronic sleep disorders associated with tinnitus distress (Miguel *et al.*, 2014). Harvey's (2002) model of insomnia proposed that persistent invasive distressing emotions and elevated arousal at the pre-sleep period are accounted for by incomplete emotional processing of daytime emotional material. This assertion is consistent with the components of the EPM and the interview findings. It appeared, however, for the majority of participants interviewed their interventions consisted of the provision of sound devices to decrease tinnitus awareness. Given that the evidence indicates that sound therapy without counselling offers no benefits to the alleviation of their distress (McKenna and Irwin, 2008) it was not surprising that their interventions were ineffective.

In contrast, for one participant sound therapy was an adjunct to the therapeutic process where the emotional impact of tinnitus was fully explored. The transition from the experience of severe symptoms of tinnitus distress to an emerging sense of acceptance appeared to be facilitated by the practitioner's skills and clinical experience which enabled the context for the activation of and engagement with emotions around tinnitus, thus initiating emotional processing. This finding supports the provision of emotion based therapy where the EPM provides the conceptual framework. However, further research is needed to establish efficacy.

7.3.3 Perspectives on tinnitus therapy provision

The participants' views, reflecting their experiences of clinical assessment, treatment interventions and tinnitus therapy, indicated the importance of emotional support. The evaluation of the psychological impact of tinnitus following onset was considered essential in order to prevent the risk of persistent symptoms of distress. The EPM identifies experiential avoidance as an early attempt to control emotional responses to a distressing stimulus which is consistent with the interview findings. Therefore, the clinical application of the EPS-25 following diagnosis could be used to identify those patients who require therapeutic interventions.

Further, the development of adaptive emotional processing styles and the sense of confidence in moving forward to acceptance, which emerged from the narrative of one participant, was attributed to ongoing professional support within the context of a person-centred therapeutic relationship. This finding indicates that the provision of an emotional processing based therapy programme would facilitate the acceptance of tinnitus as a benign experience.

7.4 The EPM as an explanatory framework for tinnitus distress

The study's findings support the applicability of the EPM as an explanatory framework for tinnitus distress. Informed by therapeutic and theoretical emotion-based literature, the model identifies the components involved in the initiation of emotional disturbance at the onset of a stimulus and how it is maintained. It further captures a range of dispositional styles which restrict emotional experiences, conceptualised in the EPS-25.

While the model is consistent with a number of the components of existing models of tinnitus distress, importantly, it identifies further explanatory variables for persistent symptom distress.

The EPM indicates that appraisal of the stimulus shapes the emotion experienced. This is congruent with the cognitive-behavioural model (McKenna *et al.*, 2014). The cognitive-behavioural model suggests that the predisposition to negative beliefs and emotions may predict vulnerability to tinnitus distress, which is consistent with the EPM. However, while the model identifies that beliefs about tinnitus are derived from general beliefs or cognitive schemas, in contrast to the EPM, the influence of emotional schemas on appraisal is not acknowledged. The neurophysiological model (Jastreboff, 1990) proposes that negative emotional responses to the sound are emotionally processed at a subconscious level. Thus, it does not identify the conscious psychological mechanisms involved in emotional processing.

In the context of the EPM, experiential avoidance of the stimulus that triggers a negative emotional response consists of verbal and behavioural strategies. This is congruent with acceptance based theory which considers that avoidance of the tinnitus sound and thoughts and feelings surrounding it reinforces its emotional significance and symptom related distress. While the EPM also indicates that

experiential avoidance is influenced by attitudes toward the experience of negative emotions, this is not acknowledged as a factor for persistent tinnitus distress in the acceptance based perspective of tinnitus distress.

In contrast, the cognitive-behavioural model (McKenna *et al.*, 2014) proposes that dysfunctional thinking, resulting from negative cognitive appraisal of the sound, motivates attempts to escape tinnitus related thoughts. These escape actions, the model considers, prevent reappraisal of underpinning cognitions and so emotional distress is maintained. Thus, the model does not acknowledge that attempts to avoid exposure to aversive emotional experiences around tinnitus are implicated in persistent symptom distress. Further, in the context of emotional processing, cognitive changes are an automatic consequence of the activation of emotions surrounding an adverse situation (Baker *et al.*, 2013).

The EPM identifies that the predisposition to poor emotional awareness and lack of emotionality inhibit engagement with emotions which is necessary for emotional processing of events or stimuli. However, existing models do not consider that restricted capacity to recognise emotions and diminution in the strength of emotional experiences may be explanatory factors for tinnitus distress. According to the EPM, the predisposition to control emotional states and their expression further impede emotional processing of the stimulus. While the cognitive-behavioural model (McKenna *et al.*, 2014) suggests that the tendency to restrict emotional disclosure in social encounters may predict the vulnerability to tinnitus distress, it is not included within the components of the model. Further, the model does not identify that susceptibility to suppress emotions is implicated in symptom distress.

Persistent aversive feelings around tinnitus, acknowledged symptoms of tinnitus distress, have been attributed by existing models to maladaptive cognitive, emotional and behavioural responses to the tinnitus sound (Hallam *et al.*, 1984; Jastreboff, 1990; McKenna *et al.*, 2014). The EPM indicates that these experiences reflect the presence of unprocessed emotional material resulting from unhealthy emotional processing styles. Similarly, heightened arousal, a further symptom of tinnitus distress, is also considered to be the result of emotional and cognitive responses to the noise. According to the EPM, hyperarousal is a further sign of the presence of powerful distressing emotions. This supports the premise that the EPM captures the psychological processes which enhance or inhibit processing and identifies the results of unsuccessful emotional processing (Baker *et al.*, 2015a).

The implications of the study's findings identified in this discussion will be developed in the following chapter.

Chapter 8: Conclusions, implications and recommendations

8.1 Introduction

In this chapter first, the study's findings, with reference to its aim, are summarised. Second, conclusions drawn from the findings and reflection on the research process are presented. Third, it will elaborate on the implications of the study' findings for clinical practice presented in chapter 7. Finally, this chapter concludes with recommendations for future research.

The aim of the study was to investigate if the experience of tinnitus distress could be explained by patterns of emotional processing identified within the theoretical framework of the EPM. The survey findings established that there was a relationship between emotional processing and tinnitus distress. The study further established that there were significant differences between all of the EPS-25 subscales' scores in the tinnitus distress group and the non-distress group which indicates that the emotional processing styles conceptualised by the subscales capture patterns of emotional behaviour that differ between those who experience distress and those who do not. Interpreted within the context of the EPM, this suggests that emotional processing deficits may determine the generation and maintenance of tinnitus distress.

The findings from interviews supported the survey findings and also concur with the EPM where further variables involved in emotional processing such as negative cognitive appraisal and maladaptive emotional behaviours, influenced by emotional schema, emerged as consistent patterns of responses to the experience of tinnitus. The study's findings are in line with the EPM and the existing literature where negative cognitive appraisals and emotional responses and the constructs conceptualised in the EPS-25 subscales are implicated in psychological and symptom related distress.

8.2 Conclusions

The study's findings are consistent with theoretical perspectives and other research where negative appraisal, experiential avoidance and the tendency to restrict emotional expression motivated by emotional schema have been

implicated in the initiation and maintenance of tinnitus distress. However, previous studies and existing models have not identified the relationship between the further constructs conceptualised within the items of the EPS-25 subscales, such as poor emotional awareness, restricted emotionality and the tendency to control exposure to aversive emotional experiences, and tinnitus distress. Therefore, this study has contributed new knowledge which supports the applicability of the EPM as an explanatory conceptual framework for tinnitus distress and the introduction of the EPS-25 as a predictive measure for the development of tinnitus distress. The findings from the interviews further support the clinical application of the EPS-25 and the implementation of emotional processing based tinnitus therapy.

8.3 Reflection on the research process

Reflection on the research process enables the researcher to consider whether the choice of topic, study design and methodology were justified and the extent to which the study has met its aim. It further allows the researcher to analyse their role in the research process and to evaluate the potential impact of their research on clinical practice (Maltby *et al.*, 2014). In the following three sections these are considered in relation to my involvement in the process as a researcher, the measures used and the research design.

8.3.1 Personal position in the research

In this section, the rationale for the selection of the research topic will be presented which demonstrates the importance of the process of reflective practice for clinicians (Mann *et al.*, 2009) and how personal experiences and beliefs may contribute to professional practice and existing knowledge (Cokely and DePlacido, 2012).

My interest in this topic area has developed as a result of my personal experiences and observations based on clinical practice as a Tinnitus Therapist in the NHS. My early clinical observations indicated that there were differences in the way patients approached their emotional experiences concerning tinnitus. Some patients who experienced tinnitus distress were not able to readily identify their emotions relating to tinnitus or suppressed these feelings, while others tried to avoid engaging with them.

From a personal perspective, seven years into clinical practice, I first experienced tinnitus which is ongoing. I am able, like many other people, to listen to the sounds that I hear and not respond to their presence emotionally or behaviourally. My personal experience of tinnitus and patients' narratives inspired me to seek explanations for differences in emotional and behavioural responses to tinnitus which were partially addressed by the existing literature.

Over time, my clinical observations further indicated the person's approach to emotional experiences might play an important role in the development and maintenance of tinnitus distress. These observations, together with my own experience of tinnitus and my personal perspective that engagement with and expression of distressing emotions elicited by life events is beneficial to psychological wellbeing, led me to seek an explanatory emotion based model for tinnitus distress. Thus, I undertook a literature search beyond the context of tinnitus research. Within the domain of psychology, the theory of emotional processing (Rachman, 1980) and the Emotional Processing Model (EPM) (Baker, 2001) were identified as explanatory conceptual perspectives for my personal experiences and clinical observations.

In view of my clinical background, I was initially drawn towards the exploration of emotional processing styles in the context of narrative interviews. However, I considered that a quantitative study was necessary in order to establish the applicability of the EPM as an explanatory framework for tinnitus distress. This decision was validated by the survey study findings which then informed the aim of the interview study where my personal and professional positionalities enabled patterns of emotional behaviours to be identified. Thus, reflection in action (Schon, 1983), in the context of clinical practice and during my research journey, allowed for the generation of theory-led knowledge and subsequent confirmatory evidence, supporting the personal and professional perspectives which informed the research topic.

Whilst I am not a professionally trained interviewer, I consider that my clinical experience contributed to my interviewing skills. I was able to develop a rapport with the participants and demonstrate a shared understanding of the clinical experiences and terminology relating to tinnitus distress and its treatment interventions which was reflected by the fluidity and transparency of the narratives.

All interview participants confirmed that they valued the opportunity to narrate their experience of living with tinnitus in a confidential, non-judgemental context. Thus, from a clinical perspective and with regard to the study's focus, the interviews provided the context for engagement with and expression of their distress surrounding tinnitus, thus promoting emotional processing. However, it was important to remain in the role of researcher throughout our conversation and, therefore, I did not allude to the potential therapeutic benefits of the interviews.

8.3.2 Research measures

The EPM and the measurement of emotional processing by means of the Emotional Processing Scale (EPS) (Baker *et al.*, 2007) provided the conceptual framework for the study from its outset and its final version, the EPS-25, (Baker *et al.*, 2010) was used in the study. The EPS was developed to identify, quantify and differentiate different types of emotional processing styles in individuals with psychological and physical disorders. The EPS-25 has been shown to have good internal consistency (Cronbach's α=.92) and test-retest reliability (r=0.74) (Baker *et al.*, 2010). The selection of the EPS-25 to assess emotional processing in the study was therefore justified, given its purpose and psychometric properties.

The selection of the Tinnitus Reaction Questionnaire (TRQ) (Wilson *et al.*, 1991) was determined by its ability to assess psychological distress associated with tinnitus and to distinguish between those who are distressed by their tinnitus and those people who are not distressed. This classification enabled the identification of the two groups whereby their TRQ scores could be correlated with their total EPS-25 and EPS-25 subscales' scores. Thus, this analysis allowed for the generation of evidence that there were different emotional processing styles in the two groups and that poor emotional processing styles were significantly associated with greater tinnitus distress.

The existing literature suggested that the TRQ is a measure of several dimensions of tinnitus distress. In view of the lack of consistency regarding the number and content of its factors this study sought to clarify the issue. The intention was, if it was established that it was a measure of more than one factor, its subscales would be correlated with the EPS-25 subscales. Given the results of the analysis, it was therefore prudent not to adopt the factors previously assumed. This study has therefore contributed new knowledge that can guide clinical assessment,

future tinnitus research and further investigations of the relationship between tinnitus distress and emotional processing.

8.3.3 Research design

In order to demonstrate research rigour by providing evidence of the overall research process and an audit of the recruitment process, I screened all referral letters to identify potential participants. I then recorded potential participants' names, dates of birth and hospital numbers. The screening process enabled me to ensure that those patients who did not fulfil the inclusion criteria (i.e. aged eighteen or above, able to communicate in English, and without a history of chronic physical or mental health conditions or ear disorders apart from tinnitus) were not invited to participate. The health and demographic questionnaire further identified those patients with a history of chronic physical or mental health conditions or ear disorders apart from tinnitus and ensured that their data were not included in analysis.

Clinical commitments, logistical problems and study and annual leave hampered my availability to undertake this process. Thus, the timescale of and procedure for recruitment had to be extended. Following ethical approval, patients referred to non-medical audiology clinics were included in the sampling strategy. On reflection, a wider sampling strategy from the outset of the study may have facilitated data collection. However, by extending the sampling strategy, this enhanced the generalisability of the study's findings to the overall adult tinnitus patient population.

The design of the survey study was influenced by the research governance policy of the NHS Trust where the study was conducted which required participants to give written consent in the presence of the researcher. Thus a postal survey approach was not feasible. Therefore, as a lone researcher, I needed to be available to meet potential participants during their clinic attendance where, if interest in participation was expressed, they were given the opportunity to read the Participation Information Sheet, to ask questions relating to the study and then to give written consent. Clinical commitments, study and annual leave and the introduction of peripatetic clinics impacted on my availability to undertake this process. However, this recruitment procedure may have contributed to high response rate obtained which enhanced the validity of the study's findings.

The data generated by the survey contributed new knowledge to the research agenda by establishing an association between emotional processing styles and tinnitus distress. However, the nature of the design, which examined the statistical relationship between a set of variables, precluded the exploration of a deeper understanding of the roles of emotional processing styles and the components of the Emotional Processing Model in the generation and maintenance of tinnitus distress which are not assessed by the Emotional Processing Scale. This gap prompted the conduct of a modest complementary qualitative study with a small sample of people who experienced tinnitus distress. Given that quantitative and qualitative research are complementary parts of a systematic search for knowledge (Silverman, 2013), a major strength of the research was the use of a survey and interviews: the additional use of qualitative research to supplement the quantitative data has the potential to increase the validity of the study's findings to generate insightful data which together, can inform future research and treatment interventions (Portney and Watkins, 2009).

Although the role of qualitative research in the enhancement of clinical practice and professional education is acknowledged (Yardley, 2000), until now, little research attention has been given to the exploration of experiences of people with tinnitus distress (Andersson and Edvinsson, 2008). Interview narratives are able to capture the perspectives of participants' experiences (Braun and Clarke, 2013) and the concerns of individuals who live with challenges to wellbeing, thus, bridging the gap between knowledge gained from quantitative studies and clinical practice (Sools *et al*., 2015).

In the recruitment procedure for the interviews, the exclusion criterion of those people who had previously undertaken treatment for tinnitus with me was imposed in order to ensure the autonomy of the participants' narratives. The decision to recruit from two tinnitus support groups was therefore justified given that this exclusion criterion reduced the number of potential participants. Collection of data from different people in the survey from those who participated in the interviews was a factor to take into account. However, that the results of the survey were supported by the findings from the interviews corroborates the validity of the study' findings and the applicability of the EPM as an explanatory framework for tinnitus distress.

8.4 Implications for clinical practice

The study's findings have a range of implications for clinical practice. The EPM represents a diagrammatic clinical tool to aid understanding of the role of emotional processing in tinnitus distress. It depicts the event that requires processing, i.e. the experience of tinnitus, the influence of negative cognitive appraisal and emotional schemas on negative emotional responses to tinnitus. It identifies how the tendency to avoid negative emotional experiences, poor emotional awareness and emotionality and suppression of emotional states and their expression inhibit the resolution of distressing feelings therefore, tinnitus distress is maintained. The EPS-25 gives the opportunity to identify people who may be more at risk of tinnitus distress. It is a multipurpose assessment tool which is able to assess risk of psychological disturbance associated with physical disorders, identify, quantify and differentiate different types of emotional processing styles in individuals with physical disorders and identify targets for interventions (Baker *et al.*, 2015a).

To date, there is no consensus on the protocol for tinnitus distress assessment (Baguley *et al.*, 2013). Self-report measures of patients' reactions to their tinnitus are used in the management of tinnitus patients (Meikle *et al.*, 2008). Whilst these measures are able to assess levels of distress and changes in distress post treatment they do not identify those patients at risk from persistent distress after its onset. The study's findings from regression analysis suggest that if poor emotional processing ability is a predisposition to emotional distress then the EPS-25 may indicate people at risk of persistent tinnitus distress. The reports from the qualitative data suggest that these patterns of emotional processing predate the onset of tinnitus which is supportive of this deduction. Together, these findings indicate that the use of the EPS-25 within the clinical assessment procedure would identify those patients who are vulnerable to poor emotional processing and, thus, flag up the need for early therapeutic interventions.

It is useful to consider how the use of the EPM and an associated therapy might improve on or support other approaches. Current approaches to therapeutic management, informed by a range of theoretical perspectives, aim to target maladaptive cognitive, emotional and physiological responses to tinnitus.

For example, Tinnitus Retraining Therapy (TRT) (Jastreboff and Hazell, 1993) aims to achieve habituation to tinnitus by 'directive counselling' which enables the patient to view it as a benign experience, thus reducing physiological arousal and

decreasing the negative reinforcement of the stimulus. However, there is little robust evidence regarding the efficacy of TRT (Phillips and McFerran, 2010). Given the study's findings that persistent elevated arousal is an indicator of unprocessed emotional material, the effectiveness of this treatment approach may be enhanced by the incorporation of therapeutic components which aim to enable engagement with and expression of emotional concerns about tinnitus.

Cognitive behaviour therapy (CBT) is the most widely used psychological intervention for tinnitus distress (Greimel and Kröner-Herwig, 2011). In CBT emphasis is placed on the modification of maladaptive cognitions rather than emotional behaviours to achieve tinnitus habituation. In the context of emotional processing therapy, Baker and colleagues (2013) propose that cognitive changes are considered an automatic consequence of the activation of emotions surrounding an adverse event or situation. The implication here is that by including an emotional processing component into CBT this would facilitate a more adaptive emotional processing style, thus promoting the potential for the reappraisal of tinnitus as a benign experience.

Acceptance and Commitment Therapy (ACT) and Mindfulness Based Cognitive Therapy aim to increase acceptance of the experience of tinnitus itself and associated distressing thoughts and emotions. The evidence suggests these treatment modalities are effective (Sadlier *et al.*, 2008; Westin *et al.*, 2011). However, the efficacy of individual components such as training to improve emotional awareness, thus enhancing emotional engagement, is not known. The use of the EPS-25 within these treatment modalities would identify the target for intervention and its effectiveness.

Overall, in view of study's findings, the introduction of the EPM and the EPS-25 within the context of these treatment approaches would provide an innovative explanatory framework for the psychological processes which inhibit the ability to accept tinnitus as a benign experience and for their assessment, thus informing the focus of therapeutic interventions. The introduction of the use of the EPS-25 pre and post- intervention within these treatment modalities would evaluate their effectiveness as it has been shown to be sensitive to change following therapy (Baker *et al.*, 2012).

Given the implications for clinical practice presented, informed by the emotional processing therapy protocol developed by Baker *et al.* (2013), it is useful to

consider what might be the key components of an emotional processing based tinnitus therapy programme. A protocol might involve five stages;

- the EPM provides the framework for the patient to understand the role of emotional processing in tinnitus distress, as described at the beginning of this section
- the EPS-25 identifies the person's emotional processing style and its relationship with their emotional behaviours surrounding tinnitus is explored. Exploration of the person's emotional schema enables understanding of their influence on their emotional processing style and emotional behaviours around tinnitus
- the results from the EPS-25 inform the therapeutic target
- delivery of therapy to enable emotional processing of the experience of tinnitus and, thus, resolution of distress.
- post-treatment administration of the EPS-25 to assess changes following therapy. Given that the Tinnitus Reaction Questionnaire (TRQ) (Wilson *et al.*, 1991) captures indicators of unprocessed emotional material around tinnitus, its use pre and post therapy allows for confirmation of the effectiveness of treatment.

The study's findings will be presented at conferences of the British Academy of Audiology (BAA) and the British Tinnitus Association (BTA), in order that its implications for future professional training and service delivery can be considered.

8.5 Recommendations for future research

Several areas for future research are indicated in order to extend the knowledge generated. This would include further exploration of the relationship between components identified in the EPM and tinnitus distress and the applicability of the EPM as an explanatory conceptual framework for the treatment of tinnitus distress.

Interview findings of this study indicated that early emotional experiences contributed to maladaptive emotional processing and tinnitus distress which is consistent with the EPM. However, further in depth exploration which focuses on these early experiences, attitudes and beliefs surrounding emotional experiences, emotional processing styles and tinnitus related emotional behaviours is warranted. This research could provide confirmatory evidence that emotional

processing styles might predict the generation and maintenance of tinnitus distress, thus supporting the use of EPS-25 in the assessment of tinnitus distress and the application of the EPM as a clinical tool to the context of therapeutic practice.

While the key components have been considered in this study, further research is needed to develop an emotional processing based tinnitus therapy programme. It is anticipated that its content would be informed by the Emotional Processing Therapy approach developed by Baker *et al. (2013)* and its development would involve collaboration between tinnitus therapists, psychologists, audiologists and service users. Within the context of this study, it is also expected that the clinical skills required to deliver the programme are identified. Thus, a project would be valuable to develop a clinical training programme. This would also facilitate the implementation of a further research recommendation, the evaluation of the therapy programme in a multi-site treatment based investigation which would establish its efficacy. Its effectiveness in comparison with other current tinnitus interventions, Tinnitus Retraining Therapy (TRT), Cognitive Behavioural Therapy (CBT), Acceptance and Commitment Therapy (ACT) and Mindfulness Based Cognitive Therapy, could then be determined.

In summary, the aim of the study was to investigate if the experience of tinnitus distress could be explained by emotional processing styles. The study has provided significant evidence to support the applicability of the EPM as an explanatory framework for tinnitus distress and, thus, generated new knowledge to inform future therapeutic interventions and the research agenda.

Appendices

A.1 Table of the databases used in the literature search process

Database	Description
Delphis	Delphis is a cross-searching tool that searches across the University of Southampton's library printed and electronic resources as well as major subject databases and indexes
CINAHL Plus With Full Text (Cumulative Index of Nursing and Allied Health Index)	CINAHL provides authoritative coverage of the literature related to midwifery, nursing, occupational therapy, physiotherapy, podiatry, health education and other related subject areas
EMBASE	EMBASE is a leading clinical medicine and biomedical database
MEDLINE	MEDLINE is the world's best-known medicine and clinical science database
PsycINFO	The key database for psychology and related subjects
Scopus	Scopus is the largest abstract and citation database of peer-reviewed literature: scientific journals, books and conference proceedings. It delivers a comprehensive overview of the world's research output in the fields of science, technology, medicine, social sciences, and arts and humanities

A.2 Example of the critical appraisal process outcome based on the CASP framework for critical appraisal of quantitative research

Study title: The Development of the Tinnitus Response Scales: factor analyses, subscale reliability and validity analyses Croft *et al*. (2013a)

Did the study address a clearly focussed issue? **Yes**	The development and validation of a self-report measure of tinnitus acceptance
Were the methods appropriate to address the research question? **Yes**	Data was collected from responses to the Tinnitus Response Scales developed in the study and validated measures of tinnitus distress and coping, illness perception and anxiety and depression from a sample of 551 participants
Were the participants recruited in an acceptable way? **Yes**	Participants were recruited via newspaper advertisements, radio and television interviews, notices placed in tinnitus newsletters and websites
Were potential confounding factors accounted for in the design and/or analyses? **No**	Chronic physical and mental health disorders were not identified as an exclusion criterion
What are the results?	The Tinnitus Response Scales is able to distinguish between adaptive and non-adaptive responses to tinnitus
How precise are the results?	Results from exploratory and confirmatory factor analyses and tests for reliability and validity were fully presented
Do you believe the results? **Yes**	
Can the results be generalised to the local population? **Yes**	
Do the results fit with other available evidence? **Yes**	

A.3 Survey study Participant Information Sheet

Participant Information Sheet Version 3.0 Date 6/6/10 Participant Identification Number

Tinnitus distress and emotional processing study

Susan McCormack

Audiology Department

Address

Dear ,

We would like to invite you to take part in our research study. Before you decide we would like you to understand why the research is being done and what it would involve for you. The researcher will go through the information sheet with you and answer any questions you have. We'd suggest this should take about 10 minutes and please ask us if there is anything that is not clear.

Part 1

What is the purpose of the study?

The study is being carried out as part of an educational qualification.

We are exploring people's reaction to their tinnitus and how they cope with it.

Why have I been invited?

We are asking adult patients with tinnitus who are attending the Audio- Vestibular Consultant Clinic over three months, which will be approximately 64 individuals, to participate.

Do I have to take part?

It is up to you to decide to join the study. We will describe the study and go through this information sheet. If you agree to take part, we will ask you to sign a consent

form. You are free to withdraw at any time, without giving a reason. This would not affect the standard of care you receive.

What will happen to me if I take part?

You will be asked to take home and complete a questionnaire booklet which contains a tinnitus questionnaire, an emotional coping questionnaire and a general information questionnaire which will take you approximately 30 minutes to complete and which will be returned by post in the envelope provided. You will not be required to attend any additional appointments and you will not incur any financial cost. We cannot promise that the study will help you but the information we get from this study will help us to improve the treatment we provide to people with tinnitus by understanding more about how tinnitus coping ability can be related to general emotional coping ability.

Any concerns, or complaints with regard to your participation in the study can be addressed by contacting the research team and the contact details are provided in Part 2.

Taking part in the study will be kept confidential. We will follow ethical and legal practice and all information about you will be handled in confidence. The details are included in Part 2.

If the information in Part 1 has interested you and you are considering participation, please read the additional information in Part 2 before making a decision.

Part 2

What if there is a problem?

If you experience any distress when completing the questionnaires, please telephone Miss Susan McCormack the Chief Researcher who is the Trust's Tinnitus Therapist.

Complaints

If you have any complaints, please contact the researcher by telephone or letter (details are provided at the top of this information sheet). If you remain unhappy and wish to complain formally, you can contact the Patient and Customer Services Team, Address and Telephone Number

If you do not wish to contact the NHS Trust concerning your complaint please contact the Independent Complaints Advocacy Service (ICAS) at Fairway House, Aldermaston Road, Basingstoke, Hampshire.RG24 9RH.Telephone number; 01256 376566.

All information which is collected about you for this research will be kept strictly confidential and will be retained for one year and then disposed of securely.

The information we collect from our research will be used to inform our treatment of tinnitus. The results will be published and presented to other research and clinical professionals but your information will remain anonymous. The researchers are not gaining any financial reward from including you in the study. All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee, to protect your interests.

Who has reviewed the study?

This study has been reviewed and given favourable opinion by Berkshire Research Ethics Committee.

A.4 Demographic, tinnitus and health questionnaire

Demographic, tinnitus and health questionnaire Version 1.0 Date 20/11/09

Tinnitus distress and emotional processing study

CONFIDENTIAL

Patient Identification Number.....

Today's date……..

1) Your age (in years).....
2) Your gender - please tick where applicable

   Male .....Female....
3) Your marital status - please tick where applicable

   Single.....Married.....Divorced.....Widowed.....

   Other.....
4) How long have you been aware of your tinnitus?.....

5) Do you have any major health problems? If so, please give more details.

6) Have you suffered from any mental health problems? If so, please give more details.

Thank you for providing this information which will be very helpful to our research

A.5 Survey study consent form

Consent Form Version 1.0 Date 20/11/09

Participant Identification Number……..

CONSENT FORM

Tinnitus distress and emotional processing study

CONFIDENTIAL

Researcher: Susan McCormack

Date

Please initial box

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information ask questions and have had these answered satisfactorily. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected. ☐

3. I agree to take part in the above study. ☐

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Name of patient	Date	Signature
.....	.....	.....
Name of Person taking consent	Date	Signature

1 copy for participant; 1 copy for researcher

A.6 The Tinnitus Reaction Questionnaire

The questionnaire is designed to find out what sort of effects tinnitus has on your lifestyle and general well-being. Some of the effects listed below may well apply to you, others may not. Please answer each question as you think it applied to you over the past week. Please ensure that you answer each question by circling the number that best reflects how your tinnitus has affected you over the past week.

1) My tinnitus has made me feel unhappy

0 1 2 3 4

not at all/ a little of the time/ some of the time/a good deal of the time/ almost all of the time

2) My tinnitus has made me feel tense

0 1 2 3 4

3) My tinnitus has made me feel irritable

0 1 2 3 4

4) My tinnitus has made me feel angry

0 1 2 3 4

5) My tinnitus has led me to cry

0 1 2 3 4

6) My tinnitus has led me to avoid quiet situations

0 1 2 3 4

7) My tinnitus has led me to feel less interested in going out

0 1 2 3 4

8) My tinnitus has led me to feel depressed

0 1 2 3 4

9) My tinnitus has led me to feel annoyed

0 1 2 3 4

10) My tinnitus has led me to feel confused

0 1 2 3 4

11) My tinnitus has “driven me crazy”

0 1 2 3 4

12) My tinnitus has interfered with my enjoyment of life

0 1 2 3 4

13) My tinnitus has made it hard for me to concentrate

0 1 2 3 4

14) My tinnitus has made it hard for me to relax

0 1 2 3 4

15) My tinnitus has made me feel distressed

0 1 2 3 4

16) My tinnitus makes me feel helpless

0 1 2 3 4

17) My tinnitus makes me frustrated with things

0 1 2 3 4

18) My tinnitus has interfered with my ability to work

0 1 2 3 4

19) My tinnitus has led me to despair

0 1 2 3 4

20) My tinnitus has led me to avoid noisy situations

0 1 2 3 4

21) My tinnitus has led me to avoid social situations

0 1 2 3 4

22) My tinnitus has made me feel hopeless about the future

0 1 2 3 4

23) My tinnitus has interfered with my sleep

0 1 2 3 4

24) My tinnitus has led me to think about suicide

0 1 2 3 4

25) My tinnitus has led me to feel panicky

0 1 2 3 4

26) My tinnitus has made me feel tormented

0 1 2 3 4

A.7 Normality plots and histograms

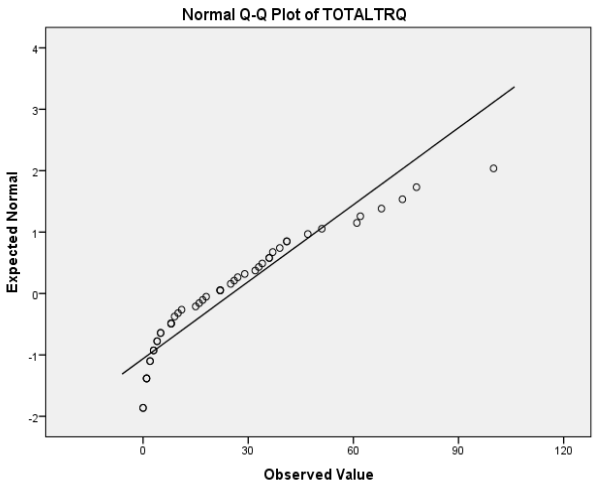

Figure 1 Normal Q-Q plot of total TRQ scores

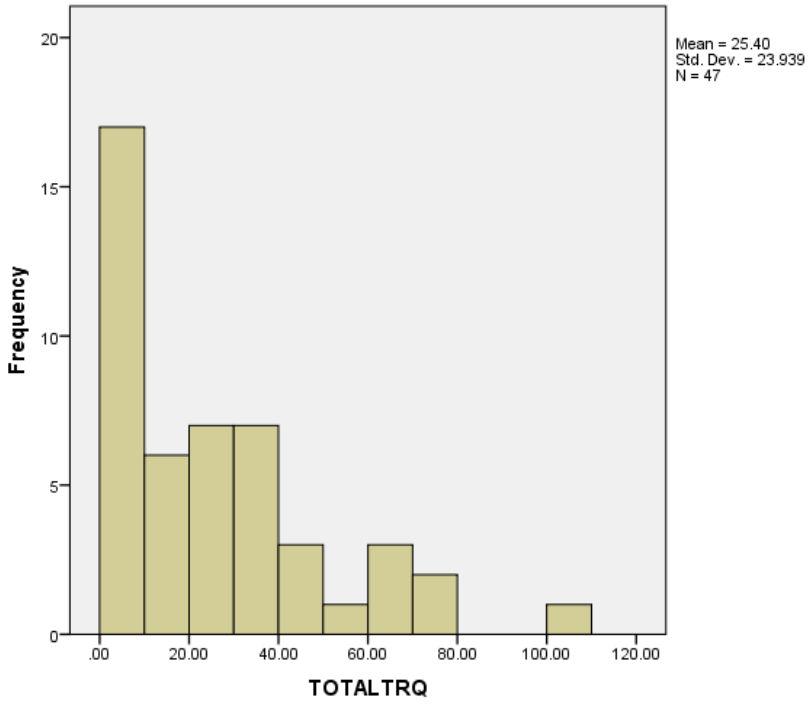

Figure 2 Histogram of total TRQ scores

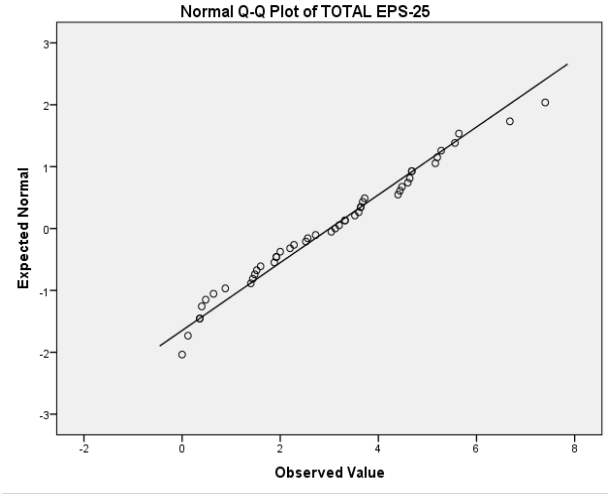

Figure 3 Normal Q-Q plot of total EPS scores

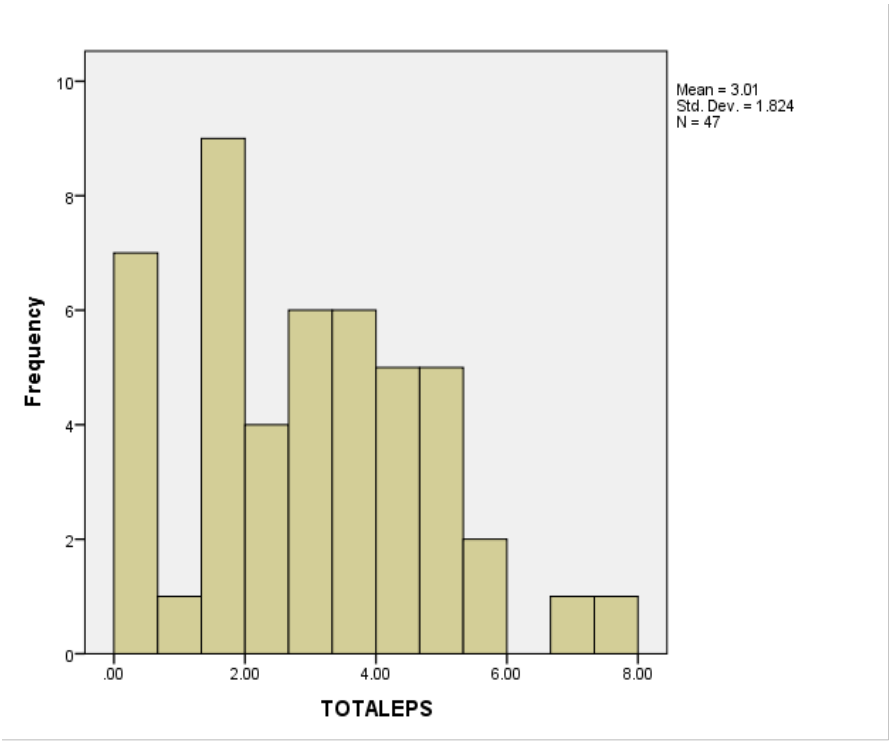

Figure 4 Histogram of total EPS scores

A.8 Table of Total Eigenvalues, % of Variance and Cumulative % of the Tinnitus Reaction Questionnaire Items

Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	16.399	63.073	63.073
2	1.585	6.097	69.170
3	1.524	5.863	75.034
4	1.092	4.198	79.232
5	.831	3.195	82.427
6	.686	2.640	85.067
7	.582	2.240	87.306
8	.535	2.056	89.363
9	.419	1.612	90.975
10	.383	1.474	92.449
11	.319	1.227	93.676
12	.268	1.029	94.705
13	.221	.851	95.555
14	.189	.726	96.281
15	.184	.708	96.990
16	.149	.572	97.562
17	.132	.509	98.071
18	.115	.441	98.512
19	.086	.331	98.843
20	.081	.312	99.155
21	.063	.243	99.399
22	.046	.175	99.574
23	.037	.141	99.715
24	.032	.124	99.839
25	.029	.113	99.953
26	.012	.047	100.000

A.9 Means with Standard Deviations of the EPS-25 Item Scores of the Tinnitus Distress Group (TD) and the Non-Tinnitus Distress Group (NTD)

	TD Group (n=25)		NTD Group (n-22)	
Variable	M	SD	M	SD
Suppression				
1	4.92	2.60	3.09	2.93
6	4.96	3.00	2.18	2.28
11	4.96	3.22	3.05	2.90
16	4.60	2.92	1.82	2.36
21	5.52	2.69	3.00	2.81
Unprocessed emotion				
2	4.16	2.91	1.86	1.98
7	4.40	3.18	1.55	1.79
12	4.12	2.68	3.50	3.00
17	2.88	2.65	1.36	2.01
22	4.28	2.89	2.77	2.56
Controllability of emotion				
3	3.84	3.11	2.55	2.40
8	4.16	2.66	3.09	2.74
13	1.72	2.01	1.55	2.48
18	1.04	1.46	0.50	1.26
23	5.16	3.13	2.73	2.45

Avoidance				
4	3.80	3.42	1.60	2.54
9	4.32	2.54	1.68	2.01
14	4.28	2.70	3.05	3.27
19	2.56	2.36	1.23	2.25
24	4.96	2.76	2.05	2.50
Emotional experience				
5	4.36	2.61	1.77	2.18
10	2.72	2.75	0.82	1.50
15	3.04	2.96	1.27	2.05
20	2.16	2.10	1.14	1.73
25	3.60	2.16	1.77	1.95

A.10 Interview study Participant Information Sheet

Study Title: An exploration of the emotional experiences associated with tinnitus distress: a qualitative study

Researcher: Susan McCormack **Ethics number**: 15253

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?

The aim of the study is to provide a detailed insight into the emotional experiences of individuals who have problems with coping with their tinnitus. I am inviting attendees at tinnitus support groups to participate in this research.

I am carrying out this study because I want to develop a better understanding of how certain patterns of emotional reactions to tinnitus could explain problems with coping with tinnitus. This study is part of a larger study which is being carried out as part of my Doctorate in Clinical Practice. I am funding this study which is sponsored by the University of Southampton.

Why have I been chosen?

You have expressed an interest in participating in this study and you have fulfilled the criteria for inclusion in the study: you experience distress associated with tinnitus and you are over 18 years of age, able to communicate in English, without a history of chronic physical or mental health conditions and ear-related disorders apart from tinnitus. You have also confirmed that you have not previously undertaken treatment for your tinnitus with me, Susan McCormack.

What will happen to me if I take part?

I will ask you to take part in a single individual interview with me to talk about your experiences of tinnitus, your emotional reactions to tinnitus and what you do to cope with your tinnitus. Before the interview takes place you will be asked to sign a consent form. The interview would be arranged at a mutually convenient time and would be conducted in your home and would last approximately one hour. The interview would be audio-recorded. A summary of the outcomes of the study will be available to the participants.

Are there any benefits in my taking part?

Although you would not benefit directly from taking part in the research, the results may help to inform clinical staff and researchers as to how we can best support individuals with psychological distress associated with tinnitus.

Are there any risks involved?

It is not anticipated that the interview will cause you emotional distress and you might find that the opportunity to discuss your experiences of tinnitus in a confidential setting to be a helpful process.

Will my participation be confidential?

All information relating to your participation will be kept strictly confidential. I will not tell anyone that you have taken part in the study. I may use things you have said during the interview in my report. However, I will not name you and all anonymised quotes will be carefully reviewed to make sure that you cannot be identified inadvertently. The anonymised research data will be stored securely at the University for ten years. All names and references to personal information that you make in the interview will remain anonymous in all presentations or publications of this research. The study complies with the University of Southampton's policy for the protection and storage of research information.

You will be assigned a unique coded identifier which will allow me to code the research data correctly. Your consent form will link your name with the code. These will be stored in a locked filing cabinet that only I can access. I will keep a list of everyone who has taken part in the study and their unique code in an electronic password protected file held on my computer. This list will be stored separately from the research data. The information which personally identifies you will be securely disposed of within three months of the study's completion.

What happens if I change my mind?

You are free to withdraw at any time without giving a reason. If you withdraw from the study, I will keep existing data confidentially. I will not refer to, or use any data collected about you or from you, in my research findings.

What happens if something goes wrong?

If you have any concerns about any aspect of this study, you should contact me and I will do my best to answer your questions. If you remain unhappy, particularly concerning the way you have been dealt with during the study, then you should contact the Research Governance Office, University of Southampton, Highfield, Southampton SO17 1BJ. Tel: 02380 595058. Their email address is rginfo@soton.ac.uk

Where can I get more information?

You can contact my Research Supervisors who will be able to answer any further questions that you may have about my study.

(Names, telephone numbers, email and postal addresses of Research Supervisors)

A.11 Participant contact information and eligibility for inclusion in the interview study form

Study Identification Number……. Ethics number 15253……

An exploration of the emotional experiences associated with tinnitus distress: a qualitative study

Your contact details

Title……..

First Name……..

Surname……

Address ……

…….Postcode……..

Telephone number(s)……..

Email address……

Please indicate below your preferred method of contact to arrange your interview if you are invited to participate in the study

……..

Confirmation of eligibility for inclusion in the study

Please read the following statement

I confirm that I am over 18 years of age, able to communicate in English, without a history of chronic physical or mental health conditions and ear-related disorders apart from tinnitus. I confirm that I have not previously undertaken treatment for tinnitus with the researcher.

Print name here……..

Your signature here……

Date……..

Please enclose this form with your completed tinnitus questionnaire in the stamped addressed envelope

A.12 Interview study consent form

Participant Identifier Number……

CONSENT FORM

Study title:

An exploration of the emotional experiences associated with tinnitus distress: a qualitative study

Researcher name: Susan McCormack

Study reference:

Ethics reference: 15253

Please initial the boxes if you agree with the statements:

I have read and understood the information sheet and I have had the opportunity to ask questions about the study.	☐
I agree to participate in the study, the audio recording of the interview and the use of my data for the purpose of this study.	☐
I understand my participation is voluntary and I may withdraw at any time without my legal rights being affected.	☐

Data Protection

I understand that information collected about me during my participation in this study will be stored on a password protected computer and that this information will only be used for the purpose of this study. All files containing any personal data will be made anonymous.

Name of participant (print name)……

Signature of participant……..

Date……

A.13 Interview study guide

An exploration of the emotional experiences associated with tinnitus distress

1) Could you describe to me please your experience of tinnitus, for example, when did you first notice your tinnitus and what were the circumstances surrounding the onset of your tinnitus?

2) Could you describe how you felt at the time of and following the onset of your tinnitus?

3) How did you react to it in other ways?

4) Could you explain how it affected you?

5) Did you talk to other people about how you felt then?

6) Can you describe anything you did then to cope with it?

7) Could you tell me about any treatment you had at the time or since then?

8) Could you describe your thoughts and feelings about your tinnitus now?

9) Could you tell me when you experience these thoughts and feelings how do you react?

10) Can you describe when you experience these thoughts and feelings what do you do that you think helps you?

11) How would you describe the impact of tinnitus on your life now?

12) What other sorts of things do you do now to cope with it?

13) Do you talk to other people about it now - to family or at the tinnitus group perhaps?

14) Could you tell me about your emotional experiences relating to your tinnitus that we have not covered?

15) How did you find this experience of talking about your tinnitus?

A.14 Table of themes and examples of the coding of interview transcripts

Themes	Coding and text
Emotional and cognitive responses at tinnitus onset	Early experiences/impact/thoughts and feelings I think it was a total shock really, to find that it didn't go away. I just thought, "God I can't live with this I've lost silence". That's the only way I can describe it. I'm never going to have silence again' and so that was like a panic really.
Emotional processing	Influences on emotional expression/reduced emotionality/ emotional awareness/impact on emotions around tinnitus I'm not one for showing my emotions. It was the way I was brought up. We were not a cuddly sort of family. It's difficult to say sometimes what I'm feeling. I don't think that tinnitus depresses me but it might do.
Experiences relating to assessment, treatment interventions and perspectives on tinnitus therapy provision	Experience and benefits of tinnitus therapy/acceptance/ change from early experience Tinnitus therapy has helped me feel positive and confident about it now. I can actually say that it is getting better and it can get better to the point when I hear it and it won't bother me at all and I do kind of accept it now. Talking about it to a professional with the skills to help me get to where I am now has made such a difference and the fact that it is ongoing is really reassuring.

List of References

Aaronson, N.K., Muller, M., Cohen, P.D., Essink-Bot, M.-L., Fekkes, M., Sanderman, R., Sprangers, M.A., Te Velde, A. and Verrips, E. (1998) Translation, validation, and norming of the Dutch language version of the SF-36 Health Survey in community and chronic disease populations. *Journal of Clinical Epidemiology,* 51 (11), 1055-1068.

Andersson, G. and Edvinsson, E. (2008) Mixed feelings about living with tinnitus: a qualitative study. *Audiological Medicine,* 6 (1), 48-54.

Andersson, G., Eriksson, J., Lundh, L.-G. and Lyttkens, L. (2000) Tinnitus and cognitive interference: a Stroop paradigm study. *Journal of Speech, Language, and Hearing Research,* 43 (5), 1168-1173.

Andersson, G., Stromgren, T., Strom, L. and Lyttkens, L. (2002) Randomized controlled trial of internet-based Cognitive Behavior Therapy for distress associated With tinnitus. *Psychosomatic Medicine* 64 (5), 810-816.

Andersson, G. and Vretblad, P. (2000) Anxiety sensitivity in patients with chronic tinnitus. *Scandinavian Journal of Behaviour Therapy,* 29 (2), 57-64.

Andersson, G., Vretblad, P., Larsen, H.C. and Lyttkens, L. (2001) Longitudinal follow-up of tinnitus complaints. *Archives of Otolaryngology–Head & Neck Surgery,* 127 (2), 175-179.

Appels, A., Höppener, P. and Mulder, P. (1987) A questionnaire to assess premonitory symptoms of myocardial infarction. *International Journal of Cardiology,* 17 (1), 15-24.

Arnold, M.B. (1960) *Emotion and Personality.* New York, NY: Columbia University Press.

Asendorpf, J.B. (1989) Shyness as a final common pathway for two different kinds of inhibition. *Journal of Personality and Social Psychology,* 57 (3), 481-492.

Asmundson, G.J. and Taylor, S. (1996) Role of anxiety sensitivity in pain-related fear and avoidance. *Journal of Behavioral Medicine,* 19 (6), 577-586.

Asmundson, G.J., Wright, K.D. and Hadjistavropoulos, H.D. (2000) Anxiety sensitivity and disabling chronic health conditions. *Scandanavian Journal of Behaviour Therapy,* 29 (3-4), 100-117.

Austenfeld, J.L. and Stanton, A.L. (2004) Coping through emotional approach: a new look at emotion, coping, and health-related outcomes. *Journal of Personality,* 72 (6), 1335-1363.

Aveyard, H. (2014) *Doing a Literature Review in Health and Social Care: A Practical Guide* 3rd ed. England: Open University Press.

Axelsson, A. and Ringdahl, A. (1989) Tinnitus - A study of its prevalence and characteristics. *British Journal of Audiology,* 23 (1), 53-62.

Bagby, R.M., Parker, J.D. and Taylor, G.J. (1994) The twenty-item Toronto Alexithymia Scale—I. Item selection and cross-validation of the factor structure. *Journal of Psychosomatic Research,* 38 (1), 23-32.

Baguley, D., Andersson, G., Mcferran, D. and McKenna, L. (2013) *Tinnitus : A Multidisciplinary Approach*, 2nd ed. Chichester, UK: Wiley.

List of References

Baker, R. (2001) An emotional processing model for counselling and psychotherapy: a way forward? *Counselling in Practice,* 7 (1), 8 - 11.

Baker, R., Gale, L., Abbey, G. and Thomas, S. (2013) Emotional Processing Therapy for post traumatic stress disorder. *Counselling Psychology Quarterly,* 26 (3-4), 362-385.

Baker, R., Holloway, J., Thomas, P.W., Thomas, S. and Owens, M. (2004) Emotional processing and panic. *Behaviour Research and Therapy,* 42 (11), 1271-1287.

Baker, R., Owens, M., Thomas, S., Whittlesea, A., Abbey, G., Gower, P., Tosunlar, L., Corrigan, E. and Thomas, P.W. (2012) Does CBT facilitate emotional processing? *Behavioural and Cognitive Psychotherapy,* 40 (1), 19-37.

Baker, R., Thomas, P., Thomas, S., Santonastaso, M. and Corrigan, E. (2015a) *Emotional Processing Scale Manual*. Oxford, UK: Hogrefe.

Baker, R., Thomas, P., Thomas, S., Santonastaso, M. and Corrigan, E. (2015b) *Norms Booklet Version 1 Emotional Processing Scale .* Oxford, UK: Hogrefe.

Baker, R., Thomas, S., Thomas, P.W., Gower, P., Santonastaso, M. and Whittlesea, A. (2010) The Emotional Processing Scale: Scale refinement and abridgement (EPS-25). *Journal of Psychosomatic Research* 68 (1), 83-88.

Baker, R., Thomas, S., Thomas, P.W. and Owens, M. (2007) Development of an emotional processing scale. *Journal of Psychosomatic Research,* 62 (2), 167-178.

Bartels, H., Pedersen, S.S., Van Der Laan, B.F., Staal, M.J., Albers, F.W. and Middel, B. (2010) The impact of Type D personality on health-related quality of life in tinnitus patients is mainly mediated by anxiety and depression. *Otology & Neurotology,* 31 (1), 11-18.

Beck, A.T. (1996) Beyond belief: A Theory of Modes, Personality, and Psychopathology IN: Salkovskis, P.M. (ed.) *Frontiers of Cognitive Therapy* New York, NY: The Guilford Press, 1-25.

Beck, A.T., Ward, C. and Mendelson, M. (1961) Beck depression inventory (BDI). *Archives of General Psychiatry,* 4 (6), 561-571.

Bendig, A.W. (1956) The development of a short form of the Manifest Anxiety Scale. *Journal of Consulting Psychology,* 20 (5), 384.

Blackledge, J.T. and Hayes, S.C. (2001) Emotion regulation in Acceptance and Commitment Therapy. *Journal of Clinical Psychology,* 57 (2), 243-255.

Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology,* 3 (2), 77-101.

Braun, V. and Clarke, V. (2013) *Successful Qualitative Research: A Practical Guide for Beginners*. London: SAGE publications.

Brooks, S.K., Chalder, T. and Rimes, K.A. (2017) Chronic Fatigue Syndrome: cognitive, behavioural and emotional processing vulnerability factors. *Behavioural and Cognitive Psychotherapy,* 45 (2), 156-169.

Brosschot, J.F. and Thayer, J.F. (2004) Worry, Perseverative Thinking and Health IN: Nyklíček, I., Temoshok, L. and Vingerhoets, A. (eds.) *Emotional Expression and Health: Advances in Theory, Assessment and Clinical Applications.* New York, NY: Brunner-Routledge, 99-114.

Budd, R.J. and Pugh, R. (1996) The relationship between coping style, tinnitus severity and emotional distress in a group of tinnitus sufferers. *British Journal of Health Psychology,* 1 (3), 219-229.

Burls, A. (2009) *What is critical appraisal?* Available from: http://www.whatisseries.co.uk/whatiscriticalappraisal [Accessed 12/10/10].

Cameron, L.D. and Leventhal, H. (2003) *The Self-Regulation of Health and Illness Behaviour*. London: Routledge.

Campbell-Sills, L., Barlow, D.H., Brown, T.A. and Hofmann, S.G. (2006) Acceptability and suppression of negative emotion in anxiety and mood disorders. *Emotion,* 6 (4), 587-595.

Charmaz, K. (2006) *Constructing Grounded Theory: A Practical Guide through Qualitative Research*. London: SAGE Publications.

Chawla, N. and Ostafin, B. (2007) Experiential avoidance as a functional dimensional approach to psychopathology: An empirical review. *Journal of Clinical Psychology,* 63 (9), 871-890.

Cima, R.F., Crombez, G. and Vlaeyen, J.W. (2011) Catastrophizing and fear of tinnitus predict quality of life in patients with chronic tinnitus. *Ear & Hearing,* 32 (5), 634-641.

Cokely, C.G. and Deplacido, C.G. (2012) Fostering reflective skills in audiology practice and education. *Seminars in Hearing,* 33 (1), 65-77.

Conway, M.A. and Bekerian, D.A. (1987) Organization in autobiographical memory. *Memory & Cognition,* 15 (2), 119-132.

Cosmides, L. and Tooby, J. (2000) Evolutionary Psychology and the Emotions IN: Lewis, M. and Haviland-Jones, J.M. (eds.) *Handbook of Emotions*, 2nd ed. New York, NY: The Guilford Press, 91-115.

Creswell, J.W. (2014) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 4th ed. London, UK: Sage publications.

Croft, C. (2008) *Acceptance and Tinnitus Severity*, Doctoral thesis, New England University, USA.

Croft, C., Brown, R.F., Thorsteinsson, E.B. and Noble, W. (2013a) Development of the Tinnitus Response Scales: factor analyses, subscale reliability and validity analyses. *The International Tinnitus Journal,* 18 (1), 45-56. Available from: http://www.tinnitusjournal.com/10.5935/0946-5448.2013000 [Accessed 18 November 2015].

Croft, C., Brown, R.F., Thorsteinsson, E.B. and Noble, W. (2013b) Is tinnitus acceptance the same as tinnitus habituation? *The International Tinnitus Journal,* 18 (2), 143-148. Available from: http://www.tinnitusjournal.com/10.5935/0946-5448.20130018 [Accessed 11 July 2015].

Cronin, P., Ryan, F. and Coughlan, M. (2008) Undertaking a literature review: a step-by-step approach. *British Journal of Nursing,* 17 (1), 38-43.

Dancey, C.P. and Reidy, J. (2004) *Statistics without Maths for Psychology* 4th ed. Harlow, UK: Pearson Education Limited.

Dauman, N. and Erlandsson, S.I. (2012) Learning from tinnitus patients' narratives - A case study in the psychodynamic approach. *International Journal of Qualitative Studies of Health and Wellbeing,* 7, 1-11.

List of References

Davis, A. and El Rafaie, A. (2000) Epidemiology of Tinnitus IN: Tyler, R.S. (ed.) *Tinnitus Handbook*. San Diego, CA: Singular Thompson Learning, 1-23.

De Ridder, D., Geenen, R., Kuijer, R. and Van Middendorp, H. (2008) Psychological adjustment to chronic disease. *The Lancet,* 372 (9634), 246-255.

Denollet, J. (2005) DS14: standard assessment of negative affectivity, social inhibition, and Type D personality. *Psychosomatic Medicine,* 67 (1), 89-97.

Denollet, J., Gidron, Y., Vrints, C.J. and Conraads, V.M. (2010) Anger, suppressed anger, and risk of adverse events in patients with coronary artery disease. *The American Journal of Cardiology,* 105 (11), 1555-1560.

Di Tella, M. and Castelli, L. (2016) Alexithymia in chronic pain disorders. *Current Rheumatology Reports,* 18 (7), 1-9.

Di Tella, M., Ghiggia, A., Tesio, V., Romeo, A., Colonna, F., Fusaro, E., Torta, R. and Castelli, L. (2017) Pain experience in Fibromyalgia Syndrome: the role of alexithymia and psychological distress. *Journal of Affective Disorders,* 208, 87-93.

Dimillo, J., Samson, A., Thériault, A., Lowry, S., Corsini, L., Verma, S. and Tomiak, E. (2013) Living with the BRCA genetic mutation: An uncertain conclusion to an unending process. *Psychology, Health & Medicine,* 18 (2), 125-134.

Douek, E. (1981) Classification of tinnitus IN: Evered, D. and Lawrenson, G. (eds.) *Ciba Foundation Symposium 85 -Tinnitus*. Chichester, UK: Wiley, 4-15.

Egan, G. (1990) *The Skilled Helper: A Systematic Approach to Effective Helping*, 4th ed. Belmont, CA: Brooks/Cole Publishing.

Esteves, J.E., Wheatley, L., Mayall, C. and Abbey, H. (2013) Emotional processing and its relationship to chronic low back pain: Results from a case-control study. *Manual Therapy,* 18 (6), 541-546.

Eysenck, H.J. and Eysenck, S.B.G. (1975) *Manual of the Eysenck Personality Questionnaire*. London: Hodder and Stoughton.

Foa, E.B. and Kozak, M.J. (1986) Emotional processing of fear: exposure to corrective information. *Psychological Bulletin,* 99 (1), 20-35.

Fordyce, W.E., Shelton, J.L. and Dundore, D.E. (1982) The modification of avoidance learning pain behaviors. *Journal of Behavioral Medicine,* 5 (4), 405-414.

Frijda, N.H. (2007) *The Laws of Emotion*. New Jersey, NJ: Lawrence Erlbaum Associates.

Frisch, M.B., Cornell, J., Villanueva, M. and Retzlaff, P.J. (1992) Clinical validation of the Quality of Life Inventory. A measure of life satisfaction for use in treatment planning and outcome assessment. *Psychological Assessment,* 4 (1), 92-101.

Geenen, R., Van Ooijen-Van Der Linden, L., Lumley, M.A., Bijlsma, J.W.J. and Van Middendorp, H. (2012) The match–mismatch model of emotion processing styles and emotion regulation strategies in fibromyalgia. *Journal of Psychosomatic Research,* 72 (1), 45-50.

Gendlin, E. (1996) *Focusing-Orientated Psychotherapy*. New York, NY: The Guilford Press.

Gendlin, E. (2003) *Focusing* 3rd ed. London: Random House.

Gheldof, E.L., Vinck, J., Bussche, E., Vlaeyen, J.W., Hidding, A. and Crombez, G. (2006) Pain and pain related fear are associated with functional and social disability in an occupational setting: evidence of mediation by pain related fear. *European Journal of Pain,* 10 (6), 513-525.

Gibbs, G.R. (2008) *Analysing Qualitative Data*. London: SAGE Publications.

Goldberg, D. and Williams, P. (1988) *A User's Guide to the General Health Questionnaire*. Windsor, UK: NFER.

Greenberg, L. (2006) Emotion-Focused Therapy: A Synopsis. *Journal of Contemporary Psychotherapy,* 36 (2), 87-93.

Greenberg, L. and Safran, J. (1987) *Emotion in Psychotherapy*. New York, NY: The Guilford Press.

Greenberg, L.S. (2004) Emotion–focused therapy. *Clinical Psychology & Psychotherapy,* 11 (1), 3-16.

Greenberg, L.S. and Pascual-Leone, A. (2006) Emotion in psychotherapy: a practice friendly research review. *Journal of Clinical Psychology,* 62 (5), 611-630.

Greimel, K.V. and Kröner-Herwig, B. (2011) Cognitive Behavioral Treatment (CBT) IN: Møller, A.R., Langguth, B., Deridder, D. and Kleinjung, T. (eds.) *Textbook of Tinnitus*. London: Springer, 557-561.

Gros, C.P., Parr, C., Wright, D.K., Montreuil, M. and Frechette, J. (2017) Hospital rules and regulations: The perspectives of youth receiving psychiatric care. *Journal of Child & Adolescent Psychiatric Nursing,* 30 (1), 18.

Gross, J.J. and John, O.P. (1998) Mapping the domain of expressivity: multimethod evidence for a hierarchical model. *Journal of Personality and Social Psychology,* 74 (1), 170-191.

Gross, J.J. and John, O.P. (2003) Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology,* 85 (2), 348-362.

Gross, J.J. and Levenson, R.W. (1993) Emotional suppression: physiology, self-report, and expressive behavior. *Journal of Personality and Social Psychology,* 64 (6), 970-986.

Gross, J.J. and Levenson, R.W. (1997) Hiding feelings: the acute effects of inhibiting negative and positive emotion. *Journal of Abnormal Psychology,* 106 (1), 95-103.

Gross, J.J. and Thompson, R.A. (2007) Emotion Regulation: Conceptual Foundations *Handbook of Emotion Regulation.* New York, NY, US: The Guilford Press, 3-24.

Guest, G., Bunce, A. and Johnson, L. (2006) How Many Interviews Are Enough?: An Experiment with Data Saturation and Variability. *Field Methods,* 18 (1), 59-82.

Guetterman, T.C. (2015) Descriptions of Sampling Practices Within Five Approaches to Qualitative Research in Education and the Health Sciences. *Forum: Qualitative Social Research,* 16 (2).

Hall, J.M. (2010) Narrative methods in a study of trauma recovery. *Qualitative Health Research,* 21 (1), 3-13. Available from: http://journals.sagepub.com/doi/abs/10.1177/1049732310377181 [Accessed 12th March 2015].

Hallam, R., Jakes, S. and Hinchcliffe, R. (1988) Cognitive variables in tinnitus annoyance. *British Journal of Clinical Psychology,* 27 (3), 213-222.

Hallam, R., Rachman, S. and Hinchcliffe, R. (1984) Psychological aspects of tinnitus IN: Rachman, S. (ed.) *Contributions to Medical Psychology*. Oxford, UK: Pergamon, 31-53.

Hannaford, P.C., Simpson, J.A., Bisset, A.F., Davis, A., Mckerrow, W. and Mills, R. (2005) The prevalence of ear, nose and throat problems in the community: results from a national cross-sectional postal survey in Scotland. *Family Practice,* 22 (3), 227-233.

Harvey, A.G. (2002) A cognitive model of insomnia. *Behaviour Research and Therapy,* 40 (8), 869-893.

Hayes, S.C., Strosahl, K., Wilson, K.G. and Bissett, R.T. (2004) Measuring experiential avoidance: a preliminary test of a working model. *The Psychological Record,* 54 (4), 553-578.

Hayes, S.C., Strosahl, K.D. and Wilson, K.G. (1999) *Acceptance and Commitment Therapy: An Experiential Approach to Behavior Change*. New York, NY: The Guilford Press.

Hayes, S.C., Villatte, M., Levin, M. and Hildebrandt, M. (2011) Open, aware, and active: contextual approaches as an emerging trend in the behavioral and cognitive therapies. *Annual Review of Clinical Psychology,* 7 (4), 141-168.

Hayes, S.C., Wilson, K.G., Gifford, E.V., Follette, V.M. and Strosahl, K. (1996) Experiential avoidance and behavioral disorders: a functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology,* 64 (6), 1152-1168.

Hays, R.D., Sherbourne, C.D. and Mazel, R.M. (1993) The RAND 36-item health survey 1.0. *Health Economics,* 2 (3), 217-227.

Hébert, S. and Carrier, J. (2007) Sleep complaints in elderly tinnitus patients: a controlled study. *Ear & Hearing,* 28 (5), 649-655.

Henry, J. and Wilson, P. (1994) Coping with tinnitus: two studies of psychological and audiological characteristics of patients with high and low tinnitus-related distress. *The International Tinnitus Journal,* 1 (2), 85-92.

Henry, J.A., Roberts, L.E., Caspary, D.M., Theodoroff, S.M. and Salvi, R.J. (2014) Underlying mechanisms of tinnitus: review and clinical implications. *Journal of the American Academy of Audiology,* 25 (1), 5-22.

Henry, J.D., Crawford, J.R., Bedford, A., Crombie, C. and Taylor, E.P. (2002) The Personal Disturbance Scale (sAD): normative data and latent structure in a large non-clinical sample. *Journal for the International Society for the Study of Individual Differences,* 33 (8), 1343-1360.

Henry, J.L. and Wilson, P.H. (1998) An evaluation of two types of cognitive intervention in the management of chronic tinnitus. *Scandinavian Journal of Behaviour Therapy,* 27 (4), 156-166.

Hesser, H. and Andersson, G. (2009) The role of anxiety sensitivity and behavioral avoidance in tinnitus disability. *International Journal of Audiology,* 48 (5), 295-299.

Hesser, H., Bånkestad, E. and Andersson, G. (2015) Acceptance of tinnitus as an independent correlate of tinnitus severity. *Ear and Hearing,* 36 (4), 176-182.

Hesser, H., Weise, C., Westin, V.Z. and Andersson, G. (2011) A systematic review and meta-analysis of randomized controlled trials of Cognitive–Behavioral Therapy for tinnitus distress. *Clinical Psychology Review,* 31 (4), 545-553.

Hoare, D.J., Broomhead, E., Stockdale, D. And Kennedy, V., (2015) Equity and person-centeredness in provision of tinnitus services in UK National Health Service audiology departments. *European Journal for Person Centered Healthcare,* 3 (3). Available from: http://dx.doi.org/10.5750/ejpch.v3i3 [Accessed 28/7/16].

Holmes, D., Kennedy, S.L. and Perron, A. (2004) The mentally ill and social exclusion: a critical examination of the use of seclusion from the patient's perspective. *Issues in Mental Health Nursing,* 25 (6), 559-578.

Horsham, S. and Chung, M.C. (2013) Investigation of the relationship between trauma and pain catastrophising: the roles of emotional processing and altered self-capacity. *Psychiatry Research,* 208 (3), 274-284.

Jastreboff, P. (1990) Phantom auditory perception (tinnitus): mechanisms of generation and perception. *Neuroscience Research,* 8, 221-254.

Jastreboff, P.J. and Hazell, J.W.P. (1993) A neurophysiological approach to tinnitus: Clinical implications. *British Journal of Audiology,* 27 (1), 7-17.

Jesson, J., Matheson, L. and Lacey, F.M. (2011) *Doing your Literature Review: Traditional and Systematic Techniques*. London: SAGE Publications.

Jones, K. (2007) Doing a Literature Review in Health IN: Saks, M. and Allsop, J. (eds.) *Researching Health: Qualitative, Quantitative and Mixed Methods*. London: SAGE Publications, 32-53.

Kaldo-Sandström, V., Larsen, H.C. and Andersson, G. (2004) Internet-based cognitive-behavioral self-help treatment of tinnitus: clinical effectiveness and predictors of outcome. *American Journal of Audiology,* 13 (2), 185-192.

Kamalski, D.M., Hoekstra, C.E., Zanten, B.G.V., Grolman, W. and Rovers, M.M. (2010) Measuring disease-specific health-related quality of life to evaluate treatment outcomes in tinnitus patients: a systematic review. *Otolaryngology- Head and Neck Surgery,* 143 (2), 181-185.

Keefe, F.J., Lumley, M., Anderson, T., Lynch, T. and Carson, K.L. (2001) Pain and emotion: new research directions. *Journal of Clinical Psychology,* 57 (4), 587-607.

Keltner, D., Oatley, K. and Jenkins, J.M. (2013) *Understanding Emotions*, 3rd ed. New York, NY: Wiley.

Kennedy-Moore, E. and Watson, J.C. (1999) *Expressing Emotion: Myths, Realities and Therapeutic Strategies*. New York, NY: The Guilford Press.

Kennedy, V., Wilson, C. and Stephens, D. (2004) Quality of life and tinnitus. *Audiological Medicine,* 2 (1), 29-40.

Khedr, E.M., Ahmed, M.A., Shawky, O.A., Mohamed, E.S., El Attar, G.S. and Mohammad, K.A. (2010) Epidemiological study of chronic tinnitus in Assiut, Egypt. *Neuroepidemiology,* 35 (1), 45-52. Available from: https://www.karger.com/Journal/Issue/25401210.1159/00030663 [Accessed 6 March 2012].

Kleinstauber, M., Jasper, K., Schweda, I., Hiller, W., Andersson, G. and Weise, C. (2013) The role of fear-avoidance cognitions and behaviors in patients with chronic tinnitus. *Cognitive Behaviour Therapy,* 42 (2), 84-99.

Kleres, J. (2011) Emotions and narrative analysis: a methodological approach. *Journal for the Theory of Social Behaviour,* 41 (2), 182-202.

Kojima, M., Kojima, T., Suzuki, S., Takahashi, N., Funahashi, K., Kato, D., Hanabayashi, M., Hirabara, S., Asai, S. and Ishiguro, N. (2014) Alexithymia, depression, inflammation, and pain in patients with rheumatoid arthritis. *Arthritis Care & Research,* 66 (5), 679-686.

Kuk, F.K., Tyler, R.S., Russell, D. and Jordan, H. (1990) The psychometric properties of a Tinnitus Handicap Questionnaire. *Ear & Hearing,* 11 (6), 434-445.

Langguth, B., Kreuzer, P.M., Kleinjung, T. and De Ridder, D. (2013) Tinnitus: causes and clinical management. *The Lancet Neurology,* 12 (9), 920-930.

Lazarus, R.S. (1966) *Psychological Stress and the Coping Process*. New York, NY: McGraw-Hill.

Lazarus, R.S. (1991) *Emotion and Adaptation*. New York, NY: Oxford University Press.

Leventhal, H., Benyamini, Y., Brownlee, S., Diefenbach, M., Leventhal, E.A., Patrick-Miller, L. and Robitaille, C. (1997) Illness Representations: Theoretical Foundations IN: Petrie, K.J. and J, W. (eds.) *Perceptions of Health and Illness*. Amsterdam: Harwood Academic Publishers, 19-46.

Leventhal, H., Bodnar-Deren, S., Breland, J.Y., Hash-Converse, J., Phillips, L.A., Leventhal, E. and Cameron, L.D. (2012) Modeling Health and Illness Behavior: The Approach of the Common-Sense Model IN: Baum, A., Revenson, T. and Singer, J. (eds.) *Handbook of Health Psychology*, 2nd ed. New York, NY: Psychology Press, 3-36.

Leventhal, H., Meyer, D. and Nerenz, D. (1980) The Common Sense Representation of Illness Danger IN: Rachman, S.J. (ed.) *Contributions to Medical Psychology*. Oxford, UK: :Pergamon, 7-30.

Lockwood, A.H., Salvi, R.J. and Burkard, R.F. (2002) Tinnitus. *New England Journal of Medicine,* 347 (12), 904-910.

Lothian, S. (2002) *Emotional processing deficits and colorectal cancer: a theoretical overview and empirical investigation*, PhD Thesis, University of Southampton, UK.

Lovibond, S. and Lovibond, P. (1995) *Manual for the Depression Anxiety Stress Scales* 2nd ed. Sydney, Australia: Psychology Foundation.

Lumley, M.A., Cohen, J.L., Borszcz, G.S., Cano, A., Radcliffe, A.M., Porter, L.S., Schubiner, H. and Keefe, F.J. (2011) Pain and emotion: a biopsychosocial review of recent research. *Journal of Clinical Psychology,* 67 (9), 942-968.

Lumley, M.A., Neely, L.C. and Burger, A.J. (2007) The assessment of alexithymia in medical settings: implications for understanding and treating health problems. *Journal of Personality Assessment,* 89 (3), 230-246.

Lumley, M.A., Radcliffe, A.M., Macklem, D.J., Mosley-Williams, A., Leisen, J.C., Huffman, J.L., D' Souza, P.J., Gillis, M.E., Meyer, T.M. and Kraft, C.A. (2005) Alexithymia and pain in three chronic pain samples: comparing Caucasians and African Americans. *Pain Medicine,* 6 (3), 251-261.

MacDonald, S. (2002) *Factor analysis of the Tinnitus Reaction Questionnaire: a comparison between Internet and paper-and-pencil versions*, Unpublished PhD thesis, University of Uppsala, Sweden.

Maltby, J., Williams, G., Mcgarry, J. and Day, L. (2014) *Research Methods for Nursing and Healthcare*. London: Routledge.

Mann, K., Gordon, J. and Macleod, A. (2009) Reflection and reflective practice in health professions education: a systematic review. *Advances in Health Sciences Education,* 14 (4), 595-621.

Marchant, L. and Payne, H. (2002) The experience of counselling for female clients with anorexia nervosa: A person-centred perspective. *Counselling and Psychotherapy Research,* 2 (2), 127-132.

Margalit, D., Har, L.B., Brill, S. and Vatine, J.-J. (2014) Complex regional pain syndrome, alexithymia, and psychological distress. *Journal of Psychosomatic Research,* 77 (4), 273-277.

Mason, M. (2010) Sample Size and Saturation in PhD Studies Using Qualitative Interviews. *Forum: Qualitative Social Research,* 11 (3).

Mathias, E. (2013) *Emotional processing and its contribution to neck pain*. British School of Osteopathy, London, UK.

Mayer, J.D. and Salovey, P. (1997) What is Emotional Intelligence? IN: P. Salovey, P. and Sluyter, D. (eds.) *Emotional Development and Emotional Intelligence: Implications for Educators*. New York, NY: Basic Books, 3-31.

Mayer, J.D., Salovey, P. and Caruso, D.R. (2004) Emotional intelligence: theory, findings, and implications. *Psychological Inquiry,* 15 (3), 197-215.

McCracken, L.M. (1998) Learning to live with the pain: acceptance of pain predicts adjustment in persons with chronic pain. *Pain,* 74 (1), 21-27.

McCracken, L.M. and Keogh, E. (2009) Acceptance, mindfulness, and values-based action may counteract fear and avoidance of emotions in chronic pain: an analysis of anxiety sensitivity. *The Journal of Pain,* 10 (4), 408-415.

McCracken, L.M., Vowles, K.E. and Eccleston, C. (2004) Acceptance of chronic pain: component analysis and a revised assessment method. *Pain,* 107 (1), 159-166.

McKenna, L. (2004) Models of tinnitus suffering and treatment compared and contrasted. *Audiological Medicine,* 2 (1), 41-53.

McKenna, L., Handscomb, L., Hoare, D.J. and Hall, D.A. (2014) A scientific cognitive-behavioral model of tinnitus: novel conceptualizations of tinnitus distress. *Frontiers In Neurology,* 5, 196-196.

McKenna, L. and Irwin, R. (2008) Sound therapy for tinnitus–sacred cow or idol worship?: An investigation of the evidence. *Audiological Medicine,* 6 (1), 16-24.

Meikle, M. and Taylor-Walsh, E. (1984) Characteristics of tinnitus and related observations in over 1800 tinnitus clinic patients. *The Journal of Laryngology & Otology,* 98 (S9), 17-21.

Meikle, M.B., Stewart, B.J., Griest, S.E. and Henry, J.A. (2008) Tinnitus outcomes assessment. *Trends in Amplification,* 12 (3), 223-235.

Meric, C., Gartner, M., Collet, L. and Chéry-Croze, S. (1998) Psychopathological profile of tinnitus sufferers: evidence concerning the relationship between tinnitus features and impact on life. *Audiology and Neurotology,* 3 (4), 240-252.

Meric, C., Pham, E. and Chery-Croze, S. (2000) Validation assessment of a French version of the Tinnitus Reaction Questionnaire: a comparison between data from English and French versions. *Journal of Speech, Language, and Hearing Research,* 43 (1), 184-190.

Miguel, G.S., Yaremchuk, K., Roth, T. and Peterson, E. (2014) The effect of insomnia on tinnitus. *Annals of Otology, Rhinology & Laryngology,* 123 (10), 696-700.

Mitmansgruber, H., Beck, T.N., Höfer, S. and Schüßler, G. (2009) When you don't like what you feel: experiential avoidance, mindfulness and meta-emotion in emotion regulation. *Personality and Individual Differences,* 46 (4), 448-453.

Moore, S.A., Zoellner, L.A. and Mollenholt, N. (2008) Are expressive suppression and cognitive reappraisal associated with stress-related symptoms? *Behaviour Research and Therapy,* 46 (9), 993-1000.

Moors, A., Ellsworth, P.C., Scherer, K.R. and Frijda, N.H. (2013) Appraisal theories of emotion: state of the art and future development. *Emotion Review,* 5 (2), 119-124.

Morris, A.S., Silk, J.S., Steinberg, L., Myers, S.S. and Robinson, L.R. (2007) The role of the family context in the development of emotion regulation. *Social Development,* 16 (2), 361-388.

Moss-Morris, R., Weinman, J., Petrie, K., Horne, R., Cameron, L. and Buick, D. (2002) The revised illness perception questionnaire (IPQ-R). *Psychology and Health,* 17 (1), 1-16.

Murray, E.J. and Segal, D.L. (1994) Emotional processing in vocal and written expression of feelings about traumatic experiences. *Journal of Traumatic Stress,* 7 (3), 391-405.

Newman, C.W. and Sandridge, S.A. (2004) Tinnitus Questionnaires IN: Snow, J.B. (ed.) *Tinnitus: Theory and Management*. Hamilton, ON: BC Decker, 237-254.

Nondahl, D.M., Cruickshanks, K.J., Huang, G.-H., Klein, B.E., Klein, R., Javier Nieto, F. and Tweed, T.S. (2011) Tinnitus and its risk factors in the Beaver Dam offspring study. *International Journal of Audiology,* 50 (5), 313-320.

Oatley, K. and Johnson-Laird, P.N. (1987) Towards a cognitive theory of emotions. *Cognition and Emotion,* 1 (1), 29-50.

Ocañez, K.L., Kathryn Mchugh, R. and Otto, M.W. (2010) A meta-analytic review of the association between anxiety sensitivity and pain. *Depression and Anxiety,* 27 (8), 760-767.

Oiticica, J. and Bittar, R.S.M. (2015) Tinnitus prevalence in the city of São Paulo. *Brazilian Journal of Otorhinolaryngology,* 81 (2), 167-176.

Park, R. and Moon, J. (2014) Prevalence and risk factors of tinnitus: the Korean National Health and Nutrition Examination Survey 2010–2011, a cross-sectional study. *Clinical Otolaryngology,* 39 (2), 89-94.

Parving, A., Hein, H.O., Suadicani, P., Ostri, B. and Gyntelberg, F. (1993) Epidemiology of hearing disorders. Some factors affecting hearing. The Copenhagen Male Study. *Scandinavian Audiology,* 22 (2), 101.

Pennebaker, J.W. (1995) *Emotion, Disclosure, & Health*. Washington, DC: The American Psychological Association.

Pennebaker, J.W. (1997) Writing about emotional experiences as a therapeutic process. *Psychological Science,* 8 (3), 162-166.

Pett, M.A., Lackey, N.R. and Sullivan, J.J. (2003) *Making Sense of Factor Analysis: The Use of Factor Analysis for Instrument Development in Health Care Research*. London: SAGE Publications.

Philips, H.C. (1987) Avoidance behaviour and its role in sustaining chronic pain. *Behaviour Research and Therapy,* 25 (4), 273-279.

Phillips, J.S. and Mcferran, D. (2010) Tinnitus Retraining Therapy (TRT) for tinnitus. Available from: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD007330 [Accessed 11 March 2015].

Portney, L.G. and Watkins, M.P. (2009) *Foundations of Clinical Research: Applications to Practice*. London: Pearson/Prentice Hall.

Quaranta, A., Assennato, G. and Sallustio, V. (1996) Epidemiology of hearing problems among adults in Italy. *Scandinavian Audiology. Supplementum,* 42, 9-13.

Quartana, P.J., Campbell, C.M. and Edwards, R.R. (2009) Pain catastrophizing: a critical review. *Expert Review of Neurotherapeutics,* 9 (5), 745-758.

Rachman, S. (1977) The conditioning theory of fear acquisition: a critical examination. *Behaviour Research and Therapy,* 15 (5), 375-387.

Rachman, S. (1980) Emotional processing. *Behaviour Research and Therapy,* 18 (1), 51-60.

Rachman, S. (2001) Emotional processing, with special reference to post-traumatic stress disorder. *International Review of Psychiatry,* 13 (3), 164-171.

Ramírez-Maestre, C. and Esteve, R. (2013) Disposition and adjustment to chronic pain. *Current Pain and Headache Reports,* 17 (3), 312.

Rammstedt, B. and John, O.P. (2007) Measuring personality in one minute or less: a 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality,* 41 (1), 203-212.

Randolph, J.J. (2009) A guide to writing the dissertation literature review. *Practical Assessment, Research & Evaluation,* 14 (13), 1-13.

Reiss, S. and Mcnally, R. (1985) The Expectancy Model of Fear IN: Reiss, S. and Bootzin, R. (eds.) *Theoretical Issues in Behaviour Therapy*. San Diego, CA: Academic Press 107-121.

Reiss, S., Peterson, R.A., Gursky, D.M. and Mcnally, R.J. (1986) Anxiety sensitivity, anxiety frequency and the prediction of fearfulness. *Behaviour Research and Therapy,* 24 (1), 1-8.

Reynolds, H.R., Jones, L.A. and Rickards, H.E. (2014) Emotional processing in adults with functional neurological symptoms. *Journal of Neurology, Neurosurgery & Psychiatry,* 85 (8). Available from: http://dx.doi.org/10.1136/jnnp-2014-308883.33 [Accessed 1st August 2016].

Roberton, T., Daffern, M. and Bucks, R.S. (2012) Emotion regulation and aggression. *Aggression and Violent Behavior,* 17 (1), 72-82.

Rogers, C.R. (1961) *On Becoming a Person: A Therapist's View of Psychotherapy*. London: Constable.

Sadlier, M., Stephens, S. and Kennedy, V. (2008) Tinnitus rehabilitation: a mindfulness meditation cognitive behavioural therapy approach. *The Journal of Laryngology & Otology,* 122 (1), 31-37.

Salkovskis, P.M. (1991) The importance of behaviour in the maintenance of anxiety and panic: a cognitive account. *Behavioural Psychotherapy,* 19 (1), 6-19.

Salovey, P. and Mayer, J.D. (1990) Emotional intelligence. *Imagination, Cognition and Personality,* 9 (3), 185-211.

Santonastaso, M. (2011) *Cross-cultural comparison of emotional processing: A quantitative psychological study of healthy participants and chronic pain patients from England, Italy and Japan.*, Unpublished PhD thesis, University of Bournemouth, UK.

Scherer, K.R. (2004) Feelings Integrate the Central Representation of Appraisal-driven Response Organization in Emotion IN: Manstead, A.S.R., Frijda, N. and Fischer, A. (eds.) *Feelings and Emotions: The Amsterdam Symposium*. New York, NY: Cambridge University Press, 136-157.

Schon, D.A. (1983) *The Reflective Practitioner: How Practitioners Think In Action*. London: Temple Smith.

Schutte, N.S., Malouff, J.M., Hall, L.E., Haggerty, D.J., Cooper, J.T., Golden, C.J. and Dornheim, L. (1998) Development and validation of a measure of emotional intelligence. *Personality and Individual Differences,* 25 (2), 167-177.

Schutte, N.S., Malouff, J.M., Thorsteinsson, E.B., Bhullar, N. and Rooke, S.E. (2007) A meta-analytic investigation of the relationship between emotional intelligence and health. *Personality and Individual Differences,* 42 (6), 921-933.

Schutte, N.S., Noble, W., Malouff, J.M. and Bhullar, N. (2009) Evaluation of a model of distress related to tinnitus. *International Journal of Audiology,* 48 (7), 428-432.

Shargorodsky, J., Curhan, G.C. and Farwell, W.R. (2010) Prevalence and characteristics of tinnitus among US adults. *The American Journal of Medicine,* 123 (8), 711-718.

Sharp, T.J. (2001) Chronic pain: a reformulation of the cognitive-behavioural model. *Behaviour Research and Therapy,* 39 (7), 787-800.

Sheppes, G., Scheibe, S., Suri, G., Radu, P., Blechert, J. and Gross, J.J. (2014) Emotion regulation choice: a conceptual framework and supporting evidence. *Journal of Experimental Psychology-General,* 143 (1), 163-181.

Silverman, D. (2013) *Doing Qualitative Research*, 4th ed. London: SAGE Publications.

Sirois, F.M., Davis, C.G. and Morgan, M.S. (2006) " Learning to live with what you can't rise above": control beliefs, symptom control, and adjustment to tinnitus. *Health Psychology,* 25 (1), 119-123.

Sools, A.M., Murray, M. and Westerhof, G.J. (2015) Narrative health psychology: once more unto the breach. *Journal of Health Psychology,* 20 (3), 239-245.

Spielberger, C.D., Gorsuch, R.L. and Lushene, R.E. (1970) *State-Trait Anxiety Inventory.* Palo Alto, CA: Consulting Psychologists Press.

Spielberger, C.D., Gorsuch, R.L., Lushene, R.E., Vagg, P.R. and Jacobs, G.A. (1983) *Manual for the State-Trait Anxiety Inventory* Palo Alto, CA: Consulting Psychological Press.

Spinhoven, P., Ormel, J., Sloekers, P., Kempen, G., Speckens, A. and Van Hemert, A. (1997) A validation study of the Hospital Anxiety and Depression Scale (HADS) in different groups of Dutch subjects. *Psychological Medicine,* 27 (2), 363-370.

Sullivan, M.J., Thorn, B., Haythornthwaite, J.A., Keefe, F., Martin, M., Bradley, L.A. and Lefebvre, J.C. (2001) Theoretical perspectives on the relation between catastrophizing and pain. *The Clinical Journal of Pain,* 17 (1), 52-64.

Taylor, G.J. (1984) Alexithymia: concept, measurement, and implications for treatment. *The American Journal of Psychiatry,* 141 (6), 725-732.

Taylor, G.J. and Bagby, R.M. (1988) Measurement of alexithymia: recommendations for clinical practice and future research. *Psychiatric Clinics of North America,* 11 (3), 351-366.

Taylor, G.J. and Bagby, R.M. (2004) New trends in alexithymia research. *Psychotherapy and Psychosomatics,* 73 (2), 68-77.

Taylor, S., Zvolensky, M.J., Cox, B.J., Deacon, B., Heimberg, R.G., Ledley, D.R., Abramowitz, J.S., Holaway, R.M., Sandin, B. and Stewart, S.H. (2007) Robust dimensions of anxiety sensitivity: development and initial validation of the Anxiety Sensitivity Index-3. *Psychological assessment,* 19 (2), 176.

Teunisse, R.J. and Olde Rikkert, M.G. (2012) Prevalence of musical hallucinations in patients referred for audiometric testing. *American Journal of Geriatric Psychiatry,* 20 (12), 1075-1077.

Trost, Z., Vangronsveld, K., Linton, S.J., Quartana, P.J. and Sullivan, M.J. (2012) Cognitive dimensions of anger in chronic pain. *Pain,* 153 (3), 515-517.

Van Middendorp, H., Lumley, M.A., Jacobs, J.W.G., Van Doornen, L.J.P., Bijlsma, J.W.J. and Geenen, R. (2008) Emotions and emotional approach and avoidance strategies in fibromyalgia. *Journal of Psychosomatic Research,* 64 (2), 159-167.

Viane, I., Crombez, G., Eccleston, C., Poppe, C., Devulder, J., Van Houdenhove, B. and De Corte, W. (2003) Acceptance of pain is an independent predictor of mental well-being in patients with chronic pain: empirical evidence and reappraisal. *Pain,* 106 (1), 65-72.

Watson, M. and Greer, S. (1983) Development of a questionnaire measure of emotional control. *Journal of Psychosomatic Research,* 27 (4), 299-305.

Westin, V., Hayes, S.C. and Andersson, G. (2008) Is it the sound or your relationship to it? The role of acceptance in predicting tinnitus impact. *Behaviour Research and Therapy,* 46 (12), 1259-1265.

Westin, V.Z., Schulin, M., Hesser, H., Karlsson, M., Noe, R.Z., Olofsson, U., Stalby, M., Wisung, G. and Andersson, G. (2011) Acceptance and Commitment Therapy versus Tinnitus Retraining Therapy in the treatment of tinnitus: a randomised controlled trial. *Behaviour Research and Therapy,* 49 (11), 737-747.

Whelton, W.J. (2004) Emotional processes in psychotherapy: evidence across therapeutic modalities. *Clinical Psychology & Psychotherapy,* 11 (1), 58-71.

White, K.S., Mcdonnell, C.J. and Gervino, E.V. (2011) Alexithymia and anxiety sensitivity in patients with non-cardiac chest pain. *Journal of Behavior Therapy and Experimental Psychiatry,* 42 (4), 432-439.

Wilson, P.H., Henry, J., Bowen, M. and Haralambous, G. (1991) Tinnitus Reaction Questionnaire: psychometric properties of a measure of distress associated with tinnitus. *Journal of Speech and Hearing Research,* 34 (1), 197-201.

Wilson, P.H. and Henry, J.L. (1997) Tinnitus Cognitions Questionnaire: development and psychometric properties of a measure of dysfunctional cognitions associated with tinnitus. *The International Tinnitus Journal,* 4 (1), 23-30.

Xu, X., Bu, X., Zhou, L., Xing, G., Liu, C. and Wang, D. (2011) An epidemiologic study of tinnitus in a population in Jiangsu Province, China. *Journal of the American Academy of Audiology,* 22 (9), 578-585.

Yardley, L. (2000) Dilemmas in qualitative health research. *Psychology and Health,* 15 (2), 215-228.

Zigmond, A.S. and Snaith, R.P. (1983) The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica,* 67 (6), 361-370.

Zoger, S., Svedlund, J. and Holgers, K.M. (2001) Psychiatric disorders in tinnitus patients without severe hearing impairment: 24 month follow-up of patients at an audiological clinic. *Audiology,* 40 (3), 133-140.

Zvolensky, M.J., Goodie, J.L., Mcneil, D.W., Sperry, J.A. and Sorrell, J.T. (2001) Anxiety sensitivity in the prediction of pain-related fear and anxiety in a heterogeneous chronic pain population. *Behaviour Research and Therapy,* 39 (6), 683-696.