The phenomenology of nightmares in the context of psychosis, with a case series of imagery rescripting

Sheaves, Bryony

Awarding institution:
King's College London

Title: The phenomenology of nightmares in the context of psychosis, with a case series of imagery rescripting

Author: Bryony Sheaves

Volume I

Main Research Project

&

Service Related Research

Bryony Sheaves

Thesis submitted as partial fulfilment of the degree of
Doctorate in Clinical Psychology

Institute of Psychiatry

King's College London

May 2013

Main Research Project

The phenomenology of nightmares in the context of psychosis, with a case series of Imagery Rescripting

Supervised by:
Dr Juliana Onwumere
Professor Elizabeth Kuipers
Dr Nadine Keen

Acknowledgements

I would like thank my research supervisors, Dr Juliana Onwumere, Professor Elizabeth Kuipers and Dr Nadine Keen for first noting the problem of nightmares in people with symptoms of psychosis, for being so generous with their time and commitment and for teaching me such a great deal. It has been a privilege to work with you.

Particular thanks go to Juliana for providing expert supervision for the case series, above and beyond what I would have expected from a case series supervisor.

I am enormously grateful to the participants whose experiences form the basis of this thesis and the teams in South London and Maudsley NHS Foundation Trust and Oxleas NHS Foundation Trust, for facilitating with recruitment and receiving the project with such enthusiasm.

Thanks to the people who have made the past three years much more than just a learning experience; all the D Clin Psy cohort and particularly Dr Lorna Taylor and Claire Tobin. Finally, thank you to Tom, for support, encouragement and positivity.

Abstract

Introduction: Nightmares are a common problem recognised in Post-traumatic stress disorder (PTSD; Neylan et al., 1998) and Borderline personality disorder (Semiz, Basoglu, Ebrinc and Cetin (2008). In a healthy student sample, nightmare distress was positively correlated with paranoia and psychoticism (Levin & Fireman, 2002). However, nightmares have never been investigated in people with psychosis. Imagery Rehearsal (IR) has been effective in reducing the frequency of nightmares, improving sleep and symptoms of PTSD (Casement & Swanson, 2012), but again, has never been trialled in psychosis. ***Aims:*** Study A examined the prevalence of nightmares in those with psychosis, their link with sleep quality, psychotic, affective and cognitive symptoms. Study B investigated whether an IR protocol (IR; Nappi, Drummond, Thorp & McQuaid, 2010) might be suitably adapted for people with psychosis. ***Methods:*** Forty participants with psychotic symptoms completed a semi-structured interview to assess nightmares, sleep quality, severity of delusions, hallucinations, depression, anxiety, stress, global distress, PTSD, daily activities and working memory. Five participants completed 4-6 sessions of IR for nightmares (study B). ***Results:*** 55% of patients reported weekly distressing nightmares. Nightmare frequency was related to sleep quality, sleep efficiency and depression. More distressing nightmares were associated with worse delusions, depression, anxiety, stress and working memory. The case series demonstrated the feasibility of IR for the treatment of nightmares in those with psychosis; reductions in nightmare distress, vividness, intensity, affective and psychotic symptomatology were observed post-intervention. ***Conclusion:*** Nightmares are common in those with psychosis and impact on day and night time experiences. They may present a target for intervention. The cross sectional nature of study A and small, uncontrolled sample of study B present limitations to conclusions. Future research should aim to uncover the direction of causality between nightmares and daytime symptoms and further investigate IR as a nightmare specific intervention.

Table of Contents

List of Tables

List of Figures

List of Appendices

"A ruffled mind makes a restless pillow"
Charlotte Brontë

1. Literature Review

1.1 Overview

1.1.1 Introduction

The role of sleep and nightmares in mental health has received remarkably little attention in the scientific literature. Only in the last twenty years have empirical investigations taken place to look at the relationship between nightmares, sleep quality and clinical diagnoses, such as post-traumatic stress disorder (Neyla et al., 1998; Leskin, Woodward, Young & Sheikh, 2002; Krakow et al., 2000; Davis & Wright, 2007; Davis et al., 2011; Nappi, Drummon, Thorp & McQuaid, 2010) and borderline personality disorder (Semiz, Basoglu, Ebrinc & Cetin, 2008). The past five years has drawn attention to major sleep disruption in those with psychosis (Wilson & Argyropoulos, 2012; Afonso, Figuera & Paiva, 2013; Wulff, Dijk, Middleton, Foster & Joyce, 2012; Freeman, Pugh, Vorontsova & Southgate, 2009; Bromundt et al., 2011). However, the role of nightmares in those with a diagnosis of psychosis has not been considered. This study contributes to this new research area. The phenomenology of nightmares within the context of psychosis is described and a psychological intervention for the treatment of nightmares was adapted and piloted for those with psychotic symptoms in a small case series.

The literature review that follows is divided into three parts. The first section considers the classification, epidemiology and economic impact of psychotic disorders. The middle section of the review will justify the relevance of investigating nightmares in those with psychosis by considering the impact of sleep and nightmares on daytime functioning outside of psychosis literature. It will consider what is known already about sleep disturbance in those with psychosis and lastly, evaluate evidence indicating increased prevalence of nightmares in people with experience of psychosis. The third section of the literature review will evaluate evidence of the effectiveness of Imagery Rehearsal (IR) as a psychological intervention for nightmares and reviews what adaptations might be needed in order to evaluate the efficacy of this approach in those with psychosis.

1.1.2 Clarification of terms; schizophrenia, psychosis and positive symptoms

Schizophrenia is a diagnostic term used to characterise a condition where individuals can experience altered perception, thoughts, affect and behaviour (NCCMH, 2010). There is no single cause of schizophrenia but instead a range of biological, psychological and social factors can interact, to varying degrees, to trigger onset (NCCMH, 2010; The Schizophrenia Commission, 2012). Schizophrenia is most commonly diagnosed between the ages of 15 and 35 (NHS Choices, 2012). The course of the disorder is marked by three phases: the prodromal phase, the acute phase and the post-acute phase. The prodromal phase is characterised by anomalies of experience, deterioration in cognitive and social functioning. The acute phase is characterised by positive symptoms, such as hallucinations, delusions and interference in the flow of thoughts (Cowen, Harrison & Burns, 2012) and in the post-acute phase, positive symptoms might diminish or disappear but leave the person with residual symptoms similar to the prodromal period (NCCMH, 2010). Around 45% of people who receive a diagnosis of schizophrenia recover after one or more episodes, around 20% show unremitting symptoms and 35% show a mixed pattern of remission and relapse (Schizophrenia Commission, 2012).

Whilst schizophrenia is a diagnostic term widely used in healthcare settings, the clinical and research value of 'schizophrenia' as a discreet diagnostic entity has been bought under much scrutiny (Bentall, 2003). There is evidence to suggest that those with a diagnosis of schizophrenia do not share the same aetiology, symptomatology or response to treatment (Bentall, 2004). Instead a factor analytic study has found that those with schizophrenia hold three separate symptom clusters: positive symptoms (hallucinations and delusions), negative symptoms (including for example avolition and affective flattening) and disorganised thinking (Andreasen, Arndt, Alliger, Miller & Flaum, 1995). Rather than referring to specific diagnostic criteria, the term 'psychosis' follows a more specific and straightforward definition: 'the inability to distinguish between subjective experience and external reality, as shown by the presence of delusions or hallucinations' (Cowen et al., 2012, p.27). The term psychosis therefore refers to an experience that is found in diagnoses such as schizophrenia, organic and affective disorders. It is this more specific experience, found across a range of disorders that is the subject of this investigation.

1.1.3 Psychosis; epidemiology and impact

With regards to incidence of psychosis, a recent systematic review reported that the pooled incidence of psychosis in England was 32 per 100,000 person years (Kirkbride et al., 2012). This incidence is split relatively evenly between schizophrenia and affective psychoses (Kirkbride et al., 2011). Whilst incidence has not changed over time (1950-2009), incidence rates vary substantially across age, sex, place and migration status / ethnicity (Kirkbride et al., 2012), as well as by urbanicity (McGrath et al 2004).

Experience of psychosis is associated with a range of poor functional outcomes including small social networks (Sundermann, Onwumere, Bebbington & Kuipers, 2012), increased risk of suicide (Palmer, Pankratz & Bostwick, 2005) and low employment rates (Marwaha & Johnson, 2004; Thornicroft et al., 2004; Bebbington et al., 2005). Those with psychosis experience a range of poor physical health outcomes such that life expectancy is reduced by 15-20 years when compared with other citizens and 87% report experience of stigma or discrimination (Henderson et al., 2012). In addition, caring for a person with psychosis is related to increased risk of clinically significant anxiety and depression (Kuipers, Onwumere & Bebbington, 2010; Dyck, Short & Vitaliano, 1999; Boydell et al., 2013). Schizophrenia and affective psychosis combined cost the UK economy £13.8 billion per year, largely attributable to lost employment and health service costs (Kirkbride et al., 2011).

An improved understanding of the sleep experiences of those with psychosis, their links with daytime symptomatology and functioning, together with the possibility of new interventions for these difficulties, has the potential for clinical, social and economic impact.

1.2 Study A: the phenomenology of nightmares in the context of psychosis

1.2.1 What is sleep and why is it relevant to mental health?

Sleep and wakefulness are behavioural and neurobiological states experienced by all human beings and mammals (Lockley & Foster, 2012). Adult humans currently sleep for an average duration of seven hours per night although some historical accounts suggest that in pre-industrial times people slept for up to ten hours per day, dependent on the season (Lockley & Foster, 2012). Industrialisation has caused more rigid working schedules and the

introduction of electric lighting in the nineteenth century reduced the need for sleep to be so closely tied to the 24 hour light dark cycle (Lockley & Foster, 2012). These changes, in addition to slow progress in elucidating the purpose of sleep, have left it as an undervalued phenomenon and our treatment of it has been considered "brutish" (Lockley & Foster, 2012, p.2). This chapter proceeds to assert the importance of sleep processes in general and in particular demonstrate the relevance of studying nightmares in those with psychosis.

The structure of sleep is made up of two separable states; rapid eye movement (REM) sleep and non-rapid eye movement (NREM) sleep (see figure 1). Polysomnography (recordings of brain activity, eye movements and muscle tone) data suggest that the NREM sleep state is further divided into four stages of increasing depth: stage 1 (light sleep), stage 2 (consolidated sleep) and stages 3 and 4 (deep or slow wave sleep) (Lavie, Pillar & Malhotra, 2002). Polysomnography has revealed a consistent pattern of sleep across the night. First, humans enter sleep through NREM stage 1, quickly followed by NREM stage 2, followed by stages 3 and 4 (deep, slow wave sleep). After entering deep sleep, sleep decreases in depth back through stages 2 and 1 and then enters a brief period of REM sleep (5-10 minutes). The duration of this first cycle lasts approximately one and half hours (Bosch & van den Noort, 2008). This cycle is repeated throughout the night, however the REM sleep periods become longer and the depth of sleep decreases (Bosch & van den Noort, 2008).

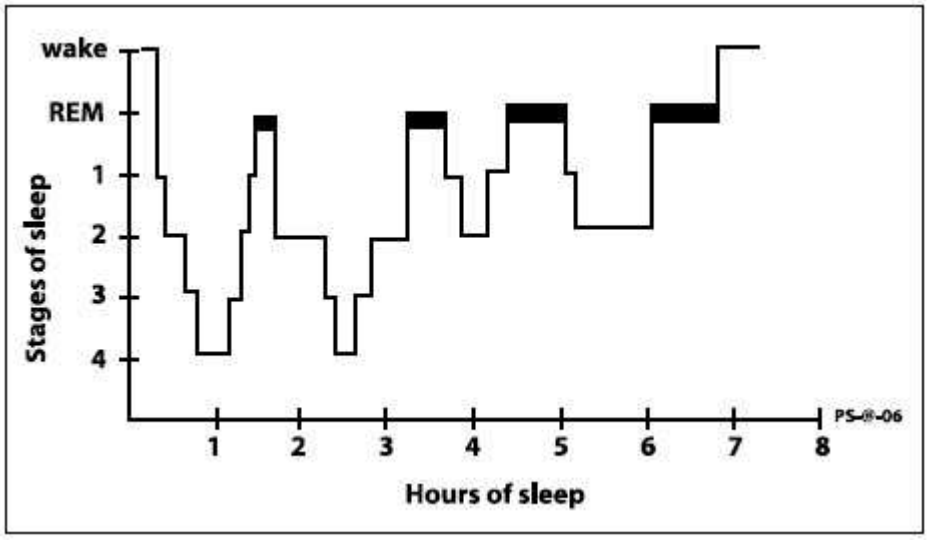

Figure 1. A hypnogram illustrating normal sleep cycles for adult humans (from Suwanprathes, 2006, p.671)

REM sleep occupies approximately 25% of total sleep time (Lockley & Foster, 2012), is characterised by quick movement of the eyeballs under the eye lids, an inhibition of skeletal muscles and is the period in which most realistic dreams occur (Bosch & van den Noort, 2008). Although dreaming can occur in both NREM and REM sleep, dreams in REM sleep tend to be longer, more vivid, complex and bizarre (Lockley & Foster, 2012). The state of dreaming spans the majority of REM sleep and as much as 40% of NREM sleep (Lockley & Foster, 2012). Recent hypotheses for the role of dreaming include that it serves as an emotion regulator (Desseilles, Dang-Vu, Sterpenich & Schwartz, 2010; Gujar, McDonald, Nishida & Walker, 2011; Nielson & Levin, 2007) and helps to consolidate emotional memories (Desseiles et al., 2010; Nishida, Pearsall, Buckner & Walker, 2009).

The past two decades have offered insights into the relevance of REM sleep and dreaming to a range of clinical diagnoses. The main focus has been that of depression in which research has shown a shortening of REM sleep latency, a lengthening of the first REM period and heightened density of REM sleep (Berger & Riemann, 1993). Further to this, it has been demonstrated that shortening the duration of the REM period by awakening the patient for a period of three weeks has an anti-depressant effect akin to pharmacological treatments (e.g. Imipramine treatment; Berger & Riemann, 1993). This finding suggests a direct impact of REM sleep length on mood.

Those with Borderline Personality Disorder (BPD) have an increase in REM density and reduced REM latency (Semiz, Basoglu, Ebrinc & Cetin, 2008). However, in addition, BPD patients show increased sleep fragmentation, negatively toned dreams and nightmares when compared to healthy controls, irrespective of posttraumatic stress disorder (PTSD) diagnosis (Semiz et al., 2008). For people diagnosed with PTSD (who often complain of nightmares), despite subjective complaints of nightmares and insomnia, objective measures via polysomnography demonstrate only small changes in NREM sleep (Van Liempt et al., 2013). These results highlight the importance of REM sleep and dreaming to the presentation of a range of mental health disorders.

1.2.2 Nightmares; evidence from the general population

Nightmares are the most common form of parasomnia (Levin & Fireman, 2002), characterised by awakening from rapid eye movement sleep with recollection of disturbing mental activity (Nielson & Levin, 2007). The Diagnostic and Statistical Manual for Mental Disorders, fourth edition (DSM-IV, American Psychiatric Association (APA), 2000) outlines the criteria for Nightmare Disorder: repeated awakenings from either major sleep or naps, with detailed recall of frightening dreams that usually involve threats to survival, self esteem or security. The DSM-IV suggests that the nightmares ordinarily occur in the second half of sleep, in line with their predominant formation in REM sleep. Nightmares are distinguished from night terrors on the basis that the person is rapidly oriented and alert. The person with Nightmare Disorder (according to DSM-IV) should experience clinically significant distress or impairment in functioning. Lastly, the DSM-IV rules out that nightmares are explained by the physiological effects of a substance, nor diagnoses such as delirium or PTSD (APA, 2000). Despite this definition, much of the research to date investigates nightmares as an individual entity rather than considering diagnostic criteria for Nightmare Disorder.

Krakow (2006) carried out a retrospective case review of patients entering two American community sleep facilities. He revealed that 26% of the sample (n=718) who were asking for help with sleep problems, ranked nightmares as a relevant sleep problem and 16% of the total sample were deemed to have a clinically significant nightmare condition (Krakow, 2006). Krakow (2006) reports that all participants complained of at least one other sleep problem, in fact 91% ranked two or more other sleep conditions in addition to nightmares and 64.64% agreed or strongly agreed that their nightmares disrupted their sleep. It is

clear that nightmares are both a relevant and common problem. Indeed Krakow (2006) argued that nightmares should be considered co-morbid with other disorders rather than subsumed as a symptom of other disorders and called for focussed nightmare treatments as adjunctive therapy.

The majority of studies that have reported prevalence of nightmares come from outside of the United Kingdom (UK). Li, Zhang, Martin and Wing (2010) report that 5.1% of a large community based cohort of middle-aged Hong Kong Chinese (n=8,558) experienced at least weekly nightmares. Female sex, low monthly income, measures of sleep disturbance and sleep related daytime consequences were all positively associated with nightmare frequency. Nielson and Levin (2007) reviewed large epidemiological surveys to report that between 2-6% of people experience weekly nightmares, consistent with results from Li et al., (2010). Janson et al. (1995) report the prevalence of nightmares in young adults in four European cities across Iceland, Sweden and Belgium. Participants were selected at random (n=2,202) from the European Community Respiratory Survey. Weekly nightmares were reported in 0.9-6.8% of participants across the four locations, broadly in line with figures reported by Nielson & Levin (2007) and Li et al. (2010). Summarising the results of non-UK based studies, the prevalence of weekly nightmares lies between 0.9-6.8% in the general population.

The only UK based study has been conducted by Blagrove, Farmer and Williams (2004), in Swansea, Wales. Participants (n=147) were recruited from members and associates of a university, 42% of whom reported experiencing at least one nightmare over a two week period via prospective nightmare logs. It is difficult to ascertain how the results reported by Blagrove et al. (2004) compare with those of the former studies given that they use a two week reference period, as opposed to a week's duration. In addition, it is possible that the sample might have been biased by inclusion criteria specifying that participants had to have recalled at least one dream per month. Never the less the results gain importance due to the fact that it is the only UK study.

1.2.3 The impact of nightmares on functioning

Krakow (2006) reports that of those entering a sleep facility, people suffering with a clinically significant nightmare condition showed a consistent pattern of worse mental and physical health outcomes compared with sleep disordered controls. These outcomes

included for example, a mood disorder, indigestion or rheumatic conditions (Krakow, 2006). The severe impact of nightmares on daytime functioning is most highlighted by a recent meta-analysis of the association between nightmares and suicide by Pigeon, Pinquart and Connor (2012). Pigeon et al. (2012) report that sleep disturbance in general, as well as nightmares and insomnia specifically, represent a risk factor for suicidal thoughts and behaviour. Interestingly, these associations were not moderated by mood (Pigeon et al. 2012). With regards to possible mechanisms for the link between nightmares and suicidality, two hypotheses can be posited; a role of increased hopelessness that has been found in those with frequent nightmares (Agargun et al., 1998) and / or a role of decreased emotion regulation and emotional problem solving following disruption of usual dreaming processes (Nielson & Levin, 2007; Desseilles et al., 2010).

Nightmares have recently been demonstrated to impact more widely on sleep architecture. Simor, Bodizs, Horvath and Ferri (2013) report that nightmares disrupt NREM sleep architecture, even on nights when the person does not experience a nightmare. This result remained significant after controlling for depression and anxiety symptoms. Simor et al., (2013) hypothesise that this might result from a more global (and nightmare independent) imbalance in arousal mechanisms during sleep. This suggests that nightmares disrupt sleep processes even on nights when the sufferer is in fact asymptomatic of nightmares.

Levin and Fireman (2002) carried out a prospective study of nightmare prevalence and distress in a cohort of students and explored their respective links with daytime functioning. Of interest to the current investigation is that nightmare frequency was significantly related to paranoia, whilst nightmare distress was significantly related to both paranoia and psychoticism, measured using the Symptom Checklist-90-Revised. Nightmare frequency and nightmare distress were not significantly correlated and it was nightmare distress (rather than frequency) that accounted for much of the unique explanatory variance in predicting interpersonal sensitivity, paranoia and affective states (depression and anxiety). These results would lead one to speculate nightmares to be more prevalent in a clinical population with psychosis and furthermore suggest that it would be distress rather than prevalence of nightmares that best accounts for the link between night and daytime pathology. The importance of distress is consistent with other phenomena, such as voice hearing.

1.2.4 Nightmares in other clinical populations; Insomnia, PTSD and Borderline Personality Disorder

This section will outline research to date that has investigated nightmares, within the context of other psychiatric disorders; Primary Insomnia, PTSD and BPD. Ohayon, Morselli and Guilleminault (1997) investigated nightmares within a sub-sample of 1,049 people with Primary Insomnia who responded to a general population survey. Results indicated that 18.3% of participants suffered with DSM-IV diagnosed nightmares. Nightmares were associated with increased nocturnal awakenings, increased sleep onset, daytime memory impairment following poor nocturnal sleep, daytime anxiety and female gender (Ohayon et al., 1997). Within the psychosis literature there are well documented findings of memory impairment (Aleman, Hijman, de Haan & Kahn, 1999) increased sleep latency and nocturnal awakenings (Afonso, Figueira and Paiva, 2013) and a high prevalence of insomnia in those with persecutory delusions (Freeman, Pugh, Vorontsova & Southgate, 2009). Given the parallel findings between research investigating nightmares in those with insomnia (but without psychosis) and the cognitive and sleep attributes of those with psychosis, it would seem important to investigate the experience of nightmares within a psychosis population.

Nightmares are well recognised within the clinical presentation of PTSD such that they are included in diagnostic criteria (DSM-IV, APA, 2000; ICD-10, WHO, 2010). With regards to prevalence of nightmares in those with PTSD, data from the National Vietnam Veterans Study (Neylan et al., 1998) found that 52% of participants reported nightmares 'sometimes, or more frequently'. Leskin, Woodward, Young and Sheikh (2002) reported 71% of participants with PTSD complained of nightmares (though it is unclear how frequently), whilst the prevalence of those with PTSD and co-morbid Panic Disorder who complained of nightmares was significantly higher (96%). This suggests that nightmares might be closely tied to difficulties in processing traumatic events.

Nightmares have recently been investigated in a sample with Borderline Personality Disorder (BPD). Semiz et al. (2008) compared 88 people with BPD to age and sex matched controls. Results indicated that 49% of those with BPD suffered from DSM-IV diagnosable nightmare disorder in comparison to 7% of the healthy control group. The BPD group also indicated significantly higher dream anxiety and disturbed sleep quality. Dream anxiety in particular was related to early traumatic experiences, dissociative symptoms and sleep quality. Furthermore, those in the BPD group diagnosed with nightmare disorder displayed more severe clinical characteristics than those with BPD without nightmare disorder.

These included substance abuse, suicide attempts, other self harm methods and duration of self harm (Semiz et al., 2008). It is clear from the results of Semiz et al. (2008), in addition to studies investigating nightmares in the context of PTSD and insomnia that nightmares occur more frequently in these clinical populations than in the general population and furthermore, have implications for severity of daytime symptoms.

1.2.5 What is already known about sleep and psychosis?

Investigation of sleep disturbance in psychosis has been a rapidly growing research area over the past five years. Sleep disturbance is now considered a common feature in the presentation of the disorder and a risk factor for developing psychosis in those at high risk (Ruhrmann et al., 2010). The following review will outline disruptions in circadian rhythm and sleep architecture, found in those with a diagnosis of schizophrenia.

Afonso, et al. (2013) characterised sleep patterns in 34 participants with schizophrenia in comparison to 34 healthy controls, using wrist actigraphy and sleep diaries. Results indicated that despite patients with a diagnosis of schizophrenia going to bed earlier and waking later than healthy controls, their overall sleep quality was poorer and was characterised by higher sleep latency and more night time awakenings. Wulff, Dijk, Middleton, Foster and Joyce (2012) found similar sleep disruption in all of their twenty participants with schizophrenia. They found more variability in the timing of sleep onset and offset and the sleep midpoint in those with schizophrenia. Crucially, the comparison group in the study by Wulff et al., (2012) were all unemployed in order that lack of daytime structure was kept relatively constant across groups. This suggests that sleep disruptions in the schizophrenia group are not accounted for by lack of structured daytime activity. In addition, these differences were not explained by anti-psychotic medication dose.

Wulff et al. (2012) found two distinct sleep profiles in those with schizophrenia. In group one, participants' sleep patterns were not aligned to the day/night cycle, they exhibited lower melatonin sulphate levels (a hormone secreted by the pineal gland which synchronizes circadian rhythms), slept for longer hours than controls and were less active when awake. Those in the second group exhibited a usual sleep onset time and regular melatonin sulphate levels, yet sleep was prolonged, irregular or fragmented (Wulff et al., 2012). It is plausible that distressing nightmares, might account (at least in part) for the

irregular and fragmented pattern, particularly in group two, yet no research to date has reported on nightmares in those with schizophrenia.

1.2.6 Sleep structure and psychosis; link with daytime symptomatology

Although sleep disturbance is a clinically important phenomenon in and of itself, the relevance of researching sleep disturbance in those with psychosis is also important because of its links with daytime symptoms. The following section will report on three studies linking insomnia with paranoid thinking (Freeman et al., 2012a; Freeman et al., 2009 & Myers, Startup & Freeman, 2011). Following this, the link between sleep disturbance and frontal executive functioning will be described.

Freeman et al. (2012a) report longitudinal analysis from the British National Psychiatric Morbidity Survey including 2,382 participants. These participants completed a baseline assessment and were selected for a follow up assessment based on presence (or high risk) of a mental health disorder. Critically, insomnia was a predictor of both new inceptions and persistence of paranoia at 18 month follow up (Freeman et al., 2012a). An earlier study by Freeman et al. (2009) indicated that higher levels of insomnia were associated with higher levels of paranoia in the general population and additionally, that moderate to severe insomnia was present in over half of those with persecutory delusions attending psychiatric services. Myers et al. (2011) piloted a CBT intervention for insomnia with 15 participants with persistent persecutory delusions. Provision of this four session intervention resulted in large significant reductions in levels of insomnia and persecutory delusions that were maintained at one month follow up. This data provides experimental data demonstrating how an intervention which resulted in improved sleep also impacted upon psychotic symptoms.

1.2.7 Sleep structure and their link with cognitive deficits

Cognitive deficits are now considered a central feature of schizophrenia (Bowie & Harvey, 2006) appearing in 75-85% of patients to a varying degree (Kayman & Goldstein, 2012). The largest cognitive changes often occur prior to first episode of psychosis; however non-significant cognitive changes have been reported to be observed as far back as primary school (Kayman & Goldstein, 2012). Cognitive deficits have recently been summarised into six domains: speed of processing, attention/vigilance, working memory, verbal learning and memory, visual learning and memory, and reasoning and problem solving (Nuechterlein et

al., 2004). Studies have shown that cognition is the best predictor of functional status in psychosis across a range of outcome domains and patient characteristics (Bowie & Harvey, 2006) and an important attribute of clinical presentation.

Bromundt et al. (2011) measured sleep wake cycles and cognitive functioning in 14 participants with schizophrenia. They report much variability in sleep wake patterns, similar to that reported by Wulff et al. (2012). In addition, they found that participants with a normal rest-activity cycle (determined by amplitude of day to night time activity) performed significantly better on frontal executive neuropsychological tasks (Bromundt et al. 2011). Indeed, age and rest-activity cycle of the participant proved to be the best predictors of frontal executive task performance. Positive and negative symptoms of schizophrenia in comparison did not correlate with either cognitive performance nor sleep-wake cycles. This study highlights the importance of circadian rhythm in cognitive functioning over and above the contribution of other symptoms.

Disruptions in sleep architecture and in particular the sleep spindles (bursts of brain activity measurable through electroencephalography; EEG) which exist in stage 2 sleep, have been linked to particular domains of cognitive functioning in schizophrenia. Ferrarelli et al. (2010) report that sleep spindles are reduced in amplitude and duration in participants with schizophrenia when compared to both matched controls and non-schizophrenia patients taking anti-psychotic medication. Keshavan et al. (2011) report reduced spindle density to correlate with impaired attention and reasoning, but not intelligence quotient in anti-psychotic naive newly diagnosed patients with psychosis. Wamsley et al. (2012) report that patients with schizophrenia showed reduced spindle number and density, which predicted less overnight improvement in a procedural memory (finger tapping) task. Furthermore, attributes of the spindle waves correlated with greater severity of positive symptoms of psychosis. The above three studies combined suggest that neurological attributes of stage two sleep might account for at least some of the cognitive deficits evident in those with schizophrenia, as well as link with positive symptoms.

1.2.8 Why might nightmares be more prevalent in those with psychosis? The role of unusual perceptions and the overlap between day and night.

One account for the link between psychosis and nightmares is that they share similar aetiological pathways. In a review of the literature, Koffel and Watson (2009) draw on

several lines of research linking nightmares to unusual perceptual experiences during the day. Firstly, they note a high incidence of schizophrenia spectrum diagnoses and schizotypal personality disorder in people reporting frequent nightmares. Secondly, Koffel and Watson (2009) report nightmares to be related specifically to measures of dissociation and schizotypy, rather than depression and anxiety more generally. Lastly, by dichotomising participants into high and low frequency nightmare groups they report that those with high frequency nightmares score significantly higher on measures of schizotypy. This evidence, drawn from both clinical and non-clinical groups is used to add weight to Koffel and Watson's argument that unusual cognitions and perceptions overlap between daytime and night time functioning and therefore represent a common domain with shared aetiology.

1.2.9 Does the experience of trauma increase risk for nightmares in those with psychosis?

A second line of research links nightmares with psychosis via trauma. Psychological trauma has been defined as the experience of an uncontrollable event which is perceived to threaten a person's sense of integrity (Horrowitz, 1986). A growing body of research has emphasised the very high prevalence rates of trauma in people with psychosis, in both childhood (between 50-78%; Holowka, King, Saheb, Pukall & Brunet, 2003; Read, Goodman, Morrison, Ross & Aderhold, 2004; Greenfield, Stratowski, Tohen, Batson, Kolbrener, 1994) and adulthood (68-100%; Shaw, McFarlane, Bookless & Air, 2002). Neria et al. (2002) for example report the prevalence of trauma exposure to be 68.5% in a cohort experiencing their first hospital admissions for psychosis. A sub-group of 26.5% of this trauma exposed group met criteria for PTSD. A more recent study followed children who were exposed to the South Australian bush fires of 1983 and measured outcomes 20 years post-trauma (Galletly, Hooff & McFarlane, 2011). Although exposure to this one trauma was not found to be associated with psychosis, overall lifetime exposure to trauma, high rates of childhood adversity and dysfunctional parenting were associated with sub-clinical psychotic experiences in this sample.

Childhood sexual abuse has been implicated as a trauma particularly associated with the onset of later psychosis. In a survey, Morrison, Frame and Larkin (2003) report that 34-53% of patients with severe mental illness report childhood sexual or physical abuse. A more recent study by Bebbington et al. (2011) utilised a large representative general population sample of 7353 English adults to highlight a strong association between sexual abuse prior

to age 16 and later psychosis. It must of course be considered that childhood sexual abuse is a particularly extreme childhood trauma; not only is the trauma itself severe but often if abuse occurs within the family, one would expect family processes to be severely disrupted. It is clear that there is an association between trauma and psychosis, but that it is often severe or repeated trauma, in the context of poor parenting that provides the clearest link.

Coentre and Power (2011) suggest a high incidence of co-morbidity between psychosis and post traumatic stress disorder (PTSD), reporting the prevalence of PTSD in patients with severe mental illness to be at least three times higher than the general population. A recent study by Freeman et al., (2013) revealed that almost all the same cognitive factors during and after an assault predicted both paranoia and PTSD in a non-clinical population who presented at accident and emergency departments. This study revealed that despite paranoia and PTSD being correlated, they were distinct experiences. Morrison Frame and Larkin (2003) conceptualise trauma within psychosis by suggesting that the differential experience of PTSD versus psychosis lies within the interpretation assigned to the intrusive reactions to the trauma. Given the clear links between psychosis, trauma and PTSD, and the prevalence of nightmares in those with post-traumatic reactions, it would be reasonable to assume a higher prevalence of nightmares in those with psychosis. The frequency of nightmares in psychosis has however not been investigated.

1.2.10 Sleep and pharmacological treatment

Anti-psychotic medication is recommended as the fist line treatment for those with a diagnosis of schizophrenia in the UK (NICE 2009, NCCMH, 2010). Examination of the impact of anti-psychotics on dreaming and nightmares is in its infancy, however two studies report that particular anti-psychotics might impact on dreaming. Bretang-Norris and Alexander (2012) report two case reports, the first implicates the anti-psychotic Risperidone on increased nightmare frequency via an A-B-A design. The second report utilises the same design to comment on the increased frequency of nightmares when medication management was altered from Risperidone and Sodium Valproate to Quetiapine and a further cessation of nightmares when medication was switched to a further anti-psychotic: Ziprasidone. These two case studies should be interpreted with caution. Risperidone for example has been indicated to decrease post-traumatic nightmares in other studies

(Escamilla, LaVoy, Moore & Krakow, 2012). Even so, from the available literature, the possible effects of anti-psychotic medications on nightmares should be held in mind.

1.2.11 Summary, aims and hypotheses:

Psychosis is a severe mental health condition that is commonly associated with high levels of morbidity. Nightmares are a common problem for a range of other diagnoses including PTSD, BPD and insomnia, associated with poor sleep and worse daytime symptoms. This study aims to explore the frequency and impact of nightmares in the context of psychosis.

Evidence from existing community samples from outside of the UK have indicated the prevalence of weekly nightmares to lie between 0.9-6.8%. The only UK based study indicated 42% of participants experienced one nightmare over a two week reference period. Evidence suggests that the prevalence of nightmares in those with psychosis will be significantly higher than rates in community samples for a number of reasons:

1. Nightmare frequency is related to measures of paranoia (Levin & Fireman, 2002) and schizotypy (Koffel & Watson, 2009) in non-clinical samples.
2. Those with schizophrenia have been shown to have irregular / fragmented sleep (Wulff et al., 2012) and more night time awakenings (Afonso et al., 2013). As such, moderate to severe insomnia has been found in over half of those with persecutory delusions (Freeman et al., 2009). Nightmares are more prevalent in samples with insomnia than the general population (Ohayon et al., 1997), leading one to speculate that nightmares may account for at least some insomnia symptoms.
3. Trauma histories are prevalent in those with psychosis (Neria et al., 2002) and particularly severe trauma such as childhood sexual abuse (Bebbington et al., 2011). Nightmares are prevalent in populations with trauma histories such as those with PTSD (Leskin et al., 2002) and BPD (Semiz et al., 2008).

Hypothesis one:

Nightmares will be more prevalent in the context of psychosis than in the general population.

Hypothesis two:

Evidence suggests that nightmares result in increased time to fall asleep and increased nocturnal awakenings (Ohayon et al., 1997; Semiz et al., 2008). *Hypothesis two therefore states: Nightmare frequency will be correlated with measures of sleep. A positive correlation is expected between overall sleep quality (measured by the Pittsburgh Sleep Quality Index; PSQI) and nightmare frequency (higher scores on PSQI indicate worse sleep quality). A negative correlation is expected between nightmare frequency and sleep efficiency.*

Hypothesis three:

Koffel and Watson (2009) maintain that daytime and night time functioning represent a common domain, with shared aetiology. On this basis, the *third hypothesis states: nightmare frequency will be correlated with measures of daytime symptomatology including severity of delusions, auditory hallucinations and severity of affective symptomatology (PTSD, depression, anxiety, stress and global distress).*

Hypothesis four:

It has been shown in a student sample that it is nightmare distress rather than nightmare frequency that best accounts for variance in daytime paranoia and affective symptomatology (Levin & Fireman, 2002). This evidence forms the basis of *hypothesis four: Nightmare related distress better accounts for the disturbance in daytime psychological functioning and daytime activity than nightmare frequency.*

Hypothesis five:

Following the results of Levin and Fireman (2002) *hypothesis five states that: Nightmare frequency and nightmare distress will exert independent effects on measures of sleep and daytime psychiatric symptomatology.*

Hypothesis six:

Sleep quality has been shown to impact on daytime cognitive functioning (Bromundt et al., 2011; Keshavan et al., 2011; Wamsley et al., 2012). *Hypothesis six states that overall sleep quality will be negatively correlated with working memory. Furthermore it is expected that nightmare frequency will be negatively correlated with working memory.*

1.3 Study B: Development of a psychological intervention for nightmares in the context of psychosis

1.3.1 Psychological interventions for psychosis

In comparison to other psychiatric disorders such as depression and anxiety, psychological interventions for psychosis have developed relatively recently. This is largely because of earlier thinking that schizophrenia is biologically determined and therefore not amenable to traditional psychological therapy (Tarrier, 2005). There is now much supportive evidence for the central role of emotional, cognitive and social environmental processes in psychological models of psychosis (Kuipers et al. 2006). As such the past twenty years has seen the development of Cognitive Behaviour Therapy for psychosis (CBTp) and the publication of several treatment manuals (Chadwick, Birchwood & Trower, 1996; Fowler, Garety & Kuipers, 1995; Laroi & Aleman, 2010). A recent meta-analytic review has suggested CBTp has a modest effect on positive symptoms of psychosis (0.37), negative symptoms (0.44), functioning (0.38) and mood (0.36) (Wykes , Steel, Everitt & Tarrier, 2008) and is therefore recommended as an adjunct to medication in the UK National Institute of Clinical Excellence Guidelines for Schizophrenia (NICE, 2009). For the purpose of the current investigation it is helpful to consider the elements of CBT therapy that are more unique to psychosis, in order to consider techniques required for the successful implementation of a psychological treatment for nightmares.

Tarrier (2005) lists a range of psychosocial factors which impact on the nature and delivery of a CBT type of intervention for those with psychosis. These include for example restricted attention, elevated arousal, co-morbidity, high risk of suicide, risk of victimisation and restricted social networks (Tarrier, 2005). As a means of accounting for variability in these factors, Fowler et al. (1995) recommend a highly individualised therapeutic approach, incorporating a degree of flexibility in for example the number and length of sessions. In delivering CBTp it is recommended that the therapist be sensitive to the difficulties in building and establishing a working relationship that may be caused by, for example, voices commanding the patient to kill the therapist, or beliefs that the therapist might be part of a conspiracy (Fowler et al., 1995). It is clear that an intervention for nightmares in the context of psychosis should include evidence based components, (as defined by NICE 2009), but deliver them through flexible means in order to meet the individual needs of those with psychosis.

1.3.2 Imagery techniques for the treatment of daytime intrusive images:

The use of imagery and the technique of manipulating imagery for positive effect can be dated back over 20,000 years (Arntz, 2012). It is only more recently during the late 20th and early 21st century that imagery rescripting has gained empirical support as a transdiagnostic tool for the treatment of distressing imagery in clinical populations (Holmes, Arntz & Smucker, 2007). Imagery rescripting is a technique that utilises the imagination in order to re-experience sensory detail from an emotional memory or image as if it is occurring in the present moment. This image is evoked in much sensory detail following which the person changes the image or memory in order that it follows a more emotionally positive or neutral ending.

Imagery rescripting has a strong evidence base as a trans-diagnostic therapeutic technique (Arntz, 2012) and as such forms part of treatment packages of Cognitive Therapy for PTSD (Ehlers & Clark, 2000; Ehlers, Clark, Hackman, McManus & Fennel, 2005; Arntz, 2012), Social Phobia (Clark et al., 2006; Arntz, 2012) and Schema Therapy for personality Disorders (Young, Klosko & Weishaar, 2003; Arntz & Van Genderen, 2009; Arntz, 2012). Preliminary studies suggest that it can also be adapted for use in treatment of specific phobia, obsessive compulsive disorder, depression, bullimia nervosa and in health psychology populations (Arntz, 2012). The evidence base for imagery rescripting as applied to the treatment of nightmares will be discussed in detail later. Despite impressive outcomes in clinical populations, an evidence base for the underlying mechanisms is currently lagging behind that of effectiveness trials and as such it has recently been deemed “a technique in need of a theory” (Arntz, 2012, p. 200).

1.3.3 Why are imagery techniques well suited to the treatment of nightmares?

The use of imagery within psychological therapy might be of particular benefit to the treatment of nightmares. Holmes and Matthews (2010) assert that mental imagery is relevant to psychopathology due to its special relationship with emotion. In particular they suggest that mental imagery evokes a greater emotional response than verbal representations. Given that nightmares in particular are associated with much sensory detail, it makes sense therapeutically to address such a phenomenon via imagery. Brewin, Gregory, Lipton & Burgess (2010) propose a model of intrusive imagery set within the context of cognitive neuroscience. Brewin et al. (2010) theorise that intrusive images represent low level sensory and affectively charged memory representations as opposed to

more abstract declarative representations that are more easily accessed verbally. It is therefore intuitive to consider imagery techniques for the treatment of nightmares as opposed to relying solely on the verbal system.

The model of intrusive imagery set out by Brewin et al. (2010) sits well with recent brain imaging studies of REM sleep which suggests that dreaming states are supported by low level sensory neural processing. Imaging studies have evidenced increased activation of sensory areas of the brain including the visual and motor cortices during REM sleep whilst conversely indicating a decrease in activation in areas supporting attention and frontal executive abilities (Desseilles, Dang-Vu, Sterpenich & Schwartz (2011). Desseilles et al., (2011) link these data with reports from dream data that suggest much sensory detail but with disruption in more frontally mediated cognitive processes such as the lack of control over dream events and the unquestioning acceptance of bizarre events during dreams. It is intuitive to use a sensory approach to work therapeutically with a sensory problem, rather than relying solely on higher level cognitive processes.

1.3.4 Imagery Rehearsal (IR) as a nightmare specific intervention:

Nightmares have previously been subsumed as a symptom of PTSD, rather than a co-morbid disorder in and of itself. In fact, whilst posttraumatic nightmares are a key feature of PTSD, they are frequently resistant to standard PTSD treatments (Gehrmann & Harb, 2010). Imagery Rehearsal (IR) techniques are the only nightmare specific treatment demonstrated as efficacious in randomised controlled trials by separate research teams. Whilst different protocols exist, the basic elements of IR include a psychoeducation phase, rescripting a change of ending to the nightmare and daily imaginal rehearsal of the new dream narrative (Casement & Swanson, 2012). IR therefore utilises imagery rescripting techniques, but imbedded within psychoeducation and rehearsal of the new script. It should be noted that the terms imagery rehearsal and Imagery Rehearsal Training (IRT) are used interchangeably within the literature to refer to the same basic method.

Krakow et al. (2000) were the first to publish a randomised control trial of IR for the treatment of post-traumatic nightmares in sexual assault survivors with PTSD. The protocol used was a three session group therapy format delivered over five weeks. The intervention included psycho-education, CBT techniques for dealing with images, creating an alternative ending for a chosen nightmare via a written script and imaginal rehearsal of the new script.

Following the intervention, the results highlighted that nightmare frequency significantly decreased, PTSD symptoms decreased and sleep quality improved in comparison to the wait list control group, who evidenced minimal changes in the above measures (Krakow et al., 2000). This early study revealed promising results for the efficacy of a nightmare specific intervention for PTSD sufferers.

Since the first study of Krakow et al. (2000) several studies have used IR as an intervention for nightmares. All the reported studies share similar components; psycho-education, creating a re-script for a target nightmare and using imaginal rehearsal of the new script. However different protocols have evolved. Some protocols emphasise the importance of an additional exposure and relaxation component to the rescripting of the nightmare (Davis & Wright, 2007; Davis et al., 2011). Through this method Davis & Wright report that 84% of their trauma exposed adults with nightmares achieved a week long absence of nightmares at six months follow up. In addition improved sleep quality and quantity, depression and PTSD symptoms were reported. Davis et al. (2011) replicated the findings of Davis and Wright (2007) in addition to marking treatment related improvements in physiological reactivity including heart rate, skin conductance and corrugator activity (muscle surrounding the eyebrow). These studies indicate that imagery re-scripting of a nightmare, in addition to exposure and relaxation results in changes in both psychological and physiological markers of nightmare severity.

Other studies have suggested that rescripting is more acceptable to both patients and therapists than exposure and results in significantly lower dropout rates (Arntz, Tiesema & Kindt, 2007). As such, Nappi, Drummond, Thorp & McQuaid (2010) utilised IR in the absence of an exposure element but substituted this with practicing guided imagery of a pleasant scene and emphasise compliance with a rehearsal schedule. Participants chose their target nightmare, 85% of which related to an event occurring during military service. The intervention was formed of 4-5 sessions in a group or individual format, depending on time constraints of the participant. Participants were guided to change the ending of the nightmare to a neutral or pleasant ending and to elaborate this ending in order that it was vivid and detailed. Participants then practiced this rescripted nightmare twice daily for ten minutes. Results indicated significant reductions in nightmare frequency and intensity, severity of insomnia and subjective daytime PTSD symptoms.

With regards to longer term follow up of participants, Forbes et al. (2003) found significant improvements in nightmare frequency and intensity 12 months following cessation of their six session pilot of IR. The results of Nappi et al. (2010), Krakow et al. (2000) and Forbes et al. (2003) form part of a larger meta-analysis of thirteen studies investigating IR for the treatment of post-traumatic nightmares. This analysis revealed that IR has large effects on nightmare frequency, sleep quality and PTSD symptoms from initial to post-treatment assessment (Casement & Swanson, 2012). Furthermore, the effects were sustained through six and twelve month follow up (Casement & Swanson, 2012).

Thunker and Pietrowsky (2012) assessed the effectiveness of IR as a method for the treatment of Nightmare Disorder in those with and without post-traumatic symptoms. Thunker and Pietrowsky (2012) utilised an eight session manualised treatment of IR. They evidenced a decrease in nightmare frequency as well as nightmare related anxiety across three groups; those with Nightmare Disorder only, those with nightmares in the context of Depression and those with nightmares in the context of PTSD. This provides promising data that IR can be extended to diagnostic groups outside of PTSD alone. A literature search has revealed no published studies piloting the impact of IR as a technique for treatment of nightmares within the context of psychosis. IR has been used as a technique for treatment of intrusive daytime images for those with psychosis, as reported in individual case reports (Morrison, 2004; Serruya & Grant, 2009), and small case series, for those with persecutory delusions and intrusive visual memories, Schulze (2009), and for those with auditory hallucinations (Ison, 2011).

The current study aims to add to the well established literature of IR for the treatment of post-traumatic nightmares, and to the small literature on using IR in the context of psychosis, by considering whether IR for nightmares might be suitably adapted for use in a population with psychosis.

1.3.5 Exploratory hypotheses:

Hypothesis one: Following IR there will be a reduction in a range of nightmare related domains; frequency, nightmare related distress, vividness of nightmares and intensity of nightmares.

Hypothesis two: Following IR participants will have improved overall sleep quality, as measured by the PSQI

Hypothesis three: Following IR there will be a reduction in measures of psychotic and affective symptomatology.

Hypothesis four: IR will be deemed an acceptable treatment for nightmares in patients with psychosis, as indicated by end of session feedback and satisfaction ratings for the intervention.

2. Methods – Study A

The research comprises two separable studies; study A is a cross sectional study describing the phenomenology of nightmares in people with psychosis. Study B is a case series describing the use of Imagery Rehearsal (IR) as an intervention for nightmares in those with psychosis (see figure 2). The completion of the case series was reliant on study A demonstrating that some participants experience recurrent distressing nightmares; without this, no intervention was to be offered. The methods, results and discussion for study A will be presented first in chapters 2, 3 and 4. The methods, results and discussion for study B will follow in chapters 5, 6 and 7.

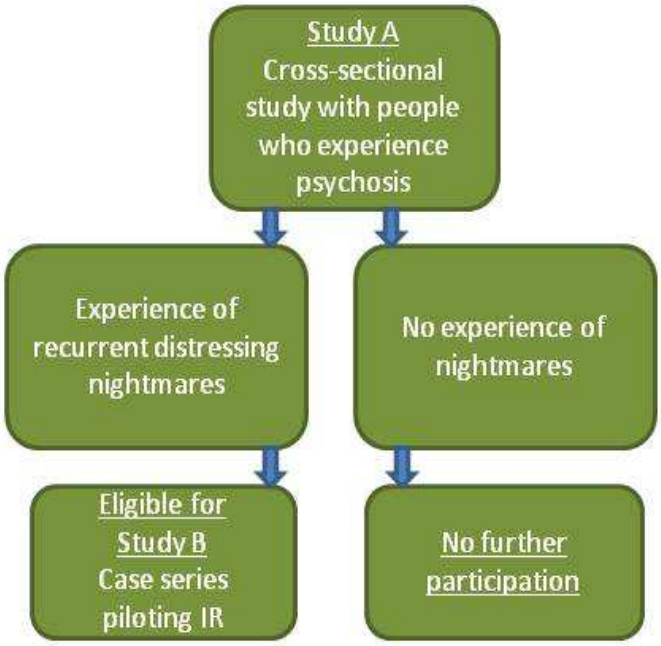

Figure 2. Diagram outlining the relationship between studies A and B.

2.1 Ethical Approval

The study was reviewed and approved by the City Road and Hampstead NHS Research Ethics Committee (11/LO/2045). The Research and Development department at South London and Maudsley NHS Foundation Trust (SLaM) granted approval for recruitment in community teams, the Psychological Interventions Clinic for Outpatients with Psychosis and inpatient wards. Approval was additionally granted from the SLaM Psychosis Clinical Academic Group (CAG). The Research and Development Department at Oxleas NHS Foundation Trust granted approval to recruit via Early Intervention Teams.

2.2 Design

The design of study A was cross sectional.

2.3 Recruitment

Recruitment was carried out over an 11 month time period, between March 2012 and January 2013. Participants were recruited via two south London NHS foundation trusts; South London and Maudsley NHS Foundation Trust (SLaM) and Oxleas NHS Foundation Trust. Services that were approached to assist with recruitment included: Community Mental Health Teams (CMHT's), an Early Intervention Team, an inpatient psychosis unit and a research register held by a specialist Psychological Intervention Clinic for outpatients with Psychosis (PICuP).

Team consultant psychiatrists, team leaders or Consultant Clinical Psychologists were emailed with an outline of the study, attaching a Participant Information Sheet (see Appendix 10.2). Consent was sought to attend a team meeting to discuss the study with team members. In meetings, the researcher explained briefly the scientific rational for the study, the potential relevance to clinical practice, the inclusion and exclusion criteria and what the role of care co-ordinators and participants would be through the research. Participant Information sheets were handed out to care co-ordinators who identified suitable participants and gained their consent for their contact details to be passed to the researcher. Potential participants were initially contacted via telephone by the researcher, offered further information about the study and invited to take part. Those who suggested that they were interested were sent an appointment letter and information sheet via post or email.

For those participants who were recruited via the PICuP research register, their consent to be contacted for research purposes had already been granted by virtue of them being on the register. The first contact was therefore made directly to the patient. For those patients who were on an inpatient ward, the team Consultant Clinical Psychologist approached patients face to face with an Information sheet about the study. Patients subsequently met with the researcher at the ward if they were interested.

In all cases, if participants agreed to attend a research appointment, they were met by the researcher at the Institute of Psychiatry, at their clinical team base or on the inpatient ward where they resided. A note of attendance was written on the participants electronic clinical records either by the researcher (for SLaM participants), or by the care co-ordinator (for Oxleas NHS Foundation Trust participants). If any clinical or risk issues relevant to the clients care arose during the assessment this information was passed to the participant's care co-ordinator.

Seven teams were approached to facilitate recruitment, four teams agreed. Across these four teams 40 participants were recruited (see figure 2).

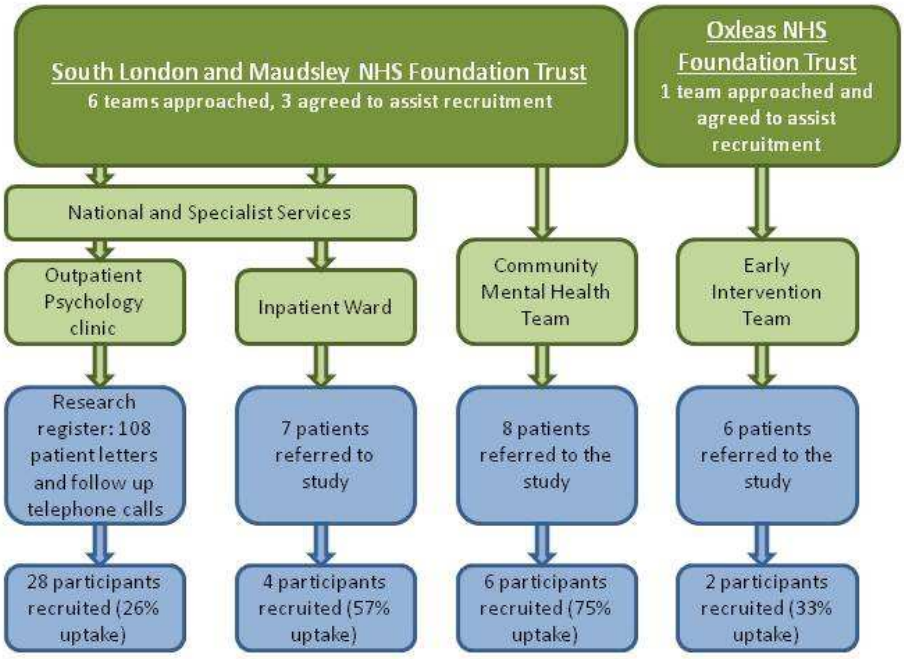

Figure 3. Recruitment flow chart; route to participation via NHS foundation trust and care team

2.4 Inclusion and Exclusion Criteria

Inclusion criteria for taking part in the study were:

1. Experience of delusions or hallucinations (psychosis)
2. Proficient use of the English language for the purpose of filling in questionnaires.
3. Aged 18 or over.
4. Able to give informed consent.

Participants were aware that the study was investigating "sleep patterns", but the information sheet stated: "whether you sleep very well, or have had sleep difficulties we would like to hear from you". The importance of referring any person with psychosis, irrespective of sleep quality, was also emphasised to teams.

Reasons for exclusion from the research:

1. A primary diagnosis of alcohol or substance dependency.
2. An organic syndrome such as dementia.
3. Learning disability.

2.5 Measures

2.5.1 General Information Questionnaire

All participants completed the General Information Questionnaire. This asked participants for their age, gender, ethnicity, alcohol use over the past 7 days and non-prescribed drug use over the past 14 days. In addition participants prescribed medications and dosages and subjective reports of side effects were noted. In instances where participants could not recall their current medications, these were taken from electronic medical records. Anti-psychotic medications were converted into Chlorpromazine equivalents using published tables (Woods, 2003; Atkins, Burgess, Bottomly & Riccio, 1997; Wulff et al., 2012). Lastly participants were asked to report any strategies (both helpful and less helpful) that they use to facilitate their sleep (Appendices: 10.4).

2.5.2 The Pittsburgh Sleep Quality Index (PSQI; Buysse, Reynolds, Monk, Berman & Kupfer, 1989)

The PSQI is a self-report measure of sleep quality over the month prior to assessment date. The questionnaire comprises 19 self report items and five questions rated by a bed partner. In order to avoid excluding participants who do not have a partner, the five informant rated measures were omitted. This decision was taken based on recruitment to a previous trial

in which 218/301(72%) of people with psychosis did not identify a person with whom they had a caring relationship / spent longer than 10 hours per week with (Garety et al., 2008). The PSQI questionnaire derives a Total Sleep Quality Index formed from seven sub-scores; duration of sleep, sleep disturbance, sleep latency, daytime dysfunction, sleep efficiency, subjective sleep quality and use of sleeping medications. See appendices: 10.5.

Evaluation of the PSQI indicates the seven component scores have good internal consistency (cronbach's alpha = .83) and the global index score and seven component scores yield acceptable test-retest reliability (Buysse et al., 1989). A cut off score of >5 for the global index score has been shown to provide good diagnostic sensitivity and specificity for distinguishing good from poor sleepers (Buysse et al., 1989). The psychometric properties reported in Buysse et al. (1989) were derived from a sample of participants with diagnosed sleep disorders, healthy controls without sleep complaints and those with major depressive disorder. A literature review revealed that the psychometric properties have not yet been evaluated in those with psychosis.

2.5.3 Dream Log for study A. Adapted from dream logs used by Levin & Fireman (2002).

Participants completed a retrospective dream log (adapted from Levin & Fireman, 2002). Participants were informed that they would be asked about the presence of nightmares at the point of making an appointment for the study. Previous research has indicated that retrospective nightmare frequency logs measuring up to a month in the past do not yield statistically different measures to prospective nightmare logs (Robert & Zadra, 2008). Participants were asked to indicate how many nightmares they estimated they had experienced over the past two weeks (14 nights). If the participant had experienced at least one nightmare they were asked to answer four further questions based on their worst nightmare. Participants rated the chosen nightmare on a seven point likert scale for intensity, vividness and distress engendered. Lastly they were asked whether they had experienced that chosen nightmare before to mark whether that nightmare was recurrent. See appendices 10.6.

2.5.4 The Psychotic Symptom Rating Scale (PSYRATS; Haddock, McCarron,Tarrier & Faragher, 1999)

The Psychotic Symptom Rating Scale (PSYRATS; Haddock et al., 1999) measured the severity of different dimensions of auditory hallucinations and delusions. The scales

comprise of a semi-structured interview marking severity of 17 items (11 items assess auditory hallucinations, six assess delusions), using a four point scale. Evaluation of the PSYRATS indicates that the scale has good inter-rater reliability for both the delusion items (≥.88; Haddock et al. 1999) and the auditory hallucination items (≥.78; Haddock et al. 1999). Concurrent validity has been demonstrated; the delusions scale correlated with the Positive and Negative Syndromes Scale (PANSS), delusion item (Spearman's = 0.43; Drake, Haddock, Tarrier, Bentall & Lewis, 2007) and the hallucination scale correlated with the PANSS hallucination item (Spearman's = 0.81; Drake et al., 2007). The PSYRATS hallucination and delusion scales are sensitive to change over time; change in delusions scale score correlated with the PANSS delusion item score change(Spearman's = 0.80; Drake et al., 2007) and change in hallucinations score correlated with the PANSS hallucination item score change (Spearman's = 0.88; Drake et al., 2007). See appendices: 10.7 and 10.9.

2.5.5 Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995a)

The Depression, Anxiety Stress Scale 21 item measure (DASS-21; Lovibond & Lovibond, 1995a) was completed based on participants' experience over the past week. The scale comprises of 21 items (E.g. 15: I felt I was close to panic), rated on a scale from zero (did not apply to me at all) to three (applied to me very much, most of the time). Seven items each load onto three factors; depression, anxiety and stress and combine to create a total score. The scale is a short form version of the full 42 item version (Lovibond & Lovibond, 1995a).

Henry and Crawford (2005) have analysed the psychometric properties of the DASS-21. They report the internal consistencies to be good for the depression scale (cronbach's alpha = 0.88) and the anxiety scale (cronbach's alpha = 0.82) and very good for both the stress scale (cronbach's alpha = 0.90) and the total score (cronbach's alpha = .93). The depression and anxiety sub-scales of the original 42 item version has been shown to have good construct validity, as evidenced by the strong correlation between the depression sub-scale and the Beck Depression Inventory, as well as between the anxiety sub-scale and the Beck Anxiety Inventory (Lovibond & Lovibond, 1995a). Although the full DASS was designed as a screening measure in non-clinical populations, it has been validated for use

with clinical populations (Brown, Chorpita, Korotitsch & Barlow, 1997). See appendices: 10.11.

2.5.6 CORE-10 (Connell & Barkham, 2007)

The CORE-10 (Connell & Barkham, 2007) was used as a screening measure of psychological distress. The construct of psychological distress is not linked to a particular disorder, but individual items cover anxiety (2 items), depression (2 items), trauma (1 item), physical problems (1 item) functioning (3 items) and risk to self (1 item; CORE-ims, n.d.). The CORE-10 has been shown to be sensitive to change and has good internal reliability with a Chronbach alpha of .82 (Connell & Barkham, 2007). It correlates well with measures of anxiety, depression and general mental health (Connell & Barkham, 2007).

2.5.7 Posttraumatic Diagnostic Scale (PDS; Foa, Cashman, Jaycox & Perry (1997)

The Posttraumatic Diagnostic Scale (PDS; Foa et al., 1997) was used as a self-report measure of post-traumatic stress disorder. The scale can be used to yield a preliminary PTSD diagnosis according to DSM-IV criteria as well as mark symptom severity. It has been shown to have high internal consistency, test re-test reliability and high diagnostic validity when compared with the Structured Clinical Interview and good sensitivity and specificity (Foa et al., 1997).

2.5.8 Time Budget Questionnaire (Jolley et al., 2006)

The Time budget Questionnaire (Jolley et al. 2006) was administered as a structured clinical interview assessing use of time over the preceding week. The measure was designed specifically for those with psychosis. It maps activities over a seven day week, with each day split into 4 time reference periods (morning, middle of the day, afternoon and evening). Interviewers probe for activities, degree of independence in activities, and number and nature of social contacts (Jolley et al. 2006). Activities are rated according to the complexity of the activity and the effort required. The measure has been shown to have convergent validity with regard to activity levels and social contact (Jolley et al., 2006). See appendices: 10.12.

2.5.9 Digit Span sub-test - Wechsler Memory Scale third edition (WMS-III)

This is a widely used measure of working memory in both clinical and research settings. The measure has been well standardised on a US representative sample of 1,250 adults aged between 16 and 89. The digit span has a reliability coefficient of .86. The digit span raw score is converted to a scaled score ranging between 1 and 19. The scaled score has a mean of 10 and a standard deviation of 3. Scaled scores are standardised across age range.

2.6 Procedure for Study A

All participants met with the author for approximately 1.5 hours. Each participant completed three semi-structured interviews, four questionnaires and one neuropsychological sub-test.

Participants were thanked for attending the appointment. They were given the opportunity to read the information sheet again and ask any questions prior to informed consent being sought. It was explained to participants that they could take a break at any point during the research. Participants were told that information given throughout the assessment would remain confidential but that if the researcher was concerned about the safety of the person, or others around them they would share this information with the persons NHS care team. Following this, participants completed the consent form for study A.

Participants completed the General Information Questionnaire, the PSYRATS for hallucinations followed by the PSYRATS for delusions with the researcher. Following this participants completed the Pittsburgh Sleep Quality Index, the Dream log for study A, the CORE-10 and DASS-21 independently but were given the option of completing the questionnaires verbally (using the researcher as a scribe). Following this, the PDS and Time Budget Questionnaire were completed with the researcher. Lastly, participants completed the Digit Span sub-test from the WMS-III, administered by the researcher.

The order of assessment measures (as described above) was held constant across all participants with the trauma questionnaire (PDS) intentionally placed after the psychotic (PSYRATS) and mood symptom (Core-10 and DASS-21) questionnaires. This order was decided to reduce the impact of mood changes induced by the trauma questionnaire (PDS).

Fatigue effects were minimised by offering participants breaks and interchanging between verbal and written assessment measures. There was one exception in which the order was changed; one participant completed the independent measures prior those that are completed with the researcher due to room availability difficulties on a busy ward.

Following completion of the measures participants were thanked for their time, a brief explanation of the study was offered and if they met the eligibility criteria for study B, their interest in taking part was discussed and noted. Participants were told that the researcher would contact them at a later date should they be invited to take part.

2.7 Power Calculation

This study is an exploratory study; no other study has investigated nightmares within the context of psychosis. The following power analysis is therefore based on the assumption that the associations between nightmare distress and daytime symptomatology is at least as strong as in the general population. Levin and Fireman (2002) observed correlations of between .43 and .55 between nightmare distress and daytime symptomatology. The study will have 80% power to detect a correlation of .43 if a sample of at least 37 participants is recruited. This will therefore be the minimum number of participants to be recruited.

2.8 Analyses

PASW statistics version 18 was used to perform all inferential statistics. The only exception to this is that 95% confidence interval for proportions was calculated using Graphpad.com (a non-software confidence interval calculator).

3. Results – Study A

This chapter will report on the results from study A. The sample with be described with regards to demographic variables and clinical characteristics. Following this, the phenomenology of nightmares in the context of psychosis will be reported on. Specifically, the frequency of nightmares in psychosis will be reported and compared to data from a general population sample. The link between nightmares and a range of daytime symptomatology will be reported and lastly, whether nightmare frequency or nightmare distress best accounts for links with daytime symptomatology.

3.1 Sample demographics

The mean age of participants was 41.9 years (range 18-68). The sample comprised of 62.5% males and 37.5% females. The ethnicity of the majority of the sample was White British (42.5%), the second largest category was Black African (20.0%; table 1).

Table 1. Ethnicity of the Sample (n=40) by Categories used in Office of Population Censuses and Surveys

Category	Frequency	%
White British	17	42.5
Black African	8	20.0
White (other)	4	10.0
White Irish	2	5.0
Black Caribbean	2	5.0
Black British	1	2.5
Asian Indian	1	2.5
Mixed Afro-Caribbean	1	2.5
Mixed White British and Afro-Caribbean	1	2.5
Mixed White and Black Caribbean	1	2.5
Mixed Indian/Algerian	1	2.5
Mixed (other)	1	2.5

3.2 Clinical Characteristics

3.2.1 Diagnoses

All but one of the participants had active symptoms of psychosis, as measured by the PSYRATS. The one participant who reported no active symptoms had a current diagnosis of Paranoid Schizophrenia and reported a history of paranoid beliefs, but 0% conviction in these over the week prior to assessment date.

Of the sample of 40 participants, 22 (55%) had a primary diagnosis of Schizophrenia, four (10%) Schizoaffective Disorder, three (7.5%) Unspecified Non-organic Psychosis, three (7.5%) Bipolar Disorder, two (5%) Post-Traumatic Stress Disorder and two (5%) Severe Depressive Episode with Psychotic Symptoms. The remaining participants had been diagnosed with Adjustment Disorder (n=1, 2.5%), Mental and Behavioural Disorder due to use of Cannabinoids (n=1, 2.5%),and Behcets Disease with Other Persistent Affective Disorders (n=1, 2.5%).

3.2.2 Symptoms of Psychosis

Twenty seven of the 40 participants reported hearing voices in the week prior to assessment. Length of time hearing voices ranged from 10 months to 29 years. There were no missing values within the data. Analysis of the mean PSYRATS for hallucination scores of the 27 participants who reported hearing voices suggested that they heard voices at least once per day. When heard, the mean score suggested voices lasted for several minutes, the voices were about the same volume as the participants' own voice and a minority of the voice content was negative, saying things that related to the self-concept (E.g. "you're lazy"). A minority of the voices were distressing, to a moderate degree. For these 27 participants, the mean score for disruption to life suggested that voices caused minimal disruption to life, such that the participant group were able to complete activities, but that the voices interfered with their ability to concentrate. Mean PSYRATS for hallucinations data, with standard deviations are reported in table 2.

Table 2. Mean PSYRATS for Hallucinations Score for participants who reported hearing voices (n=-27)

	Mean PSYRATS Score (0-4)	Std. Deviation	Interpretation
Frequency of voices	2.07	1.57	Voices occur at least once a day
Duration of voices	1.78	1.42	Voices last for several minutes
Location of voices	1.74	1.40	Voices outside the head, but close to ears or head. Voices inside the head may also be present
Loudness of voices	2.37	1.15	About the same loudness as own voice
Beliefs regarding origins of voices	2.30	1.30	Holds a less than 50% conviction that voices originate from external causes
Amount of negative content of voices	2.26	1.68	Minority of voice content is unpleasant or negative (less than 50%)
Degree of negative content of voices	2.52	1.74	Personal verbal abuse relating to self-concept e.g. "you're lazy, ugly, mad, perverted"
Amount of distress	2.22	1.63	Minority of voices distressing (< 50%)
Intensity of distress	2.04	1.56	Voices are distressing to a moderate degree
Disruption to life, caused by voices	1.44	1.12	Voices cause minimal amount of disruption to life, e.g. interferes with concentration although able to maintain daytime activity and/or social or family relationships and be able to maintain independent living without support.
Controllability of voices	2.67	1.78	Subject believes they can have some control over the voices but only occasionally. The majority of the time the subject experiences voices which are uncontrollable
PSYRATS HALLUCINATIONS TOTAL (0-44)	**23.41**	**12.19**	

Thirty five (87.5%) of the 40 participants reported experiencing delusions. Length of time of holding a delusional belief ranged from three months to 41 years. There was one missing value for one question, across all 40 participants. This missing value (question two) was calculated from the mean of the scores from the other five items for that participant (person-mean computation). Analysis of the mean PSYRATS for delusions scores of the 35 participants who experienced delusional beliefs suggested that they thought about their beliefs at least once per day. When these thoughts came to mind, they lasted for several minutes. The mean level of conviction in the belief was strong but not absolute; between

50-99%. The beliefs caused distress on a minority of occasions (<50%) and when distressing, they were moderately distressing. Mean PSYRATS for delusions data, with standard deviations is reported in table 3.

Table 3. Mean PSYRATS for Delusions Score for participants who reported delusional beliefs (n=35)

	Mean PSYRATS Score (0-4)	Std. Deviation	Interpretation
Amount of Pre-occupation	1.71	1.10	Thinks about beliefs at least once per day
Duration of Pre-occupation	2.12	1.30	Thoughts about delusions last for several minutes
Conviction at time of Interview	2.71	1.20	Conviction in belief is very strong, between 50-99%
Amount of Distress	2.31	1.64	Beliefs cause distress on less than 50% of occasions
Intensity of Distress	2.14	1.40	Beliefs cause moderate distress
Disruption to Life Caused by Beliefs	1.54	1.01	Beliefs cause moderate amount of disruption to life causing some disturbance to daytime activity and/or family or social activities. The patient is not in hospital although may live in supported accommodation or receive additional help with daily living skills.
PSYRATS Delusions Total (0-24)	**12.55**	**5.81**	

3.2.3 Affect - Depression, Anxiety and Stress

There were four missing items across all questions and all participants. They were missing from four separate participants. Two of the four items loaded on to the depression scale, one on the anxiety scale and one on the stress scale. For each instance, the missing value was calculated from the mean of the other six items making up that scale (person-mean imputation).

Using norms provided from the DASS manual (Lovibond & Lovibond, 1995b) the mean depression score for the forty participants fell within the 'moderate' range (mean = 19.23,

s.d. = 11.19, range = 0-42). The mean anxiety score for the sample fell within the 'severe' range (mean, 16.03, s.d. = 9.65, range =2-38) and the mean stress score fell within the 'moderate' range (mean = 19.68, s.d. = 8.70, range = 2-38).

There was a spread of scores across clinical status, with participants presenting with non-clinical levels of depression, anxiety and stress, through each category to extremely severe levels of depression anxiety and stress (see table 4).

Table 4. Frequency of participants falling within varying degrees of clinical severity across the Depression, Anxiety and Stress scales of the DASS-21 (Lovibond & Lovibond, 1995).

		Clinical Status				
		Non-clinical	**Mild**	**Moderate**	**Severe**	**Extremely Severe**
Frequency	**Depression**	7 (17.5%)	7 (17.5%)	9 (22.5%)	4 (10%)	13 (32.5%)
	Anxiety	9 (22.5%)	0 (0.0%)	10 (25%)	7 (17.5%)	14 (35%)
	Stress	12 (30%)	10 (25.0%)	6 (15%)	9 (22.5%)	3 (7.5%)

3.2.4 Global Distress

The mean score for global distress as measured by the CORE-10 was 1.73 (s.d. = 0.69) which falls into the clinical range irrespective of gender (clinical cut off scores are different for male and female participants; Connell & Barkham, 2007). This mean score would be classified as 'moderate' distress (Connell & Barkham, 2007). The global distress of participants ranged from healthy to severe distress (table 5).

Table 5. Frequency of participants as a function of the level of severity of global distress (N=40) (Connell & Barkham, 2007)

Level of Severity of Global Distress	Frequency
Healthy	1 (2.5%)
Low Level Distress	2 (5.0%)
Mild	12 (30.0%)
Moderate	13 (32.5%)
Moderate to severe	7 (17.5%)
Severe	5 (12.5%)

3.2.5 Post-Traumatic Stress Disorder (PTSD)

All participants answered the section of the PDS relating to experience of traumatic events. Thirty six (90%) of the 40 participants reported experiencing at least one traumatic event throughout their life. The mean number of traumatic events experienced by all 40 participants was 3.20 (s.d. 2.09). Twelve (30%) of 40 participants reported Child Sexual Abuse (CSA), whilst 28 (70%) reported no history of CSA. The PDS questionnaire separates participants into those meeting a preliminary diagnostic criteria for PTSD, those who do not meet preliminary diagnostic criteria and lastly, those who would require further information (beyond that of the questionnaire) in order to clarify whether that participant meets diagnostic criteria. Thirty nine participants completed questions sufficient to code into these categories. Seventeen (44%) out of 39 participants met criteria for a diagnosis of PTSD, 20 (51%) participants did not meet diagnostic criteria for PTSD and two (5%) participants required further information beyond the PDS questionnaire in order to clarify whether they met diagnostic criteria. Eleven of the 17 participants who met criteria for a diagnosis of PTSD (65%) had weekly nightmares. This was not significantly higher than the 10/20 (50%) participants who reported weekly nightmares but did not meet diagnostic criteria for PTSD *(X^2 (1, n=37) = .81, p = n.s.)*.

Given the wide range of events that were reported by a person with psychosis as traumatic and their relation to illness characteristics, further analysis of traumatic events were undertaken. The index event which the participant chose to complete the PDS for (i.e. the one that bothered them the most) was coded on the basis of its proximal link to the person

and their psychosis (Picken & Tarrier, 2011)[1]. Four categories were used; whether the event was (1) 'independent' from the participants own action (e.g. natural disaster or child sexual abuse), (2) 'possibly independent' from their own action (e.g. a physical assault), (3) 'dependent on illness behaviour' (for example being hospitalised against their will) and (4) 'dependent on a symptom' (e.g. a traumatic hallucination or delusion). Twenty two (64%) out of 36 index events were independent of the person and their psychotic symptoms. Ten (28%) events were possibly independent, two (6%) were dependent on illness behaviour, one (3%) was dependent on a symptom and one (3%) participant did not provide enough information to code the event.

3.2.6 Substance Use

Nine of the forty participants had taken non-prescribed drugs or medications in the week prior to assessment date. Of these nine, two reported taking cannabis. The remaining seven took over the counter medications; five participants reported taking paracetamol for pain relief, one participant took 'Kalms' tablets (a herbal remedy designed to promote sleep) and one participant took a multi-vitamin.

The distribution of alcohol use in the week prior to assessment date was positively skewed. 24 of the 39 (61%) participants who reported their alcohol use consumed zero units of alcohol, resulting in a median alcohol use of zero units. Alcohol use ranged from zero units to 80 units. The recommended daily intake of alcohol is 2-3 units for females and 3-4 units for males (Department of Health, 2012). Using these figures as a guide and multiplying them by a seven day week suggested that three male participants (12%) and one female participant (7%) were consuming above the recommended intake of alcohol.

3.2.7 Insomnia

A score of greater than five on the PSQI indicates clinically relevant sleep disturbance (Backhaus, Junghanns, Broocks, Riemann & Hohagen, 2002). Of the total sample of forty participants, 34 (85%) had a score greater than five, 6 (15%) participants had a score less than or equal to five.

[1] Within the context of psychosis, studies have widened the context of traumatic index event to include involuntary hospitalisation, distressing symptoms and treatments (Picken & Tarrier, 2011).

More detailed analysis of the PSQI data indicates that the mean hours of sleep per night of the forty participants was seven hours (s.d. 2.59) suggesting that participants were receiving adequate hours of sleep in total. However their sleep efficiency was 71.92% (s.d. 22.48), suggesting that on average less than three quarters of the amount of time spent in bed was spent actually asleep.

3.2.8 Medication

Thirty nine out of 40 (97.50%) participants reported taking at least one medication for either physical or mental health problems. Thirty five out of 40 (87.5%) reported taking an anti-psychotic medication, 17/40 (42.50%) were prescribed an anti-depressant, 7/40 (17.50%) were prescribed a mood stabiliser and 5/40 (12.50%) reported being prescribed medication for insomnia.

When asked to list side effects experienced from all medications, 15/40 (37.50%) participants mentioned sleep (ie. sleep onset/offset/drowsiness during the day/parasomnias). One participant listed "dream more rapidly" as a side effect of Simvastatin medication (for high cholesterol). Four participants were prescribed Simvastatin; these four experienced between 3 and 40 nightmares over the course of 14 nights.

Chlorpromazine equivalents of anti-psychotic medications were not significantly correlated with nightmare frequency ($r_s(40) = -.16$, $p = .34$) nor nightmare related distress ($r_s(40) = -.07$, $p = .71$). A medium negative correlation was found between chlorpromazine equivalents and sleep quality ($r_s(40) = -.40$, $p < .05$) and a medium positive correlation was found between sleep efficiency (percentage of hours in bed spent asleep; $r_s(40) = -.4$, $p < .01$).

Chlorpromazine equivalents of antipsychotic medications were not significantly correlated with PSYRATS for delusions score ($r_s(40) = -.04$, $p = .82$), global distress ($r_s(40) = .03$, $p = .86$), depression ($r_s(40) = -.07$, $p = .68$), anxiety ($r_s(40) = .17$, $p = .29$), stress($r_s(40) = .06$, $p = .70$), PTSD symptom severity ($r_s(20) = -.04$, $p = .88$), time budget (daytime activities: $r_s(39) = -.03$, $p = .86$) or working memory ($r_s(39) = .30$, $p = .06$). There was however a medium positive

correlation between dose of anti-psychotic medication and PSYRATS for hallucinations ($r_s(40) = .33$, $p < .05$).

Further analyses involving measures of sleep quality, sleep efficiency and auditory hallucinations shall therefore control for anti-psychotic medication dose.

3.3 Distribution of key variables; nightmare frequency and nightmare distress

In order to establish whether a correlation co-efficient is significant using a parametric (Pearson's) correlation, data are required to be normally distributed on both variables. The assumption of normality was assessed for the two key variables (nightmare frequency and nightmare distress) via both visual plots and descriptive statistics of skewness and kurtosis. A histogram and Q-Q plot both indicated that the nightmare frequency variable was positively skewed (see figure 3). This was substantiated by a skewness of 4.09 (*SE* = .37) resulting in a *z*-score for skewness of 11.05. This indicates significantly positive skew (p<.001). The kurtosis score of 18.62 (*SE* = .73), results in a *z*-score for kurtosis of 25.51, which is significant (p<.001).

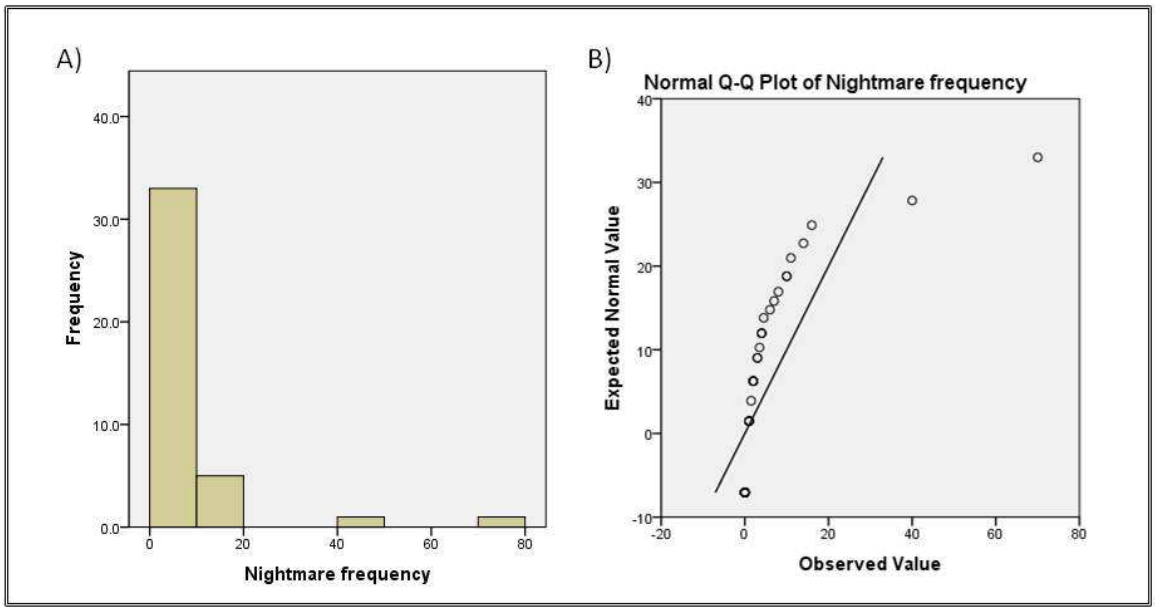

Figure 4. Skewed distribution of nightmare frequency data as evidenced by A) histogram and B) Q-Q Plot.

A histogram indicated a degree of negative skew for nightmare distress, whilst the Q-Q plot was more ambiguous to interpret (see figure 4). A skewness value of -.794 (*SE* = .441)

resulted in a non-significant *z*-score for skewness of -1.80 (p>.05). The kurtosis was -.171 (*SE* = .858) resulting in a non-significant *z*-score for kurtosis of -0.20 (p>.05). Given the negative skew indicated by the histogram, non-parametric (Spearman's) correlations will be reported. This also serves to maintain consistency with the non-parametric correlation coefficients that are reported for nightmare frequency.

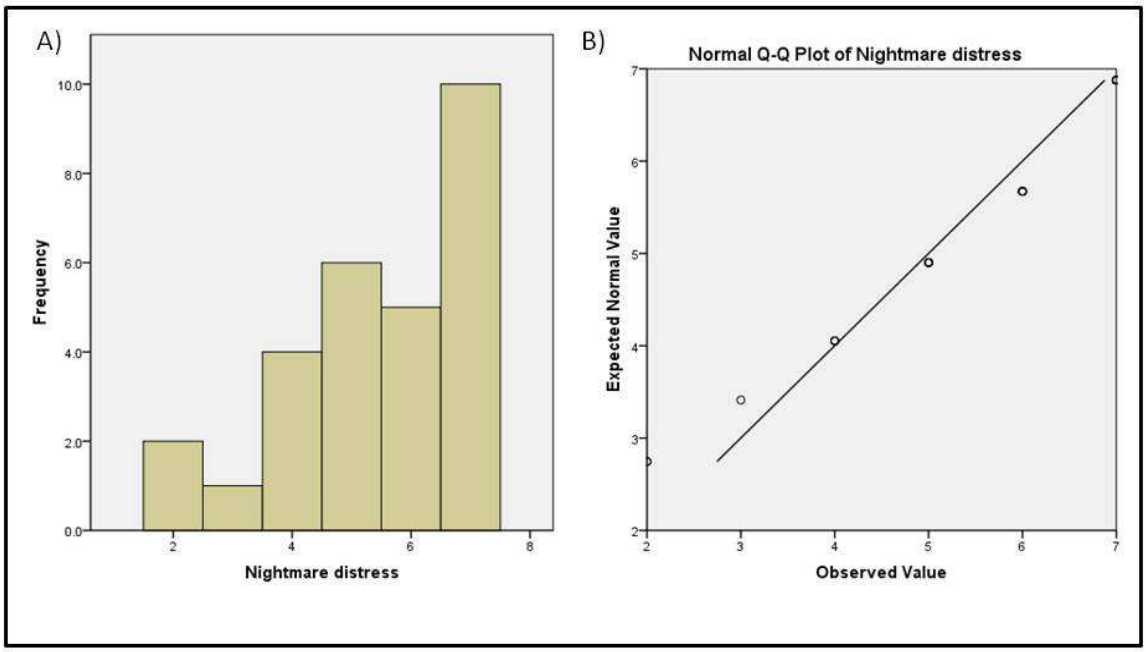

Figure 5. Skewed distribution of nightmare distress data as evidenced by A) histogram and B) Q-Q Plot.

3.4 Power and risk of a Type II error

The study had 80% power to detect significant correlations of at least .43, utilising data from the entire sample of participants recruited. This was planned to be a minimum of 37. Therefore, any correlation smaller than .43, or variables completed by a sub-sample of participants (E.g. nightmare distress) are at risk of a Type II error.

3.5 Phenomenology of Nightmares

Twenty eight of the sample of 40 (70%) reported at least one nightmare over the two week reference period. Of the 28 people who reported a nightmare, 16 reported that their most distressing nightmare over the two week period was a recurrent nightmare. The median

score for nightmare related distress (from the scale from 1-7) was 6, median vividness of the nightmare was 6 and median intensity of the nightmare was also 6.

3.5.1 Hypothesis 1: Nightmares are more prevalent in the context of psychosis than in the general population.

This hypothesis was supported. Large community based epidemiological studies from outside of the UK indicate that 0.9-6.8% of the general population report weekly nightmares, a frequency thought to reflect moderately severe pathology (Nielson & Levin, 2007). Within the current sample of 40 participants with psychosis, 55.0% experienced at least weekly nightmares (ie. two or more nightmares over a two week period). The 95% confidence interval is 38.5% to 70.7%. The 0.9-6.8% prevalence of nightmares in the general population does not fall within the 95% confidence interval (38.5-70.7%), indicating that there is a significantly higher proportion of people with psychosis who experience weekly nightmares than found in the general population (figure 5).

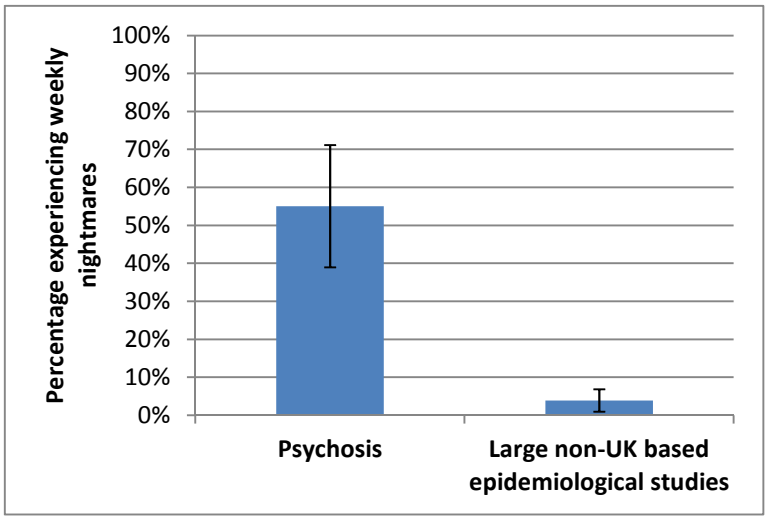

Figure 6. Percentage of people experiencing weekly nightmares as a function of sample; psychosis (current study) versus results of a literature review of non-UK based large epidemiological studies (Nielson & Levin, 2007; Li et al., 2010; Janson et al., 2005). Error bars for psychosis group indicate 95% confidence interval, error bars for general population indicate the range of values reported across all studies reviewed (0.9-6.8%).

The one study reporting the prevalence of nightmares from a UK sample found that 42% experienced at least one nightmare over a two week time period (Blagrove et al., 2004). Based on the reported 42% fortnightly prevalence and the sample size of 147, the 95% confidence interval is 34.0% to 50.6%. The current sample of 40 people with psychosis found that 70% experienced at least one nightmare over a two week reference period. The

95% confidence interval, calculated using Graphpad.com is 53.5% - 83.4%. The confidence interval for the current sample (53.5-83.4%) does not overlap with the confidence interval calculated from the general UK sample of Blagrove et al. (2004) (34.0-50.6%). As such, the proportion of people with psychosis who experience fortnightly nightmares is significantly higher than that found in the general UK population (figure 6).

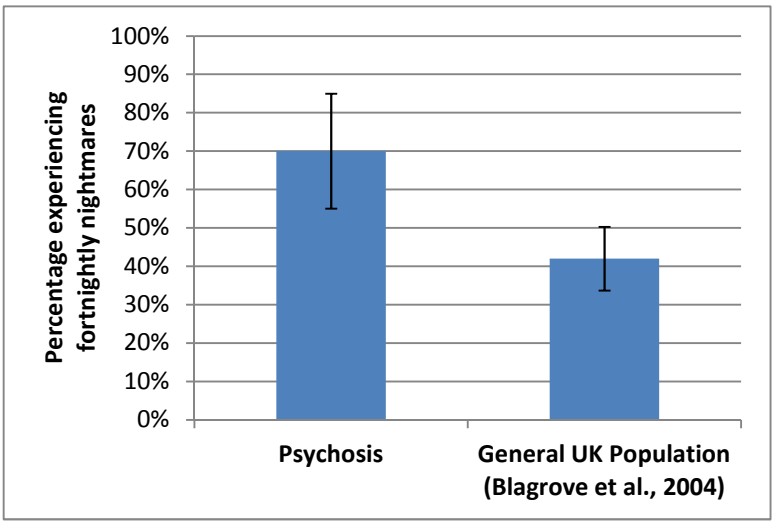

Figure 7. Percentage of people experiencing fortnightly nightmares as a function of sample; psychosis (current study) versus the general UK population (Blagrove et al., 2004). Error bars indicate 95% confidence intervals.

3.5.2 Hypothesis 2: Nightmare frequency will be correlated with the measures of sleep. A positive correlation is expected between overall sleep quality (measured by the PSQI) and nightmare frequency (higher scores on the PSQI indicate worse sleep quality). A negative correlation is expected between nightmare frequency and sleep efficiency.

This hypothesis was supported (see figure 7). A non-parametric Spearman's rho was calculated for the two correlations. Hochberg's correction for multiple comparisons will be reported in addition to the original significance level.

A large positive correlation was found between nightmare frequency and overall sleep quality, as measured by the PSQI ($r_s(40) = .50$, $p < .01$). When adjusted for multiple comparisons (Hochberg's correction) this remained significant (p <.01). When anti-psychotic medication was controlled for, a medium positive correlation remained ($r_s(37) = .48$, $p < .01$). Nightmare frequency was negatively correlated with sleep efficiency (hours asleep/hours spent in bed*100), this was a large significant association ($r_s(40) = -.52$, $p <$

.01) which remained significant after correcting for multiple comparisons (p < .01). When anti-psychotic medication was controlled for, a large negative correlation remained, (r_s(37) = -.51, p < .01).

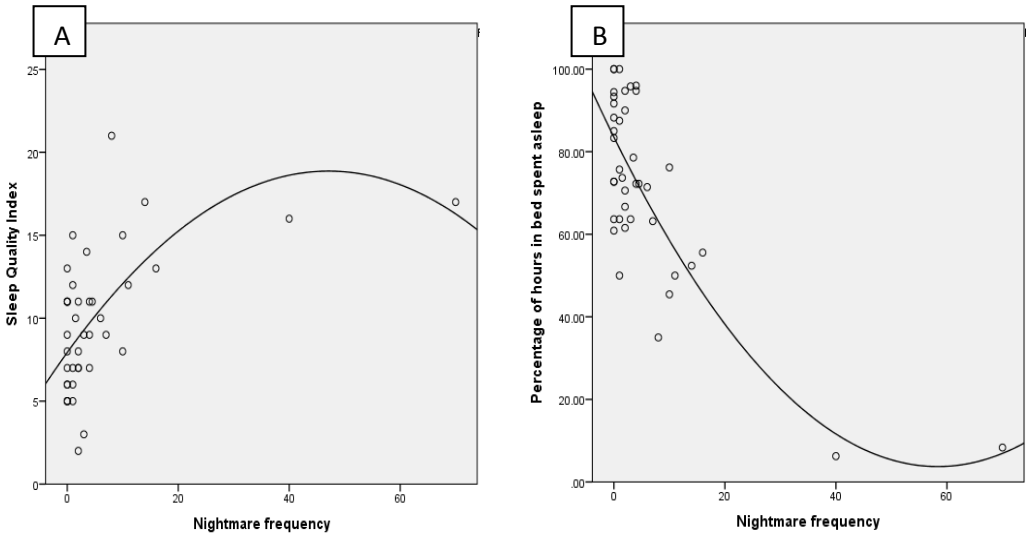

Figure 8. Scatter plots illustrating nightmare frequency as a function of A) Sleep Quality Index and B) Sleep efficiency (percentage of hours in bed spent asleep). Trend line indicates the quadratic R^2(A = .35, B = .42, C = .61).

Given that nightmares interrupt continuous sleep, exploratory analysis investigated the relationship between nightmare frequency and total hours of sleep per night. A medium negative correlation was found between nightmare frequency and sleep quantity (overall hours of sleep per night; r_s(40) = -.44, p < .01). This remained significant when adjusted for multiple comparisons (p < .01). When anti-psychotic medication was controlled for, a medium negative correlation remained, (r_s(37) = -.42, p < .01).

3.5.3 Hypothesis 3: Nightmare frequency will be positively correlated with severity of daytime psychiatric symptoms. These include severity of delusions, auditory hallucinations, PTSD symptoms, depression, anxiety, stress and global distress.

This hypothesis was partially supported (figure 8). Two way Spearman's rho indicated a large positive correlation between nightmare frequency and the depression scale of the DASS-21 (r_s(40) = .53, p =.000). This finding remained significant when adjusting for multiple corrections (p=.000). A medium positive correlation was found between nightmare frequency and global distress, as measured by the CORE-10 (r_s(40) = .35, p < .05). However, this lost significance when adjusting for multiple comparisons (p=.19). All other

measures of daytime symptomatology yielded small positive correlations with nightmare frequency and were therefore in the expected direction; however each failed to reach statistical significance. This included severity of hallucinations (voices) as measured by the PSYRATS ($r_s(40) = .15$, $p = .35$), severity of hallucinations whilst controlling for anti-psychotic medication ($r_s(37) = .2$, $p = .19$), severity of delusions as measured by the PSYRATS ($r_s(40) = .15$, $p = .37$), anxiety scale from the DASS-21 ($r_s(40) = .27$, $p = .09$), stress scale from the DASS-21($r_s(40) = .24$, $p = .13$) and PTSD symptom severity as measured by the PDS ($r_s(40) = .26$, $p = .26$). Scatter plots for all non-significant results can be found in appendix 13.

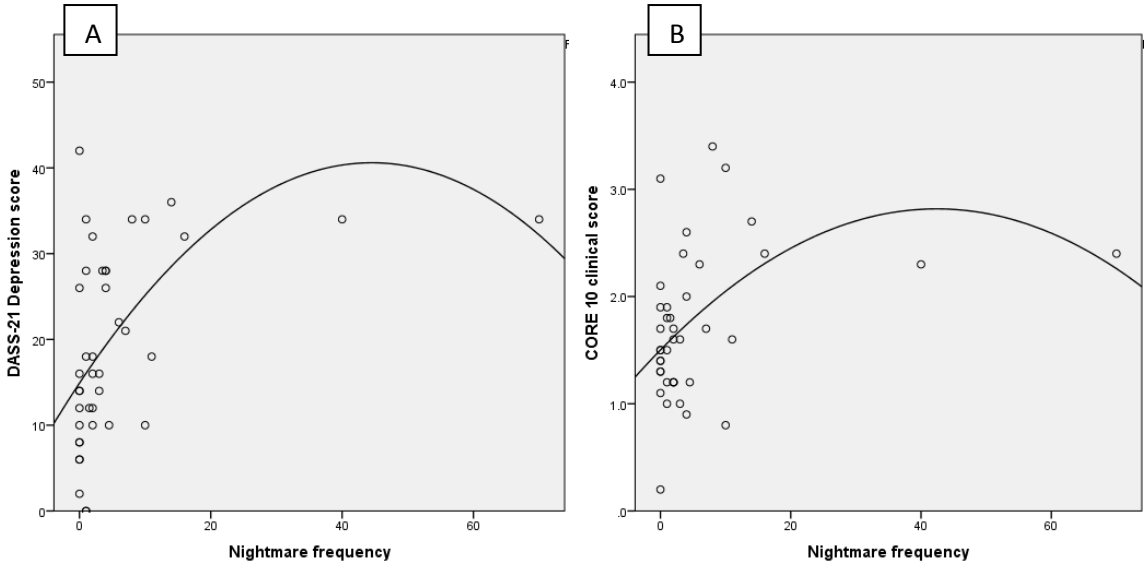

Figure 9. Scatter plots indicating nightmare frequency as a function of A) DASS-21 measured depression and B) CORE-10 measure of global distress. Trend line indicates the quadratic R^2 (A =.26, B= .18).

3.5.4 Hypothesis 4: Nightmare related distress better accounts for disturbance in daytime psychological functioning and daytime activity levels than nightmare *frequency*.

This hypothesis was supported (see figure 9). As reported above, one large significant correlation was found between nightmare frequency and a measure of daytime psychological functioning; depression ($r_s(40) = .53$, $p = .00$) (see figure 8). This remained significant after Hochberg's correction for multiple comparisons (p = .00).

Nightmare distress however was significantly correlated with four measures of daytime psychological functioning. A large significant correlation was found between nightmare distress and delusional severity, as measured by the PSYRATS ($r_s(28) = .59$, $p < .01$), this remained significant after controlling for multiple comparisons ($p < .05$). A large significant

correlation was found between nightmare distress and stress ($r_s(28) = .53$, $p < .01$), this remained significant after controlling for multiple comparisons, ($p<.05$). A large significant correlation was found between nightmare distress and anxiety ($r_s(28) = .53$, $p < .01$) and this too remained significant after controlling for multiple comparisons ($P<.05$). Similarly to nightmare frequency, a large significant correlation was found between nightmare distress and depression ($r_s(28) = .61$, $p < .01$), this again remained significant when controlling for multiple comparisons (see table 6).

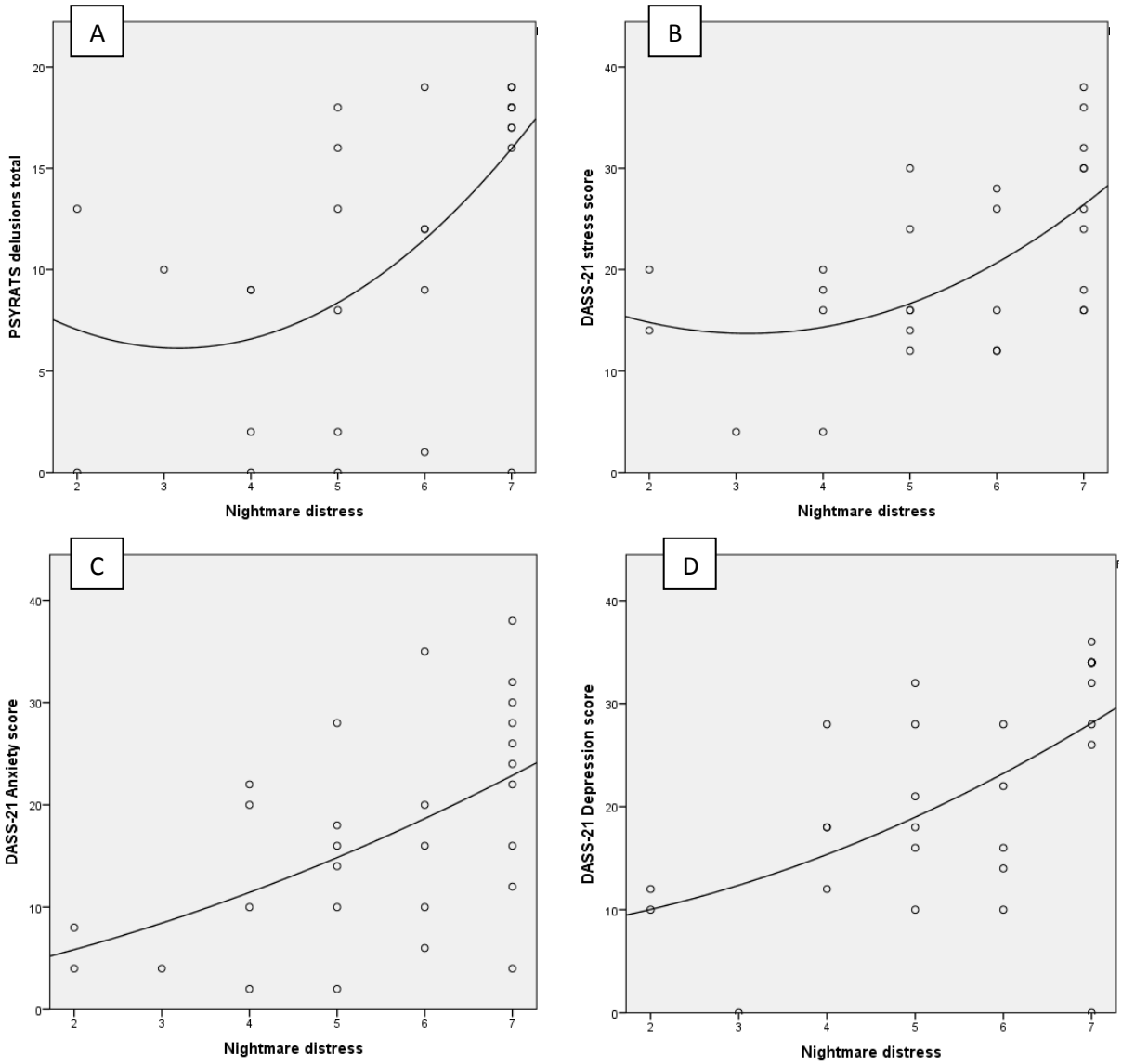

Figure 10. Scatter plots indicating nightmare distress as a function of A) PSYRATS measured delusional severity B) DASS-21 measured stress C) DASS-21 measured anxiety and D) DASS-21 measured depression. Trend line indicates the quadratic R^2 (A =.31, B= .34, C= .28, D=.32).

There was a medium positive association between nightmare distress and global distress ($r_s(28) = .47$, $p < .05$), however this fell below significance when controlling for multiple comparisons (p=.06) and should therefore be treated with caution. The measure of daytime activities (Time Budget Questionnaire) was negatively correlated to a medium degree with nightmare distress, however this fell just short of significance ($r_s(28) = -.33$, $p = .09$) prior to adjustment for multiple comparisons.

There were two negative findings; there was little to no significant association between nightmare distress and severity of PTSD symptomatology ($r_s(28) = -.04$, $p = .88$) prior to adjustment for multiple comparisons. Lastly, there was a medium but non-significant positive correlation between hallucinations and nightmare distress ($r_s(28) = .33$, $p = .08$) prior to adjustment for multiple comparisons. When controlling for anti-psychotic medication this medium positive correlation fell just short of significance ($r_s(25) = .37$, $p = .06$).

Table 6. Spearman's rho correlation correlations of nightmare frequency and nightmare distress to daytime psychological functioning and daytime activity level measures.

		Nightmare Frequency (N=40)	Nightmare Distress (N=28)
Daytime symptomatology	Global Distress	0.35	0.47
	Hallucinations	0.15	0.33
	Delusions	0.15	0.59*
	Stress	0.24	0.53*
	Anxiety	0.27	0.53*
	Depression	0.53***	0.61*
	PTSD Symptom Severity	0.26	-0.04
Daytime activities	Daytime activities	-0.16	-0.33

*P<.05 after Hochberg's correction for multiple comparisons
***P<.001 after Hochberg's correction for multiple comparisons

3.5.5 Hypothesis 5: Nightmare frequency and nightmare distress exert independent effects on measures of sleep and daytime psychiatric symptomatology.

This hypothesis is supported (table 7). A medium negative correlation continues to exist between nightmare frequency and sleep efficiency ($r_s(24) = -.45$, $p<.05$) and nightmare frequency and total sleep quality ($r_s(24) = .53$, $p<.01$) after controlling for variance in both nightmare distress and anti-psychotic medication dose. Lastly, a medium positive correlation continues to exist between nightmare frequency and depression ($r_s(25) = .42$, $p<.05$) when controlling for nightmare distress.

Similarly, the significant associations found between nightmare distress and measures of sleep quality and daytime symptomatology continue to exist, when controlling for variance in nightmare frequency. A medium negative correlation continues to exist between nightmare distress and sleep efficiency ($r_s(24) = -.39$, $p<.05$) and medium positive correlation with total sleep quality ($r_s(24) = .45$, $p<.05$) when controlling for nightmare frequency and anti-psychotic medication dose. A large positive correlation continues to exist between nightmare distress and severity of delusions ($r_s(25) = .59$, $p<.001$). The variance in delusional severity accounted for by variance in nightmare related distress is 34.81% ($R^2 * 100$). A medium positive correlation exists between nightmare distress and both daytime stress ($r_s(25) = .49$, $p<.05$) and anxiety $r_s(25) = .48$, $p<.05$). A large positive correlation continues to be found between nightmare distress and depression ($r_s(25) = .50$, $p<.05$).

The number of nightmares reported by people with psychosis and the distress associated with them are both independently associated with both overall sleep quality and measures of depression, after controlling for shared variance. The proportion of variance in sleep quality explained by nightmare frequency ($R^2 * 100$) is 28.09%, whilst the proportion of variance explained by nightmare distress is 20.25%. Nightmare frequency accounted for 17.64% of the variance in depression scores, whilst nightmare distress accounted for 25.00% of the variance in depression scores.

Table 7. Partial correlations of nightmare frequency and nightmare distress to sleep measures and daytime psychiatric symptomatology, controlling for shared variance. Correlations including sleep efficiency, total sleep quality additionally control for variance in anti-psychotic medication. Numbers in brackets indicate the correlation coefficient before controlling for shared variance. Proportion of variance explained is calculated by R^2*100

		Nightmare Frequency (NF)	Proportion of variance explained by NF (%)	Nightmare Distress (ND)	Proportion of variance explained by ND (%)
Sleep	Sleep efficiency	-0.45* (-.52)	20	-0.39* (.48)	15
	PSQI	0.53** (.50)	28	0.45* (.50)	20
Daytime Psychiatric Symtpmatology	PSYRATS Delusions	0.01		0.59*** (.59)	35
	DASS-21 Stress	0.21		0.49* (.53)	24
	DASS-21 Anxiety	0.21		0.48* (.53)	24
	DASS-21 Depression	0.42* (.53)	18	0.50* (.61)	25

*P<.05
** P < .01
***P<.001

3.5.6 Hypothesis 6: Overall sleep quality will be negatively correlated with working memory. Furthermore it is expected that nightmare frequency will be negatively correlated with working memory.

This hypothesis was not supported. Overall sleep quality was not significantly correlated with working memory ($r_s(39) = -.19$, $p = .26$). Controlling for anti-psychotic medication made no difference to this result ($r_s(36) = -.06$, $p = .70$). Nightmare frequency was not significantly correlated with working memory ($r_s(39) = .02$, $p = .90$).

Given that earlier results indicated that nightmare distress was more associated with daytime symptomatology than nightmare frequency, exploratory analysis was undertaken to assess the link between nightmare distress and working memory. This revealed a large negative correlation between nightmare distress and working memory ($r_s(27) = -.50$, $p < .01$) which remained significant when controlling for variance in delusional severity ($r_s(24) = -.42$, $p < .05$) and depression ($r_s(24) = -.43$, $p < .05$), but not anxiety ($r_s(24) = -.36$, $p = .07$).

4. Discussion study A: Cross sectional study

Nightmares are characterised by awakening from rapid eye movement sleep with recollection of disturbing mental activity (Nielson & Levin, 2007). Frequent nightmares have been shown to impact on sleep architecture (Simor, Bodizs, Horvath and Ferri, 2013), suicidal thoughts and behaviours (Pigeon et al. 2012). In addition, nightmare distress was related to paranoia and affective symptomatology in a healthy student sample (Levin & Frieman, 2002). This is the first systematic investigation of nightmares within a sample experiencing symptoms of psychosis. The key result is that nightmares are a common problem for those with psychosis and found more often in this sample than the general population. Furthermore, the frequency of nightmares is associated with poorer sleep quality and the distress associated with them relates to both sleep quality and a range of daytime functioning: delusional severity, depression, anxiety and stress.

This chapter will present a summary of the findings from the cross-sectional study. Following this the current results will be placed within the context of existing literature and the clinical implications of the research will be outlined. Lastly, the strengths and limitations of the study will be considered.

4.1 Summary of the results

The key finding of study A is that over half (55%) of the participant group, selected on the basis of symptoms of psychosis, reported experiencing weekly distressing nightmares. Weekly nightmares are thought to reflect moderately severe pathology (Nielson & Levin, 2007). As predicted, weekly nightmares were significantly more frequent in the psychosis sample (55%) than figures reported in large non-UK based epidemiological studies (0.9-6.8%; Nielson & Levin, 2007; Li et al., 2010; Janson et al., 2005) and fortnightly nightmares were significantly more common in the sample (70%) than reported in a UK based study (42%; Blagrove et al., 2004). The higher frequency of nightmares in the psychosis sample was not associated with anti-psychotic medication dose.

As predicted, a higher frequency of nightmares was associated with both poorer sleep quality and poorer sleep efficiency (percentage of hours spent in bed spent asleep), after controlling for medication dose. There was one select link between nightmare frequency and daytime psychiatric symptoms; a large positive association was found between

nightmare frequency and depressed mood in patients. Nightmare frequency was not associated with measures of the severity of delusions, hallucinations, PTSD symptoms, depression, anxiety or stress and thus offered only partial support for hypothesis three. Instead, it was the distress associated with nightmares that better accounted for a range of daytime psychiatric problems. Large significant associations were found between nightmare related distress and measures of delusional severity, stress, anxiety and depression. There was a non-significant positive correlation between auditory hallucinations and nightmare related distress, which requires further investigation.

As predicted, nightmare frequency and nightmare distress exerted independent effects on measures of sleep and daytime psychiatric symptomatology. Nightmare related distress and nightmare frequency were both independently associated with overall sleep quality and sleep efficiency. Similarly, the distress related to nightmares and the frequency with which they occur were independently positively associated with depression. After controlling for nightmare frequency, a large correlation was found between nightmare distress and delusional severity and a medium correlation was found between nightmare distress and both stress and anxiety.

Lastly, contrary to expectations there were no significant associations between working memory and either overall sleep quality or frequency of nightmares. Instead there was a large significant negative correlation between nightmare distress and working memory which remained significant after controlling for variance in delusional severity and depression but not anxiety.

4.2 Comparison of results to existing research

4.2.1 The frequency of nightmares

Nightmare Disorder was found in 18.3% of those with Primary Insomnia (Ohayon et al., 1997) and 49% of those with BPD (Semiz et al., 2008). These reported figures fall slightly lower than the current sample with psychosis (55%). Although the measurement of nightmares was different in the current study, weekly distressing nightmares is generally accepted to reflect moderately severe pathology (Nielson & Levin, 2007; Levin & Fireman, 2002) and can therefore be considered an estimate of Nightmare Disorder.

With regards to PTSD, in which nightmares are a well established symptom of the disorder, 52% of participants in that study reported nightmares 'sometimes or more often' in the National Vietnam Veterans Study (Neylan et al., 1998). This is comparable to the 55% of the current sample with psychosis who complained of weekly nightmares. In a further study (Leskin et al., 2002), 71% of participants with PTSD 'complained of nightmares', though no frequency was specified. In the current sample 70% of participants complained of at least one nightmare over the previous fortnight, which is similar to the figure reported by Leskin et al., (2002). Despite differences in measurement method, the above results indicate that nightmares occur with similar frequency in this sample with psychosis when compared to samples with PTSD. The importance of this finding is highlighted by the fact that nightmares are one of the most commonly reported symptoms of PTSD (Nappi et al., 2010) and form part of diagnostic criteria (DSM-IV; APA, 2000), yet this is the first study to show that nightmares are also a common problem for those with psychosis.

4.2.2 The relationship between nightmares and sleep problems

In the current sample, nightmares were related to poorer overall sleep quality and poorer sleep efficiency. Although this is the first time nightmares have been associated with sleep difficulties in those with psychosis, it is not a novel finding in other populations. In a community based cohort from Hong Kong, Li et al. (2010) reported medium positive correlations between nightmare frequency and indices of poor sleep including: difficulties initiating sleep, difficulties maintaining sleep, early morning awakenings and restless sleep. In a separate study of those diagnosed with Primary Insomnia, co-morbid Nightmare Disorder was associated with increased night time awakenings and abnormally long sleep onset (Ohayon et al., 1997). Although the current result fits neatly with the literature implicating a link between nightmares and sleep quality, it is unclear what the direction of this effect is. Although it seems intuitive to think that nightmares might cause increased awakenings, it is equally as plausible that there is heightened dream recall frequency in those with poorer sleep (Li et al., 2010). This remains an area for further investigation.

The finding that those with psychosis have poorer sleep quality and sleep efficiency is not novel. Afonso et al., (2013) report that those with schizophrenia have poorer sleep efficiency, increased sleep latency and increased night time awakenings. Eighty five percent of the current sample had clinically relevant sleep disturbance and reduced sleep

efficiency. The current sample spent an average of 71% of their time in bed actually asleep. Despite using the same measure of sleep efficiency, this figure is lower than the 93% sleep efficiency reported in Afonso et al. (2013), though is closer to the 82% reported by Wulff et al. (2012).

A further difference when compared to Afonso et al.'s (2013) results is that there was no increase in total hours of sleep in the current sample. The current sample reported a mean of seven hours of sleep per night. This finding is in contrast to that of Afonso et al., (2013) in which those with schizophrenia were found to sleep for over nine hours. However, in the study by Wulff et al. (2012) their schizophrenia group slept for an average of eight hours. It is clear there is variability in sleep length and efficiency. Given that the current study found higher anti-psychotic medication dose to be associated with better sleep quality and sleep efficiency, this might be one cause. Furthermore, the frequency and distress of nightmares correlated with sleep quality and efficiency and might be an additional cause of large individual differences.

4.2.3 Nightmare distress and the link with daytime symptoms

The finding that nightmare distress better accounts for links with measures of daytime delusional severity, depression, anxiety and stress than nightmare prevalence has not been reported elsewhere in a sample with psychosis. The current results do however replicate those of Levin and Fireman (2002) who recruited a non-clinical sample. Levin and Fireman (2002) report that nightmare distress better accounted for the link with daytime symptomatology than nightmare frequency and that nightmare distress in particular was associated with depression, anxiety, psychoticism and paranoia.

A somewhat unexpected result is the lack of association between either nightmare frequency or distress and PTSD symptomatology. Given that nightmares and insomnia are regarded as a hallmark of PTSD (van Liempt et al., 2013), it was expected that PTSD severity would be related to nightmares. This was not the case. There are both theoretical and methodological interpretations of this result. Firstly, it is possible that nightmares are a common problem in those with psychosis in general, irrespective of PTSD diagnosis. This would result in elevated nightmares in those both with and without PTSD, thus making the additional diagnosis irrelevant. Freeman et al., (2013) reported that following an assault,

paranoia and post-traumatic reactions were correlated, and both disorders shared many of the same predictive cognitive factors. It is therefore possible that both disorders share such a trans-diagnostic problem as nightmares; this would be an area for further study. There were limitations to the method of measuring PTSD that might also have contributed to the non-significant result. This will be discussed within the limitations section.

4.2.4 The association between nightmare distress and working memory

It was surprising that overall sleep quality and nightmare frequency were not associated with working memory. This is contrary to the finding that rest activity cycle was the best predictor of frontal executive functioning (alongside age; Bromundt et al., 2011) and other findings relating sleep and cognitive performance (Keshavan et al., 2011; Wamsley et al., 2011). Instead, the current study revealed a large negative correlation between nightmare distress and working memory. This suggests that it is the affective quality of night time imagery (rather than sleep quality or frequency of sleep disturbance) that links with working memory. One plausible account for this link is Eysenck, Derakshan, Santos and Calvo's (2007) Attentional Control Theory that links anxiety and cognitive performance. This theory asserts that worry is the component of state anxiety that is responsible for poorer task performance, due to its propensity to consume limited attentional resources of working memory. This results in less working memory capacity, which in turn impedes performance. It is possible that nightmare distress and its association with anxiety symptoms reduces working memory capacity. This post-hoc hypothesis is supported by the finding that controlling for variance in anxiety resulted in a loss of the previously large negative correlation between nightmare distress and working memory. This explanation warrants further empirical testing.

4.3 Clinical implications

The results indicate that nightmares are a clinically relevant problem for just over half of this sample with symptoms of psychosis. Given their prevalence within this population, nightmares and sleep quality should form part of routine assessment of service users with psychosis. Assessment can be brief; asking service users how many nightmares they experience per week and how distressing they find the experience. Furthermore, given that nightmare related distress is associated with measures of delusional severity, depression, anxiety, stress and working memory nightmares should be considered as a

phenomenon that has consequences over and above the night time sleep experience. Nightmares are not short, discreet experiences but instead impact on the full 24 hour day.

The lack of association between nightmares and PTSD symptom severity suggests that clinicians should not assume nightmares to be related to past trauma. Instead nightmares may be highly distressing to the individual and be associated with worse daytime symptoms, but not as a result of a traumatic memory. In clinical practice, nightmares should be considered as a separate problem that can be co-morbid with a range of other diagnoses (Krakow, 2006). Indeed nightmares have been shown to be co-morbid with BPD (Semiz et al., 2008), Primary Insomnia (Ohayon et al., 1997) as well as PTSD (Leskin et al., 2002) and now psychosis.

4.4 Strengths and limitations

4.4.1 Sample

The male to female ratio of the sample was 1.59 : 1, consistent with the reported higher incidence of schizophrenia in males (McGrath, 2006). The age range spanned across adulthood from 18 to 68 and comprised a range of ethnicity that was broadly representative of a South London borough (Office for National Statistics, 2011).

Whilst attempts were made to obtain a representative sample of participants with psychosis from those engaged in services, there was no systematic sampling procedure used. The sample may therefore be biased in two ways, first towards those experiencing less functional impairment as a result of their psychosis and who would therefore be more inclined to take part. Second, recruitment may have been biased towards those who were experiencing difficulties with sleep. Potential participants were made aware that the study was investigating sleep processes through advertising material, where it was stressed that the study was aiming to recruit any person with psychosis, irrespective of whether they slept well, or had sleep difficulties. However, participants may have selected themselves on the basis that the research was relevant to their current difficulties. Further to this, 70% of the sample was recruited from one location, a specialist outpatient clinic providing CBT for psychosis. The majority had therefore received, or were waiting to receive psychological therapy. This figure is significantly higher than a recent report that stated

only one in ten people with psychosis received CBT (Schizophrenia Commission, 2012). The current findings should therefore be replicated in a larger representative sample.

With regards to symptom severity, the mean scores for depression anxiety and stress in the current sample were comparable to those reported elsewhere (Ison, 2011; Schulze, 2009; Huppert et al., 2002). With regard to symptoms of psychosis, measured by the PSYRATS questionnaire, delusional severity was broadly similar to other samples with psychosis (Schulze, 2009; Steel et al., 2007). The mean auditory hallucinations total score (mean = 23.41, standard deviation = 12.19) was within the standard deviation of a larger sample of 144 people recruited on the basis of symptoms of psychosis (mean = 27.6, standard deviation = 6.7; Steel et al., 2007). Individual sub-scale scores were compared to a recent study of 32 participants recruited based on their experience of auditory hallucinations (Hartigan, McCarthy-Jones & Hayward, 2013). This revealed that none of the sub-scales scores were significantly different to sub-scale scores from the current study (as indicated by overlap in reported standard deviations). Although there was no statistically significant differences, the majority of sub-scales in the Hartigan et al., (2013) study had a descriptively higher mean when compared to the current sample. The exception to this was the disruption to life, caused by voices, which was descriptively lower than the current sample. The above comparisons indicate that the severity of auditory hallucinations in the current sample are broadly in line with other samples of people with psychosis (Steel et al., 2007; Hartigan et al., 2013). The descriptively lower scores on some scales might be explained firstly by the fact that participants were not recruited on the basis of their voices and secondly that the participants may be better able to manage their voices, owing to the majority being recruited from a clinic providing CBTp.

With regards to trauma, the majority (90%) of the sample experienced at least one traumatic event, 30% had experienced CSA and just under half (43%) met criteria for PTSD. The rate of CSA is marginally lower than that reported in other samples (34-53%; Morrison et al., 2003), however the high rate of trauma is consistent with other research in which 100% of their sample had experienced at least one trauma (Shaw et al., 2002).

4.4.2 Design

There was no control group utilised in the current design. Instead, the frequency of nightmares was compared to the general population from figures reported within other published research studies. Given that the study was not a direct replication of those that it compared nightmare prevalence figures with; it is possible that the figures are not directly comparable.

A further limitation with the design of the study is that it was underpowered for some of the correlations undertaken, particularly with regards to nightmare related distress. Given that 45% of the sample did not experience any nightmares over the reference period, they were not asked about nightmare related distress. This reduced the sample size for this analysis. It is recommended that further investigations either include the presence of nightmares as an inclusion criteria in order that nightmare related distress can be measured for all participants, or a larger sample should be recruited.

Although the study controlled for anti-psychotic medication dose, it is possible that other medications impact on sleep. A recent systematic review has revealed that tricyclic anti-depressants and Phenalyzine can induce more positive dream emotions and that in some cases, withdrawal of such medication caused nightmares (Tribl, Wetter & Schredl, 2013). A future study might consider controlling for anti-depressant medication and asking about recent cessation of medications.

4.4.3 Measures

The psychometric properties of the log used to assess nightmares have not been formally established. Although the use of nightmare logs has been used extensively in other research protocols (Levin & Fireman, 2002; Robert & Zadra, 2008; Blagrove et al., 2004; Long et al., 2011) there was no validated measure to assess nightmares retrospectively. This is despite evidence that retrospective nightmare logs measuring up to one month in the past, yield similar frequency estimates to prospective measures (Robert & Zadra, 2008). This limitation calls for further development of nightmare measures for use in future investigations.

The lack of association between PTSD symptoms and nightmares was surprising. It is possible that this is a reflection of the measurement method for PTSD symptoms and the complexity of measuring the disorder in those with multiple traumas and co-morbid symptoms of psychosis. The PDS questionnaire asks participants to note all of their trauma experiences and then pick the trauma that bothers them the most in order to answer questions about PTSD symptoms. The mean number of traumatic events experienced was 3.2, (SD 2.9), however questions were answered in relation to just one of these traumas. It is possible that other factors impacted on their choice of trauma, e.g. which trauma they felt comfortable sharing with the researcher. Lastly, when asked about the impact of PTSD symptoms on daily living, some participants noted that their psychosis symptoms were the key reason for impairment. It might therefore have been challenging to consider whether PTSD related difficulties might have impacted on activities of daily living, given the context of more salient symptoms.

4.5 Conclusion

Weekly nightmares occurred in over half of this sample with psychosis. This finding is comparable to studies investigating the frequency of nightmares as a symptom of PTSD. Nightmare frequency and distress were independently associated with sleep quality and sleep efficiency. Nightmare distress was associated with severity of delusions, depression, anxiety, stress and working memory but had no association with PTSD symptom severity. Further research (powered to detect smaller associations) is required to establish whether auditory hallucinations are correlated with nightmare distress. This is the first study to show that nightmares are a frequent and clinically relevant problem for a diverse sample recruited on the basis of their experience of psychosis.

5. Methods – Study B

5.1 Ethical Approval

Similarly to study A, the study was reviewed and approved by the City Road and Hampstead NHS Research Ethics Committee (11/LO/2045). The Research and Development department at South London and Maudsley NHS Foundation Trust (SLaM) granted approval for recruitment in community teams, the Psychological Interventions Clinic for Outpatients with Psychosis and inpatient wards. Approval was additionally granted from the SLaM Psychosis Clinical Academic Group (CAG). The Research and Development Department at Oxleas NHS Foundation Trust granted approval to recruit via Early Intervention Teams.

5.2 Design

A non-consecutive case series design was utilised. All participants undertook a baseline assessment before completing the intervention (Imagery Rehearsal Training). After the intervention, participants completed follow up assessments and a final follow up telephone call.

5.3 Recruitment

Participants for the case series (study B) were recruited from the 40 participants who completed study A. Recruitment for study B commenced in July 2012, four months after recruitment for study A. Of the 40 participants who took part in study A, 22 experienced nightmares with a frequency that was at least weekly. Twenty of the 22 (90.9%) expressed an interest in being contacted about study B. Three of the total were excluded due to the nightmares not being moderately distressing (n=1), having difficulty reliably attending the appointment for study A (n=1) and not being able to remember the content of nightmares (n=1). Seventeen participants were therefore interested and eligible to take part in study B. Participants were chosen on the basis of frequency of nightmares as well as date of assessment of study A; those first assessed were invited first. Seven of these participants were invited to attend study B; six of these seven continued to experience distressing nightmares and all six agreed to attend a research appointment for study B (figure 10).

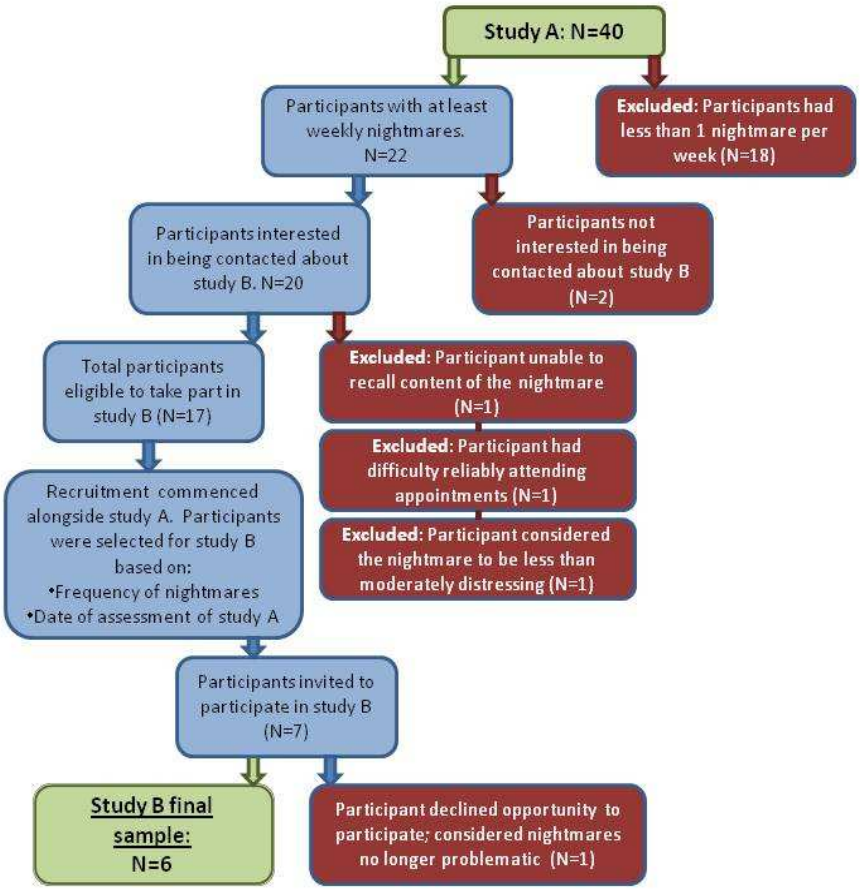

Figure 11. Recruitment flow chart; route to participation in study B from initial pool of 40 study A participants.

5.4 Inclusion Criteria

Inclusion criteria for taking part in the case series were:

1. To have completed all questionnaire measures from study A
2. To experience nightmares of at least weekly frequency (≥2 nightmares over past two weeks reported on Dream Log for study A)
3. Nightmares to be rated at least moderately distressing (≥4 on the distress scale of Dream Log for study A)
4. Able to give informed consent to treatment.
5. Recollection of the content of the nightmare.

5.5 Measures

Participants had already completed all questionnaires for study A. These are described in detail in chapter two, (section 2.4) Recruitment for study B was planned to occur alongside study A, in order that data from study A could act as a baseline. However in many cases this was not possible due to local R & D approval processes for study B being delayed. For this reason, the following measures were repeated in session one of study B: PSYRATS, CORE-10, Pittsburgh Sleep Quality Index. The DASS-21 was additionally completed where time permitted.

5.5.1 Dream Log for Study B. Adapted from dream logs used by Levin & Fireman (2002).

Participants were sent a prospective dream log in order to record their nightmares, the week prior to session 1. Each morning participants were asked to record if they had experienced a nightmare. If they had, they were asked how many nightmares they recalled over the night and were asked to answer four further questions based on their worst nightmare. Participants rated the chosen nightmare on a seven point likert scale for intensity, vividness and distress engendered. Lastly they were asked whether they had experienced that chosen nightmare before.

5.5.2 The Voice Power Differential Scale (VPD; Birchwood, Meaden, Trower, Gilbert & Plaistow, 2000)

Where participants had indicated that they hear voices, they were asked to fill in the Voice Power Differential Scale (VPDS; Birchwood et al., 2000). The VPD assesses the power differential between the voice and the voice hearer through seven dimensions: power, strength, confidence, respect, ability to inflict harm, superiority and knowledge (Birchwood et al., 2000). Each dimension is measured on a five point likert scale, for example for the dimension of power, "1 = I have much more power than my voice", "3 = We have about the same amount of power as each other" and "5 = My voice is much more powerful than me". Scores on the seven dimensions of power are summed together. The scale has been shown to have good internal reliability (cronbach's alpha = 0.85) and good one week test-re-test reliability (r = 0.82; Birchwood et al., 2000).

5.5.3 Persecutor Power Differential (PPD; Adapted from the VPD; Birchwood, Meaden, Trower, Gilbert & Plaistow, 2000)

The Persecutor Power Differential Scale has been adapted from the VPD. It assesses the same seven power dimensions of the VPD (power, strength, confidence, respect, ability to inflict harm, superiority and knowledge), though wording of the items is changed so that voice is replaced with a persecutor. The psychometric properties of the scale have not been described.

5.5.4 Subjective Units of Distress (SUDs)

Each week participants were asked to describe their level of distress over the past week on a ten point scale (1 = not distressed, 10 = very distressed). They were similarly asked to rate their fear of their nightmares on a ten point scale (1 = not fearful, 10 = very fearful). This was introduced as a standard part of the weekly review for the 2nd to 6th participants following qualitative feedback on changes from participant one.

5.6 Procedure for Study B

Upon being invited to take part in study B participants were sent an information sheet. Participants were advised that in the first assessment session they would be asked detailed questions about their nightmares and for this reason it would be helpful for them to make a note of nightmares the week preceding the assessment. They were sent the Dream log for study B to assist with this process.

The method of Imagery Rehearsal was adapted from that used by Nappi, Drummond, Thorp & McQuaid, (2010). Participants required between four and six sessions in order to complete the protocol. The increased session number was judged on the basis of clinical need.

5.6.1 Phase one

Participants were offered a further opportunity to read the information sheet and informed consent was taken. It was explained to participants that information shared through the research would remain confidential, unless the researcher became concerned regarding

the safety of the participant or those around him/her. Where necessary, clinical teams were contacted regarding risk issues and in all cases this was discussed and agreed with participants during the research session.

Given that there was an unplanned delay between participants completing study's A and B, some core measures from study A were repeated. Participants therefore completed the CORE-10, the PSYRATS for delusions and hallucinations, the Pittsburgh Sleep Quality Index and the Dream Log for Study B. Four of six participants had completed the dream log prospectively through the preceding week.

Participants were provided with psychoeducation to normalise their experience of nightmares. Topics included the prevalence of nightmares in the general population, normalising strong emotional reactions to vivid negative content and discussion about possible causes of nightmares (related to life experiences or idiopathic). In some cases, the basic architecture of sleep cycles was discussed in order to normalise night time awakenings. The method of Imagery Rehearsal was introduced with regards to first, creating an alternative script for the ending of the nightmare, second, elaborating the script to include detailed sensory information through imagery and lastly, the need to practice the re-script.

Participants were asked to provide a very brief description of each of their current distressing nightmares. Participants were asked to pick one nightmare with which to target with the intervention, ideally their most distressing nightmare or the worst they felt they could tolerate. The target nightmare was described by the participant and summarised by the researcher on a scene by scene basis. Participants rated the scenes according to distress and the place to insert the re-script agreed; just before the point of maximum affect. The participant and researcher together considered alternative neutral or positive endings to the nightmare. Once the ending was agreed in principle the participant engaged in guided imagery. Detailed techniques for evoking imagery are described in Hackmann, Bennett-Levy and Holmes (2011).

Participants were encouraged to close their eyes (if they were comfortable with this), find a comfortable position and take a few deep breaths. Participants were prompted to imagine

the beginning of the dream and describe the scene in the first person, present tense. They described the event of the nightmare, including sensory detail, thoughts and feelings. They were prompted to move on to the next event in the re-script if this did not occur naturally through their description. The level of guidance and prompting throughout the imagery work was tailored to the needs of each individual. The researcher noted changes in posture and facial expressions in addition to verbal reports of feelings as a means of monitoring affective changes. At the end of the imagery participants were asked to sit with the positive emotion and then 'return' to the room.

Participants were asked to feedback their experience of the process, and particularly to changes in affect throughout the course of the script. Adjustments were made to the script where necessary, for example if the person did not feel any anxiety through the imagery, did not feel their anxiety alleviate upon imagining the re-scripted ending or that the re-scripted ending appeared too unbelievable.

5.6.2 Letter and CD

A transcript of the re-scripted nightmare, written in the first person, was sent to the participant in the post. In addition, a voice recording of the transcript, described in the second person tense was recorded onto CD. Participants were encouraged to practice reading or listening to the re-script at least once per day, preferably prior to going to bed.

5.6.3 Phase two

In the session that followed (usually one week later), nightmares over the previous week were re-assessed in terms of frequency, changes in the nightmare content and the emotional reaction to the nightmare. Participants were asked to rate how distressed they had felt over the past week and how fearful they currently felt of their nightmares (SUDs scale). The researcher enquired about the frequency of practice and facilitated problem solving the barriers to practice. Adaptations to the re-script were made where necessary and the new rescript rehearsed through the imagery technique described above. In these cases, a new rescript letter and CD followed in the post.

5.6.4 Phase three

A reassessment of nightmares took place with regard to frequency, content, changes in nightmare content and emotional reaction to the nightmare. Participants were asked to rate how distressed they had felt over the past week and how fearful they currently felt of the target nightmare (SUDs scale). Participants completed the follow up questionnaires. These included the Pittsburgh Sleep Quality Index, the PSYRATS for hallucinations and delusions, the VPD (for those participants hearing voices), the PPD (for those participants who experienced persecutory delusions), the DASS-21, the CORE-10, the PDS and Time Budget questionnaire. The order of completion of these questionnaires remained consistent across participants and was broadly consistent with study A. The only exceptions to consistency with study A was the addition of the VPD the PPD, as well as and the dream logs being completed outside of session.

Participants were given a dream log to complete over the following week, with a stamped addressed envelope to send back to the researcher. They were advised that they would receive a follow up telephone call approximately two weeks later. Participants rated their satisfaction with sessions on a ten point scale (1=not satisfied at all, 10=very satisfied) and were asked for feedback on what they would change with regard to the sessions.

5.6.5 Follow up telephone call

Participants were asked to rate how distressed they had felt over the past week and how fearful they currently felt about the target nightmare (SUDs scale). Participants' nightmares were reassessed with regard to frequency, content, changes in nightmare content and emotional reaction to the nightmare. Participants were thanked for their participation and reminded that a copy of the study's key results would follow through the post, if they had expressed an interest on their consent form.

5.6.6 Adaptations of IR for a psychosis population

The protocol was adapted from that of Nappi et al., (2010) with the following key adaptations:

1. The (optional) provision of a CD with an audio recording of the rescript. The rationale for this was to enable those who hear voices an alternative and more accessible means of script rehearsal.

2. The session number and length was flexible, as per recommendations in a CBTp manual (Fowler et al., 1995). The rationale for this was in order to provide an individualised approach to therapy, given that the content of nightmares and possible impact of psychotic symptoms was unknown at commencement of therapy.
3. All participants received IR in individual (as opposed to group) therapy format.
4. Increased time was spent planning the alternative ending of the nightmare script. Participants required substantial therapist input in order to facilitate this process (particularly when nightmares were based on real experiences).

5.6 Analysis

Each participant is described in detail to illustrate their path through the intervention. Qualitative feedback regarding changes in their nightmares and satisfaction with the intervention will be described. Following this quantitative measures of nightmares, psychotic and affective symptomatology shall be reported on. Analysis of quantitative measures shall include both descriptive changes and analysis using the Reliable Change Index (RCI; Jacobsen & Truax, 1991).

Reliable change refers to the extent to which change from pre-intervention to post-intervention falls beyond what would be expected on the basis of measurement variability. For this reason, the equation uses test-re-test reliability of the measure itself, as well as a measure of the variance of the sample (standard deviation). The reliable change criterion is 1.96 times the standard error of the difference (Evans, Margison & Barkham, 1998). If the participant falls beyond the reliable change criteria specified, it can be concluded with 95% certainty that they have evidenced a statistically reliable change in score, rather than that change occurring due to chance. The equation is as follows:

$$\boldsymbol{SE_{diff} = SD_1 \sqrt{2} \sqrt{1 - r}}$$

SEdiff refers to the standard error of the difference, **SD** refers to the standard deviation of baseline observations and ***r*** refers to reliability. In the current investigation test-retest reliability was used. Test-retest reliability data was obtained from: Buysse et al., (1988), Drake et al., (2007), Birchwood et al., (2000), Foa et al., 1997, Jolley et al., (2005) in order to calculate the reliable change criterion as specified in table 8. The standard deviation was

taken from the baseline measure of the five participants. Whilst this is a small sample from which to derive the standard deviation, there are no other published studies reporting standard deviations for these measures in those with both psychosis and sleep disturbance. Whilst this criterion indicates statistical significance, it should be noted that it does not by itself indicate clinical significance.

Table 8. Test-retest reliability, baseline standard deviation and reliable change index criterion for scales

Scale	Test-retest reliability	Baseline SD	RCI (95% confidence)
PSQI	.85	5.34	6
PSYRATS Delusions	.70	1.87	3
PSYRATS Hallucinations	.70	2.86	4
Voice Power Differential Scale	.82	4.32	5
PDS	.83	6.08	7
Time Budget Questionnaire	.83	21.87	25

6. Results – Study B

This chapter will report on the results from the case series of Imagery Rehearsal; study B. Each of the six participants will be individually introduced and their current experience of nightmares described. Following this their intervention will be reported on alongside qualitative descriptions of outcome. Lastly, quantitative markers of change will be reported. The names and some details have been changed in order to retain anonymity.

6.1 Participant 1; "Chrissie" (4 sessions,3 of which were intervention sessions)

6.1.1 Presentation at Baseline

Chrissie was a black British female in her forties. She lived independently, received support from a formal carer and had a supportive son and grandchildren. Chrissie had a diagnosis of paranoid schizophrenia and had been experiencing symptoms for ten years. She reported hearing a voice who spoke to her almost continuously and visual hallucinations that she described as shadows. She had beliefs that people were talking about her and looking at her strangely. She held 75% conviction in this belief at baseline and found it markedly distressing. Chrissie also met criteria for a diagnosis of PTSD, in relation to experience of childhood sexual abuse.

6.1.2 Assessment of Nightmares

Chrissie had experienced seven nightmares in the week prior to study B. She described three key recurrent nightmares that had death as their main theme. Her first nightmare involved a one legged dancer pirouetting, with blood spilling out of the place where the leg was missing, her second nightmare was of an animal circling around a church steeple. Chrissie had experienced the animal nightmare since she was a child. Her last nightmare was the one chosen for the intervention and involved people in her life who had passed away scratching at a coffin.

Chrissie considered that her target nightmare was triggered by daytime thoughts. She had tried distraction strategies before going to sleep, however her sleep was still interrupted by her chosen nightmare 2-3 times per week. Chrissie achieved an average of 3-4 hours sleep per night (despite taking sleep medication nightly). Chrissie's target nightmare is summarised in figure 11. It was related to two difficult memories.

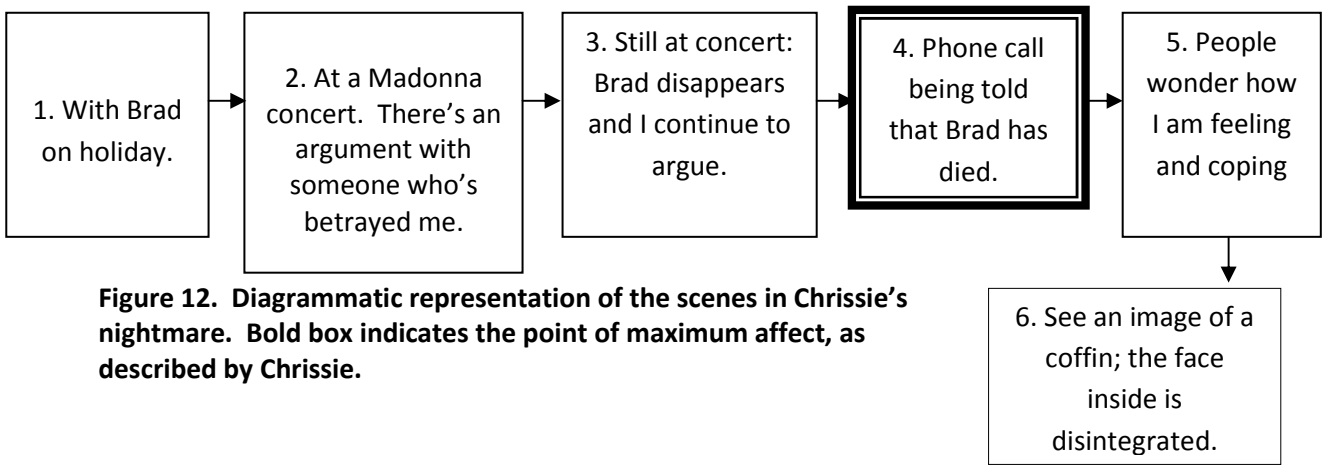

Figure 12. Diagrammatic representation of the scenes in Chrissie's nightmare. Bold box indicates the point of maximum affect, as described by Chrissie.

6.1.3 IR

In order to create a script which related enough to the original nightmare and which had a sufficiently positive ending, the script went through a design process of three phases (Figure 12). At each stage Chrissie elicited the detail of the script via imagery in session and listened to a CD of the script each night in between sessions.

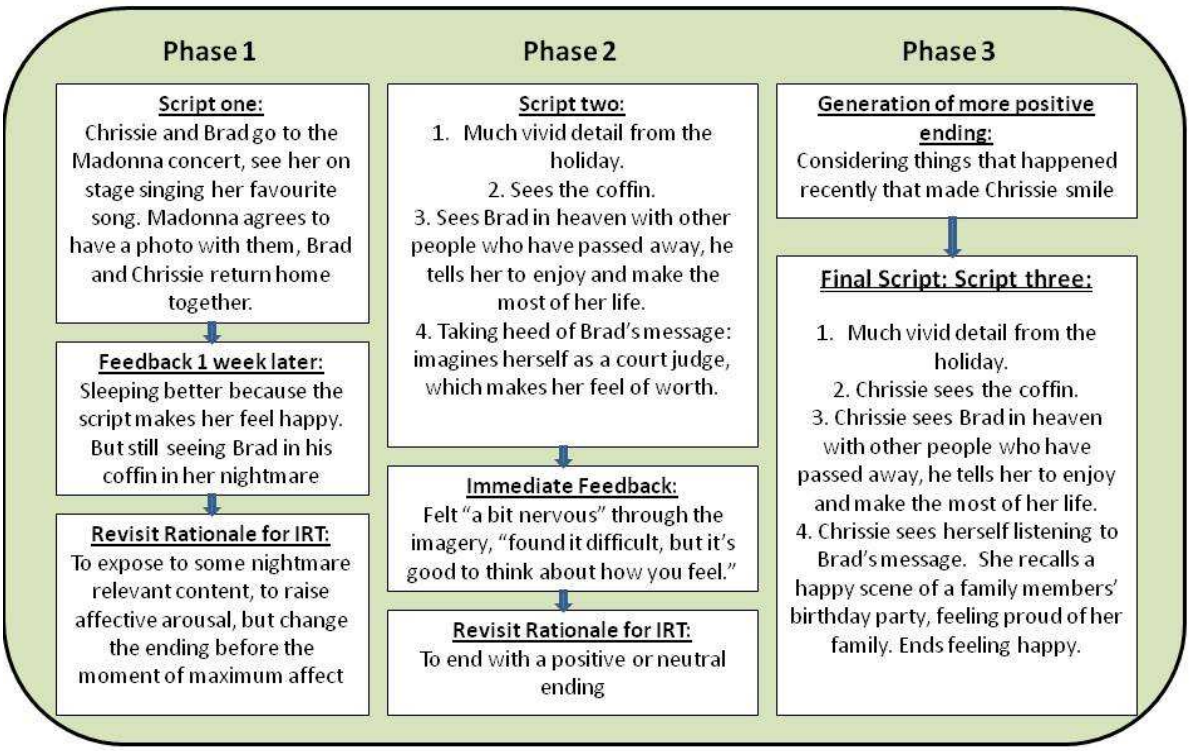

Figure 13. Diagrammatic representation of the re-script in three stages of development alongside rationale for further amendments.

6.1.4 End of session feedback:

Chrissie reported feeling less fearful of her dreams. When they did occur, she reported waking up and reading her script as a coping strategy; "I read the script and get good thoughts". She hadn't seen the image of the disintegrating face in the coffin over the past week of using the script. Chrissie reported that although Brad still occurs in her dream content, she wakes up smiling. Chrissie reported feeling 10/10 satisfied with sessions and considered that they could be improved by adding relaxing sounds in the background of the CD recording and by adding a coffee machine for participants.

6.1.5 Two week follow up telephone call:

Chrissie reported that she had not seen the disintegrating face in the coffin since the last session. Brad still featured in her dreams but she reported feeling better able to cope. As such, Chrissie reported feeling more in control. She reported that she still listened to the CD before going to bed and still read the script as a coping strategy in the event of a nightmare.

6.2 Participant 2; "Nick" (4 sessions,3 of which were intervention sessions)

6.2.1 Presentation at Baseline

Nick was a young male student. He met criteria for PTSD in relation to childhood sexual abuse. He had a diagnosis of unspecified non-organic psychosis and experienced hearing voices for over five years; one of whom commanded him to hurt himself and other people. Nick also had beliefs in telepathy and psycho-kinesis which he had held for approximately one year. He held 100% conviction in these beliefs and they caused him moderate levels of distress. At the time of commencement of the case series, Nick had experienced some changes in his accommodation and started a new episode of study. He was receiving CBT for psychosis alongside the intervention.

6.2.2 Assessment of Nightmares

Nick had experienced eight nightmares in the week prior to study B. He described three key recurrent nightmares; the first he described as 'green liquid', the second involved

people being violent to him and the third nightmare was related to traumatic life events. Although the second and third nightmares were the most frequent, he felt that the first nightmare (green liquid) was the most distressing and therefore chose this one for the intervention (see figure 13). This was somewhat related to traumatic memories.

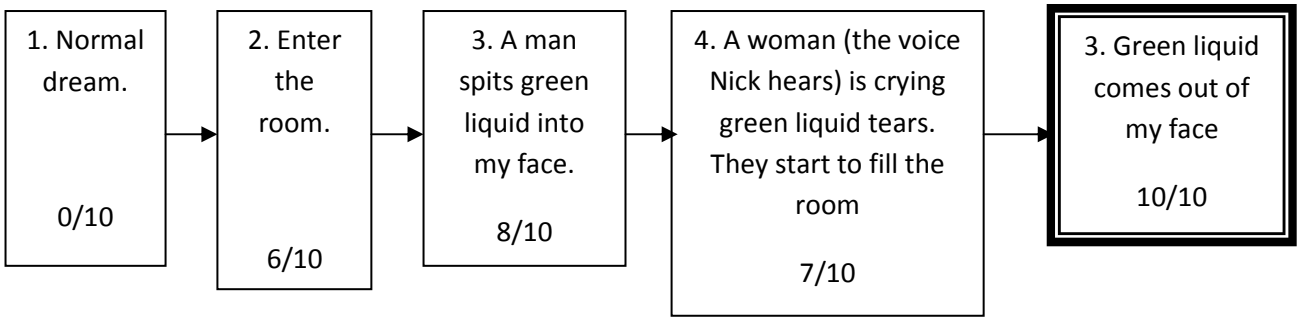

Figure 14. Diagrammatic representation of the scenes in Nick's nightmare. The fractions indicate level of distress; 0=no distress, 10=couldn't feel more distressed. Bold box indicates the point of maximum affect, as described by Nick.

6.2.3 IR

The pre-planning stage (prior to imagery) was particularly important in order to decide on a helpful ending for the script in which Nick did not experience the feeling of being infected (as he did in the original nightmare). Below is a list of options explored:

- Hold the liquid back with the power of mind → Therapist trying to avoid methods related to psychotic beliefs
- Burning off the liquid → Therapist trying to avoid acts of aggression to self / others
- Create a barrier
- Find an escape route
- Clean or dissolve the liquid

Could not comprehend them working; 'didn't *feel* right'

- Visualise the liquid as if it is treacle or molasses
- Black liquid hardens and shatters → Chosen for re-script

The script went through a design process of two phases (figure 14). At each stage Nick elicited the detail of the script via imagery in session and read the script in between sessions. Within sessions Nick reported that his voices had worsened. He reported his voice telling him to harm the therapist and that as a result it was difficult to engage in

imagery. This was a difficulty he had reported with previous therapists. Nick's care team were contacted to facilitate risk assessment and help management this risk. At the end of the sessions Nick reported that he was feeling angry following his nightmares. Nick was therefore offered two follow up sessions to work specifically with the angry feeling he was left with. Nick agreed to further sessions, however, due to difficulties with study commitments as well as fluctuation in his mental health he was unable to attend.

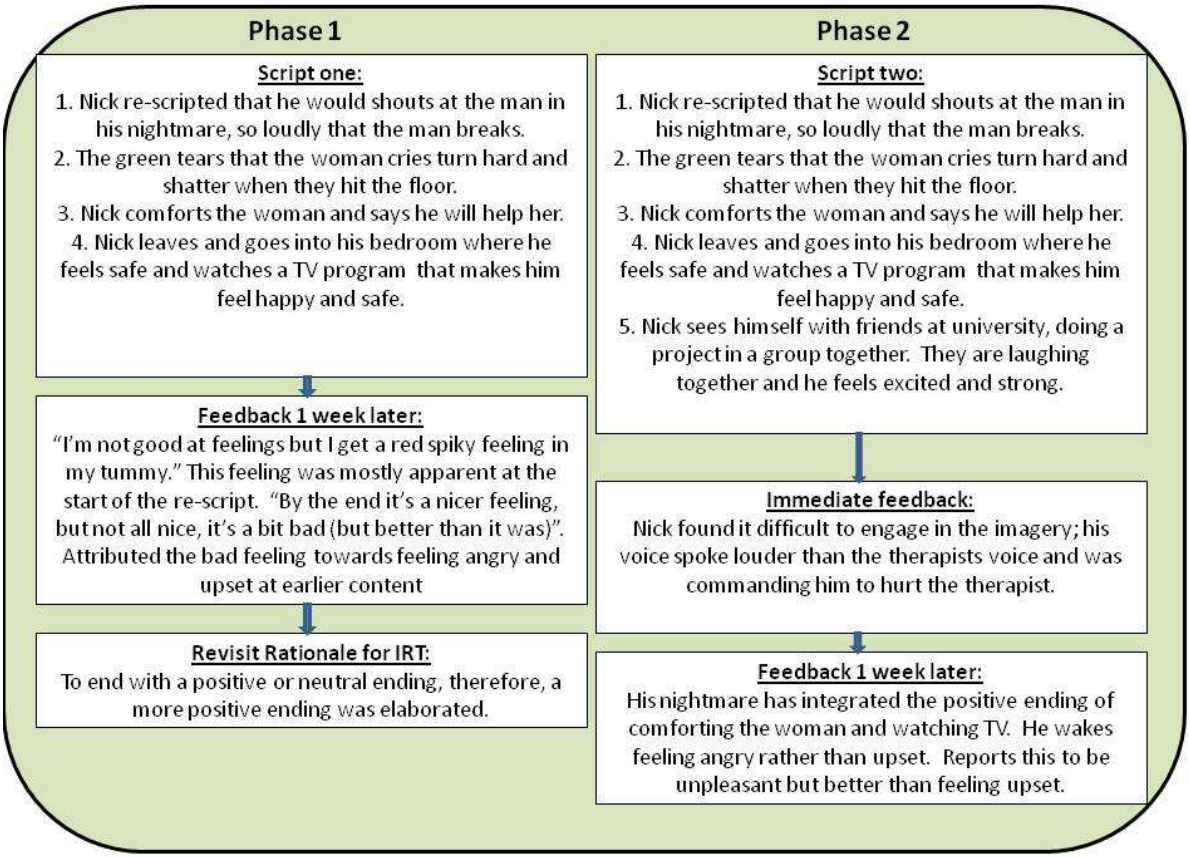

Figure 15. Diagrammatic representation of the re-script in two stages of development alongside rationale for further amendments.

6.2.4 End of session feedback:

Nick reported that the nightmare content had changed slightly in his target nightmare; his nightmare now integrated him hugging the woman (his voice) and him ending in his bedroom watching the television, as per his re-script. Nick reported that the nightmare

was now more disjointed and not a "linear" story. The worst part of his dream in which the green liquid gets to him was still occurring; he rated this part 7/10 distressing. At the first session Nick rated this 10/10 distressing.

Nick reported that his emotional response to his nightmare was that he felt angry after the nightmare. This contrasts to his previous reaction in which he felt frightened. Although this was still a negative emotion, Nick considered that he would prefer to feel angry than frightened. Nick reported that one of his other key nightmares had also taken on a more angry tone.

Nick suggested that he was no less fearful of his nightmares. He felt 7/10 satisfied with the sessions. Nick did not consider that there was anything within the researcher's control that could have improved his satisfaction with sessions, but acknowledged that his voice had made it challenging to engage in the imagery.

6.2.5 Two week follow up telephone call:

Nick reported that he was still left feeling angry after his nightmares. He reported that the worst part of his nightmare in which the green liquid comes out of his own body, no longer happened on every occasion. With regard to nightmare frequency, Nick suggested that he was "not having as many bad ones", but his three recurrent nightmares were still happening and he was having "little random ones".

6.3 Participant 3; "Elaine" (5 sessions, 4 of which were intervention sessions)

6.3.1 Presentation at Baseline

Elaine was a white British lady in her fifties. She lived independently and had previously been engaging in voluntary work, though had stopped due to a recent deterioration in her mental health. She reported feeling depressed and hopeless at the outset of therapy, accompanied by suicidal ideation. She had no suicidal plans but rather thoughts such as "maybe it wouldn't be so bad". She rated her level of distress in the first session as 9/10 (1=not distressed, 10=very distressed). Elaine met criteria for PTSD in relation to an event

in which she found her brother who had committed suicide. Elaine had experienced voices as well as visual, olfactory and tactile hallucinations since late childhood. She also held the belief that she had the power to make bad things happen, which was accompanied by marked distress.

6.3.2 Assessment of Nightmares

Elaine had experienced six nightmares in the week prior to study B. She described three key nightmares; in the first, she walks around a large house knowing that there is something beneath the floorboards and has a sense of 'foreboding'. She had experienced this nightmare since her early twenties. The second nightmare she had since a teenager and involved a witch waiting in a van to take her away. The last nightmare was most distressing and chosen for the intervention. This nightmare related to her brother and nephew committing suicide in close succession four years previously (see figure 15). She had experienced this recurrent nightmare since that time.

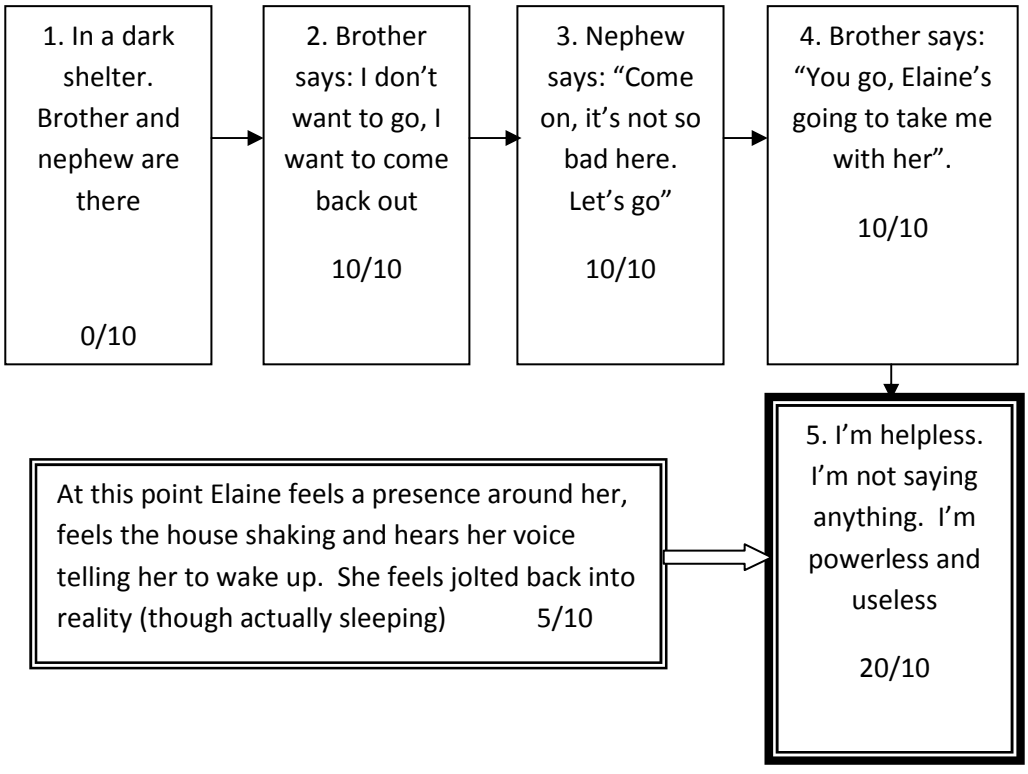

Figure 16. Diagrammatic representation of the scenes in Elaine's nightmare. The fractions indicate level of distress; 0=no distress, 10=couldn't feel more distressed. Bold box indicates the point of maximum affect, as described by Elaine.

6.3.3 IR

Elaine had difficulty comprehending how the ending of her nightmare could be different, given that it was largely based on a real life experience. Elaine was therefore offered additional time to plan an ending that would not invalidate her past experiences (see figure 16).

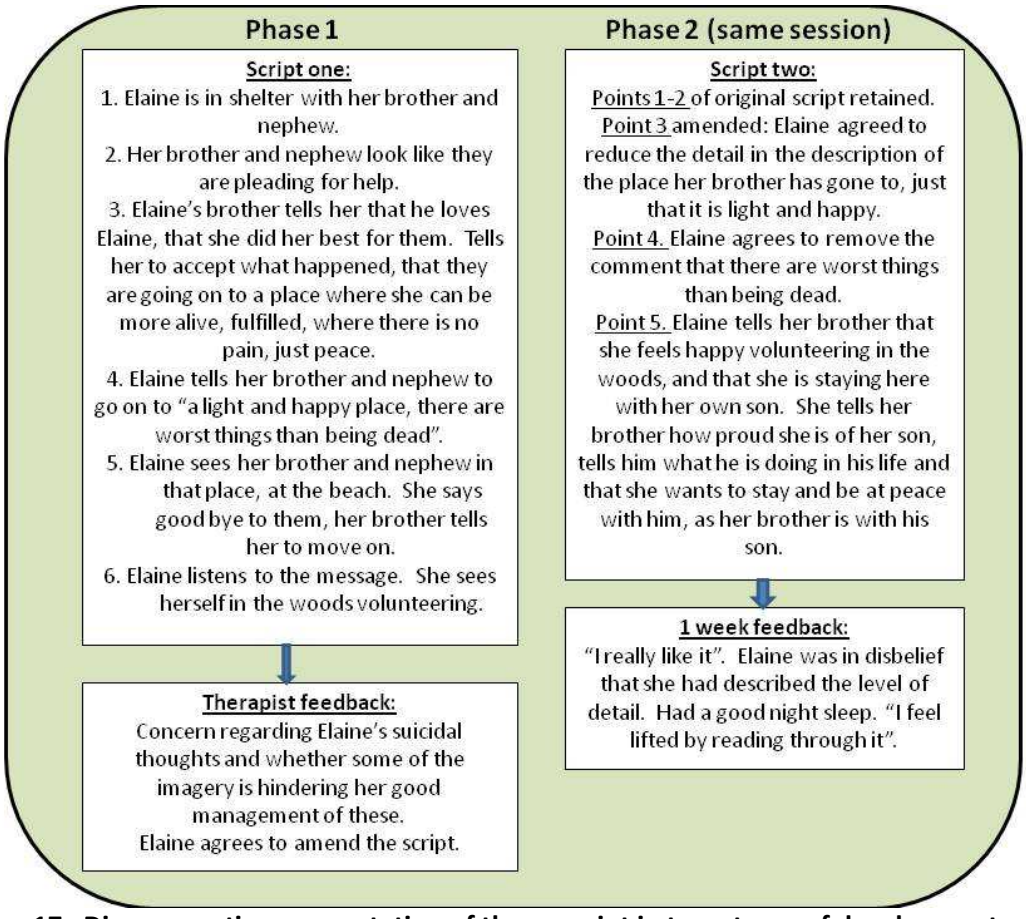

Figure 17. Diagrammatic representation of the re-script in two stages of development alongside rationale for further amendments.

Despite a plan of the script being drawn out prior to the imagery, the imagery exercise itself revealed a significant level of detail in the images of where her brother would be, after committing suicide. This was not interrupted within the process of imagery but the therapist reflected upon the helpfulness of these given that Elaine would be reading the script each night and had herself been struggling with suicidal thoughts. She agreed to amend the script.

6.3.4 End of session feedback

Elaine's reported fear of her nightmares had reduced to 6/10 (previously 10/10). She was 10/10 satisfied with the sessions and considered they could only be improved by using the same research room each week. Elaine had experienced one nightmare over the week preceding the follow up assessment. This nightmare was the target nightmare. Despite not being able to get back to sleep after the nightmare she explained that she did not wake up in terror as had previously occurred. In addition, she was no longer affected by the nightmare through the day, whereas previously the nightmare had "ruined my day". Elaine considered that the reason she reacted differently to the nightmare was because the memory of the event had been "deconstructed" through the session and "put back together"; she now reported there was nothing more she could have done to help her brother. She described that the end of the re-script reinforced to her where her brother should be and where she herself wanted to be. As such, she had not experienced any suicidal thoughts and had reengaged in voluntary work.

6.3.6 Two week follow up telephone call

Elaine reported that she was still using the script approximately twice a week and that she had experienced her target nightmare, but less frequently. There had been one occasion when the nightmare had been "as horrendous" but on the whole the nightmare was less vivid, less clear and less intense; it had more colour, was less dark with regards to what she saw visually and how she felt. With regards to other nightmares, Elaine had not had her nightmare involving the floorboards, which was unusual for her (this was a frequent nightmare), but had experienced her nightmare involving being taken away in a van.

6.4 Participant 4; "Roland" (4 sessions, 4 of which were intervention sessions)

6.4.1 Presentation at Baseline

Roland was an African gentleman in his thirties. He had a diagnosis of paranoid schizophrenia. He did not report hearing voices, but had a belief that images were being inserted into his head which he held with 50-99% conviction. Roland's chief concern was frequent nightmares. Roland disclosed no significant trauma history on the PDS, however

it was known that he grew up in an East African country amidst political unrest and warfare. Roland rarely offered eye contact through sessions; he spoke slowly, with a flat intonation to his voice and offered short answers.

6.4.2 Assessment of Nightmares

Within study A, Roland reported experiencing an estimated 40 nightmares over the past 14 nights. He had reported having nightmares that occur along a similar theme; they usually involved his mother. The most distressing nightmare involved him going into a room where he sees his mother naked with a penis. This nightmare left him feeling sad and weak.

At the assessment session of study B Roland had completed the dream log prospectively which summed 67 nightmares over the preceding week, none of which were recurrent. He was 9/10 fearful of his nightmares, 10/10 scared of falling asleep and felt 8/10 distressed over the week prior to assessment. He was no longer troubled by nightmares involving his mother and reported difficulties recalling his nightmares. He reported experiencing no sleep at all; however after enquiry as to when his nightmares occurred he considered that he had likely slept for around thirty minutes per night. Roland had distressing images through the day and at night; it was therefore difficult for him to distinguish whether he was asleep. Roland's bedtime routine involved him watching television, having a cup of tea, getting into bed and thinking about rest.

Roland was able to describe two recent nightmares that he had found distressing. The content of the nightmares had little story, but rather appeared to be more discreet images. There were therefore no points of maximum affect. One of these is illustrated in figure 17 below.

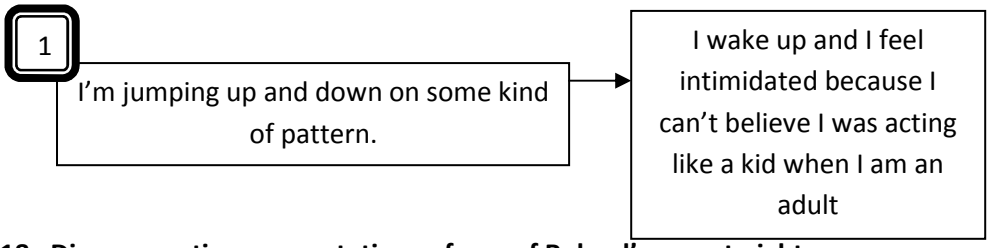

Figure 18. Diagrammatic representations of one of Roland's recent nightmares.

Roland noted his nightmares between sessions one and two and brought a more detailed nightmare which was chosen as his target nightmare (figure 18).

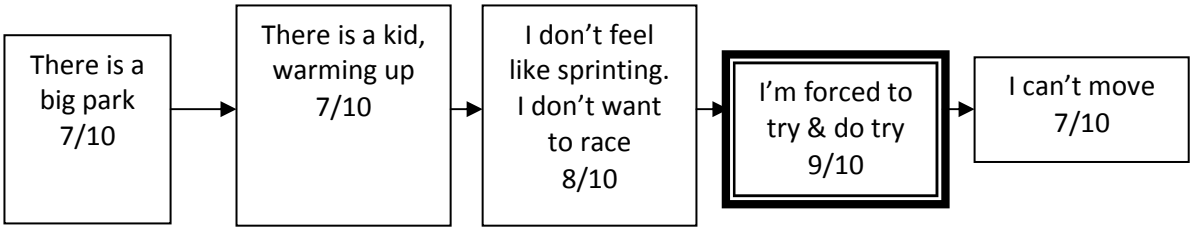

Figure 19. Diagrammatic representation of the scenes in Roland's nightmare. The fractions indicate level of distress; 0=no distress, 10=couldn't feel more distressed. Bold box indicates the point of maximum affect, as described by Roland.

6.4.3 Nightmare themes

Given there were no recurrent nightmares it was hoped that by picking one target nightmare that represented the theme of control (running the race), this might impact on Roland's feeling of control and might generalise to more than one nightmare.

6.4.4 IR

Roland's progress and feedback through the sessions is summarised in figure 19.

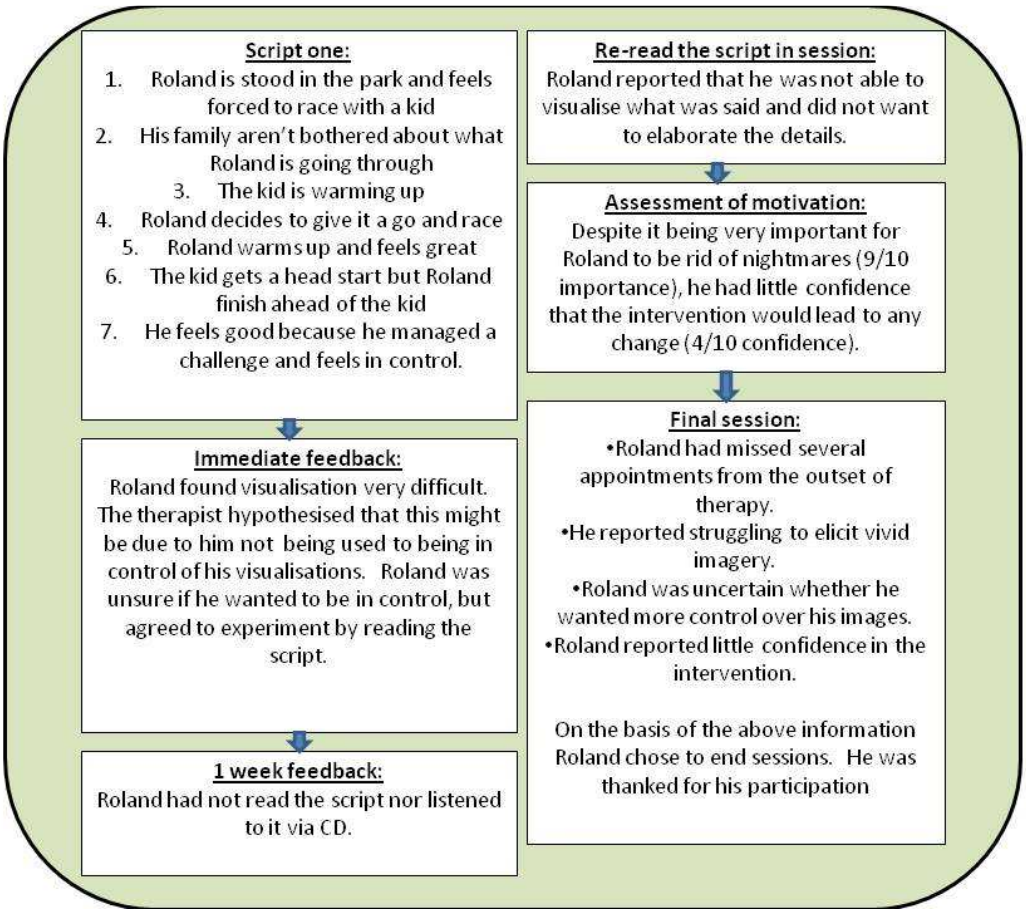

Figure 20. Roland's progress through the intervention, including feedback.

6.4.5 Last session

Roland reported that there had been no change in his nightmare frequency as a result of the four sessions he had attended.

6.4.6 Two week follow up telephone call

Roland did not consider that his nightmares had changed in neither content nor frequency; however, he did feel slightly better able to cope with them.

6.5 Participant 5; "Louise" (4 sessions, 3 of which were intervention sessions)

6.5.1 Presentation at Baseline

Louise was a white British lady in her forties. Louise had previously achieved a high level of education, despite having symptoms of psychosis since she was a teenager. She experienced command hallucinations telling her to hurt others, though had never followed their commands. She had completed previous CBTp to help manage these. In addition Louise experienced visual hallucinations of shadows, olfactory hallucinations and tactile hallucinations. Louise experienced distressing persecutory delusions. Louise grew up with domestic violence; however she did not report any PTSD symptoms. Louise had developed strategies to deal with her voices, through previous sessions of CBT for psychosis. Louise had been a high achiever until becoming unwell. At the time of assessment she was engaged in part time employment. She lived independently in a flat which she had enjoyed decorating with bespoke furniture.

6.5.2 Assessment of Nightmares

Louise had experienced one nightmare over the week prior to assessment, which she chose as her target nightmare. This was a recurring nightmare which occurred around three times per month and related to when she started a job and had been experiencing symptoms of psychosis, which had not been formally diagnosed at that time. The nightmare left her feeling "depressed" when she woke up (figure 20). It was notable in the session that the nightmare was linked to much rumination about the life event and its consequences. Louise experienced three other recurring nightmares; one that was described to involve the way she looked, a second which involved monsters and fire and a third which involved alarms to warn of a nuclear bomb. These other nightmares were less frequent and less distressing. Louise took sleep medication and reported 12 hours of sleep per night.

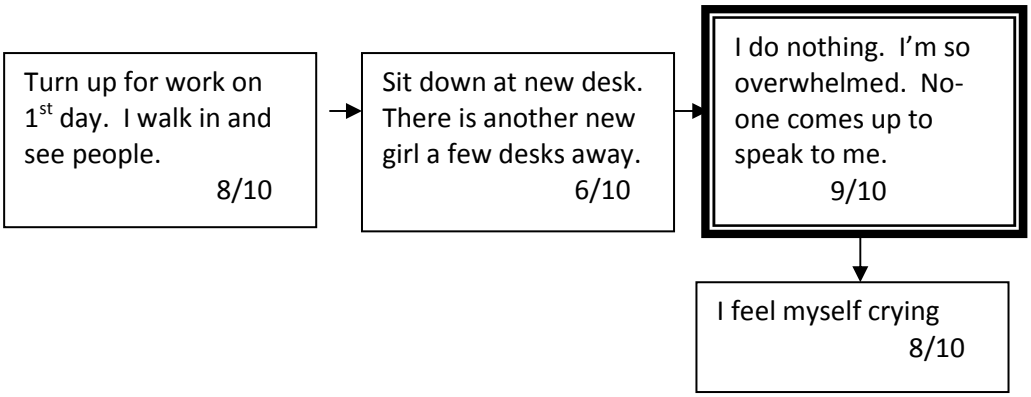

Figure 21. Diagrammatic representation of the scenes in Louise's nightmare. The fractions indicate level of distress; 0=no distress, 10=couldn't feel more distressed. Bold box indicates the point of maximum affect, as described by Louise.

6.5.3 IR

Louise found it difficult to consider an alternative ending that was related to the original nightmare. Discussion of the nightmare led to many ruminative questions such as "why didn't I do something?" and "if only they had given me a separate office, I would have been alright". The helpfulness of these thoughts was considered prior to the imagery work in order to facilitate creation of the script. The script was created in two phases following feedback from Louise (see figure 21).

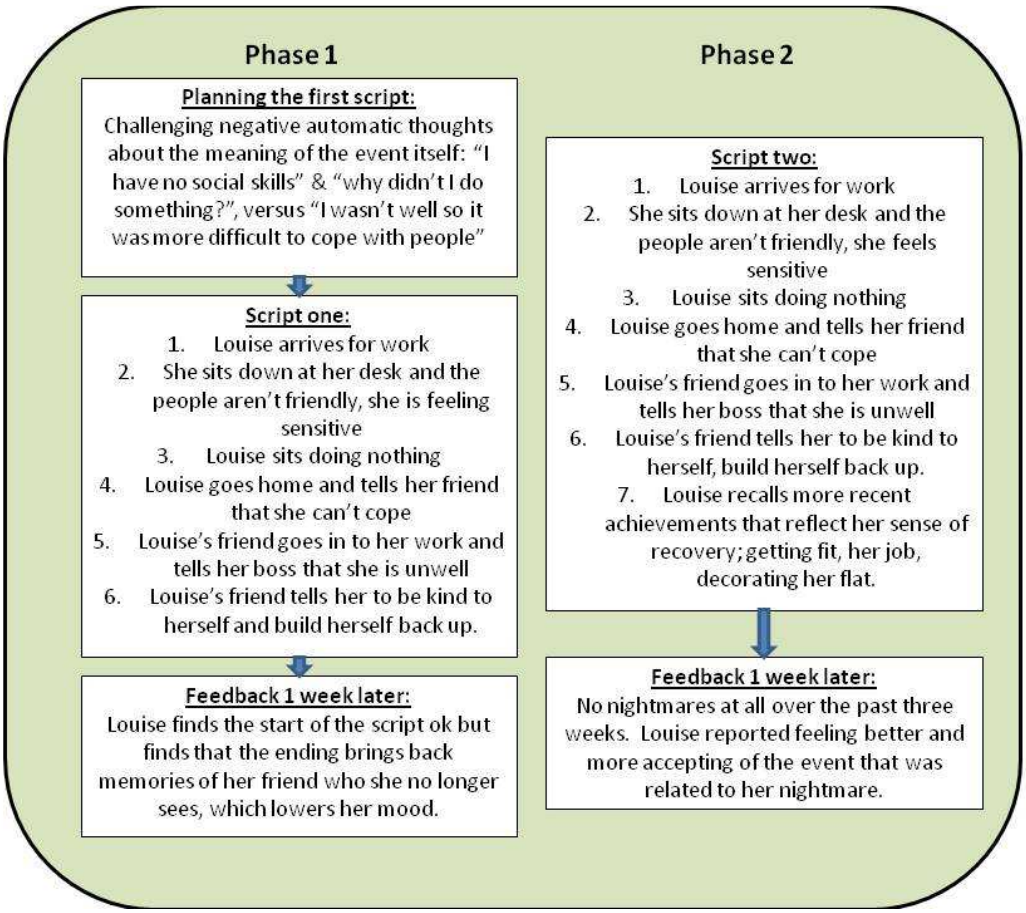

Figure 22. Louise's progress through the intervention, including feedback.

6.5.4 End of session feedback

Louise had experienced no nightmares for three weeks. This was unusual for her; she reported previously experiencing nightmares at least once per fortnight. Louise reported 8/10 fear of her nightmares, pre-IR this was 5/10. Louise attributed the increase to the fact that she was thinking about them more and was unsure how the intervention might impact on them. Louise reported that the event that was related to the nightmare had been "locked in for years", the session helped her to feel more accepting about the event through the day. Louise was 9/10 satisfied with the sessions and could suggest no improvements to sessions.

6.5.5 Two week follow up telephone call

Louise reported experiencing one nightmare since completing the intervention two weeks previously. The content of which had changed; Louise saw herself going to work and doing a lot of work. She reported waking up feeling good rather than feeling anxious. She reported that she felt 7.5/10 fearful of her nightmares.

6.6 Participant 6; "Nicola" (4 sessions, 3 of which were intervention sessions)

6.6.1 Presentation at Baseline

Nicola was a white British female in her forties. Her symptoms of psychosis started approximately twenty years prior to assessment. Nicola held the belief that people in the street had bad thoughts about her and reported hearing two voices that she found extremely distressing. Her voices made accusations against her, e.g. "you're a child abuser". Nicola had previously completed CBTp and was in private therapy. Nicola had experienced significant sexual abuse as a child and also later as an adult. Despite having symptoms of PTSD in relation to childhood sexual abuse, she did not meet diagnostic criteria on the basis that there was no significant impairment in daily functioning (as measured by the PDS). Nicola lived in supported accommodation. At the commencement of sessions Nicola disclosed feeling suicidal, she was therefore re-referred by her local team to a crisis resolution team.

6.6.2 Assessment of Nightmares

Nicola reported experiencing frequent nightmares for approximately ten years. She reported three key nightmares; the first involved being put onto a psychiatric ward. In the second, there was a dead person buried beneath the floorboards and she is interrogated by police. The last nightmare involves Nicola being accused of being a paedophile. This was chosen as her target nightmare on the basis that it was one of her most frequent and most distressing (figure 22). Nicola attributed the cause of the nightmare to one of her previous partners asking her why she was not a child abuser herself, given that she had been abused as a child. Nicola took medication to aid her sleep, reported sleeping for approximately eight hours per night but considered her sleep quality as 'fairly bad'.

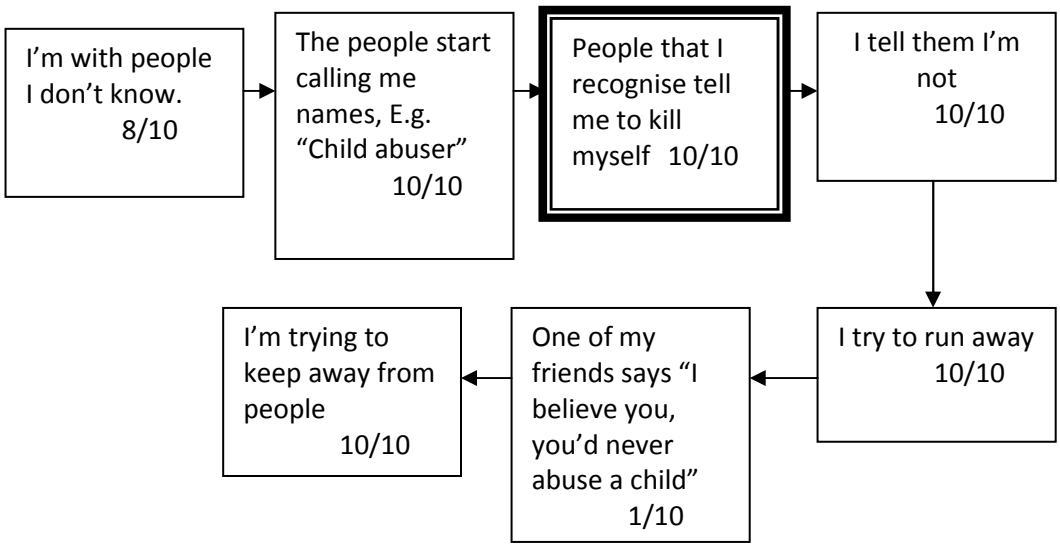

Figure 23. Diagrammatic representation of the scenes in Nicola's target nightmare. Fractions indicate level of distress; 0=no distress, 10=couldn't feel more distressed. Bold box indicates the point of maximum affect, as described by Nicola.

6.6.3 IR

The script was created in two phases, following feedback from Nicola (figure 23).

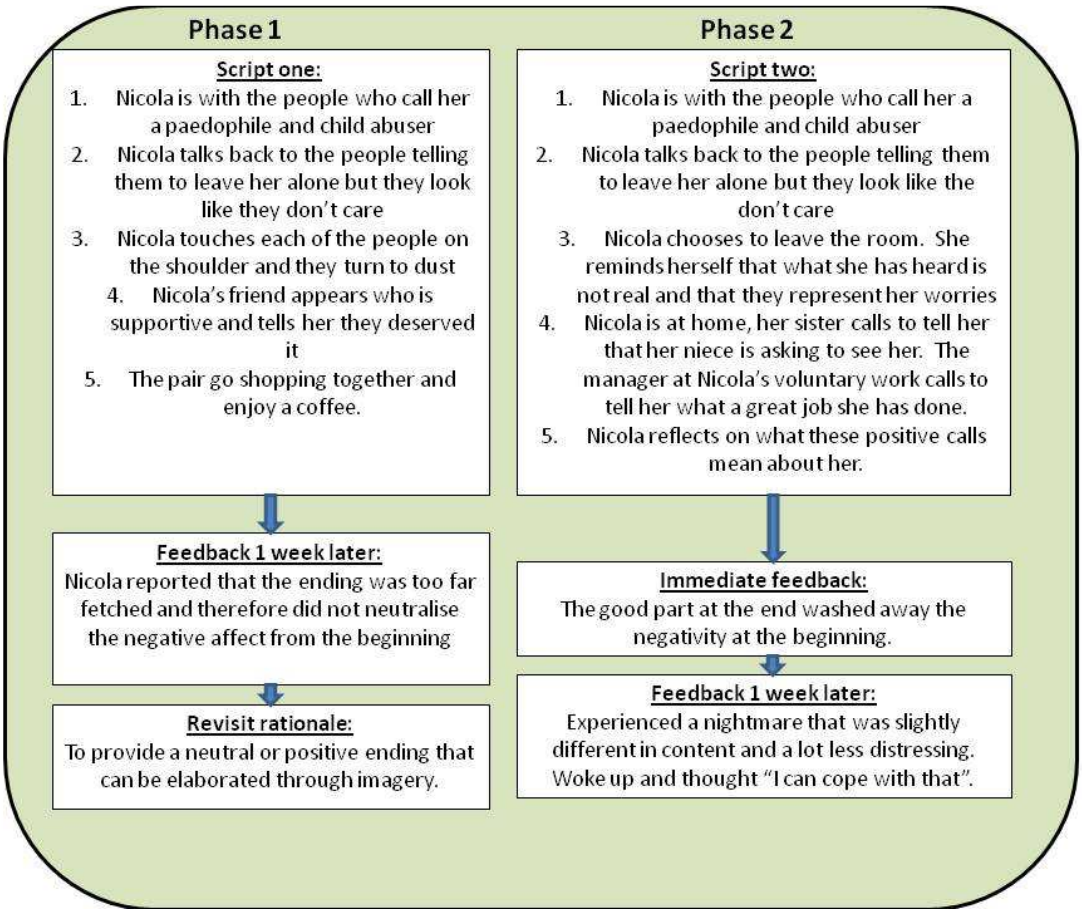

Figure 24. Nicola's progress through the intervention, including feedback.

6.6.4 End of session feedback

Nicola reported one target nightmare between the third and fourth session, which had a marked change in content. Although Nicola was accused of being a child abuser, she was not told to kill herself. Instead she was with another person who was treated in the same way, they supported each other and followed an escape plan. Nicola reported waking up with the thought "I can cope with that". Nicola reported feeling 10/10 satisfied with the intervention.

6.6.5 Two week follow up telephone call

Nicola reported that she had not had any of the target nightmares since the end of the intervention, a fortnight previously. She reported that she felt 3/10 fearful of her nightmares, whereas she had previously felt 7/10 fearful. She reported that she does still have nightmares but that they are about "silly stuff" (E.g. her sister taking a baby on a motorbike). Her distress over the week prior to the phone call was rated 3/10, this was

previously 9/10. Nicola reported that her voices had changed; they still accused her of things (E.g. you're a child abuser") however she reported that the frequency of these comments had lessened, it did not feel so intense when they made comments and she was able to "laugh it off".

6.7 Outcomes

Roland's data is excluded from the outcome analysis on the basis that he dropped out of therapy and did not complete all the necessary follow up measures. Study A was intended to act as a baseline for the IR, however, given that there was a four month delay in the start of recruiting for study B, many (but not all) measures were repeated. The period between study A and pre-IR therefore indicates natural fluctuation in outcomes as well as the effect of being on a waiting list. For standardised measures in which there was test-retest reliability data available, the reliable change index (Jacobsen & Truax, 1991) was calculated.

One of five participants decreased their frequency of nightmares between the beginning of IR and the end of IR. All participants evidenced a decrease in the vividness of their nightmares from prior to IR to the end of IR (see figure xx) and four out of five participants decreased in the distress related to their nightmares and the intensity of their nightmares from the period prior to IR to the end of IR. One participant (Louise) exhibited no change in the distress or intensity of her nightmares (see figure 24).

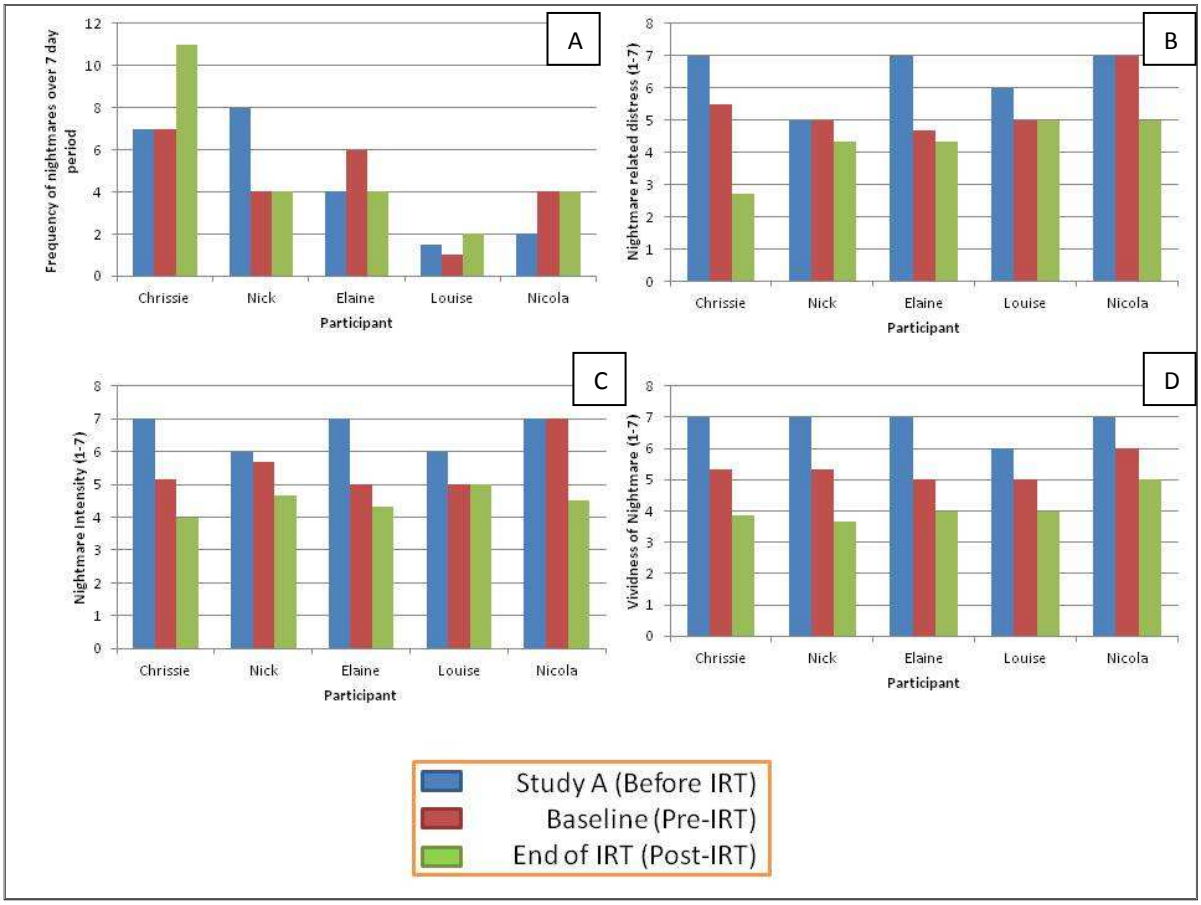

Figure 25. The phenomenology of nightmares as a function of time point in the intervention. (A) frequency of nightmares, (B) nightmare related distress, (C) nightmare intensity and (D) vividness of nightmare.

The PSQI indicates improved sleep quality through a decrease in total score. The PSQI indicated that overall sleep quality improved in four out of five participants (see figure 25). Nick (participant 3) was the only participant to have not improved his overall sleep quality. None of the participants reached below a PSQI score of five, which is an optimal cut-off to distinguish those with sleep difficulties. Despite four (80%) of participants reporting improved sleep quality, none of these participants (0%) achieved a 6 point change in score indicative of a statistically reliable change index (with 95% certainty).

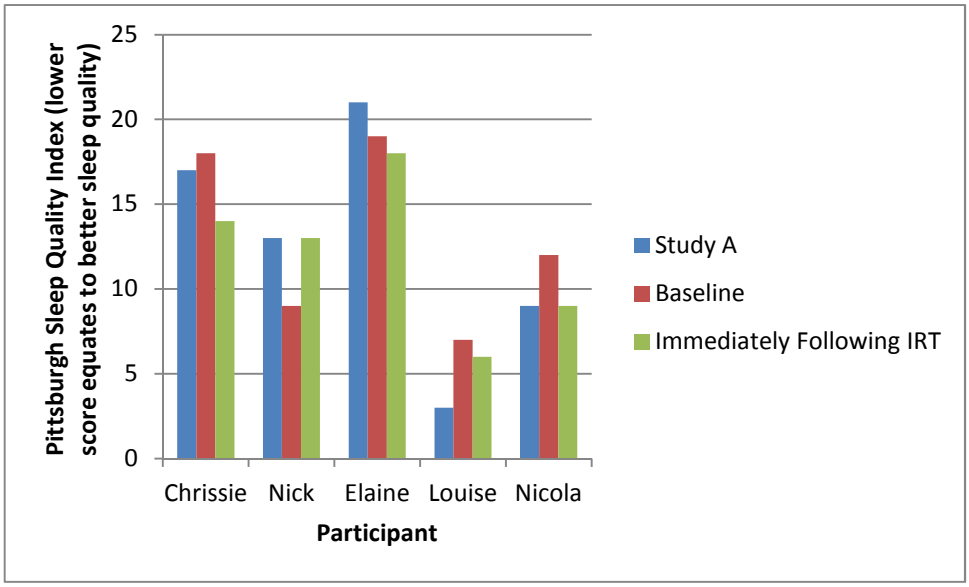

Figure 26. Pittsburgh Sleep Quality Index Score as a function of time point during the intervention

Global distress, as measured by the CORE-10 clinical score decreased from the pre-IR (baseline) to the time point immediately following IR in four out of five cases (see figure 26). Chrissie (participant 2) evidenced an increase in global distress despite a marked decrease in nightmare related distress. Her distress was discussed within session when she disclosed that a friend had passed away that week.

Barkham et al., (2012) report a reliable change index of 6 for the CORE-10 total score (clinical score*10), recommending a 90% false positive rate rather than the traditional 95%. One participant achieved this statistically reliable change (Nicola, participant 6).

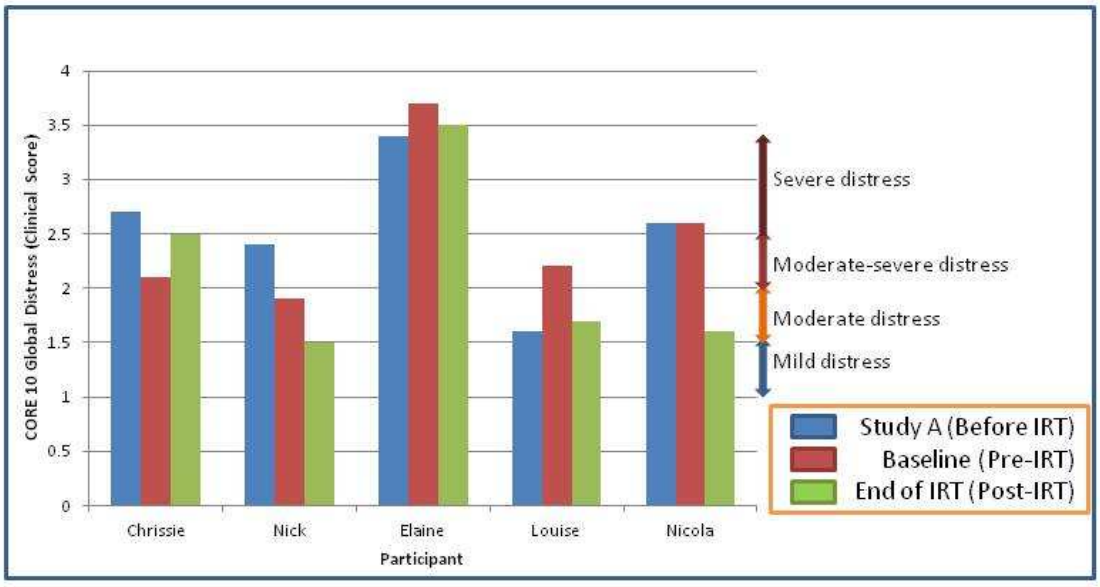

Figure 27. Global distress as a function of time point of intervention.

DASS-21 data were captured in study A and the end of Study B for all participants. For three participants it was additionally captured at the commencement of study B (figure 27). This additional measure was sought due to changes in participant's presentation between study A and study B. Four out of five participants decreased their depression scores between study A and the end of the intervention. Of the three participants who completed a baseline assessment for study B, two decreased in depression (Elaine, participant 3 and Nicola, participant 6) and one participant stayed constant (Louise, participant 5).

With regard to anxiety, two out of five participants decreased their anxiety score between study A and the end of the intervention, two participants remained constant and one participant had higher levels of anxiety. Of those who also completed a baseline assessment, 3/3 decreased their anxiety (Elaine, participant 3, Louise, participant 5 & Nicola, participant 6).

With regards to stress, three of five participants decreased their stress, whilst two increased in stress. Of the three participants with a baseline assessment, one participant evidenced no change (Louise, participant 5), one decreased in anxiety (Nicola, participant 6) and one participant increased (Elaine, participant 3). There is no published test-retest reliability score from which to calculate the Reliable Change Index.

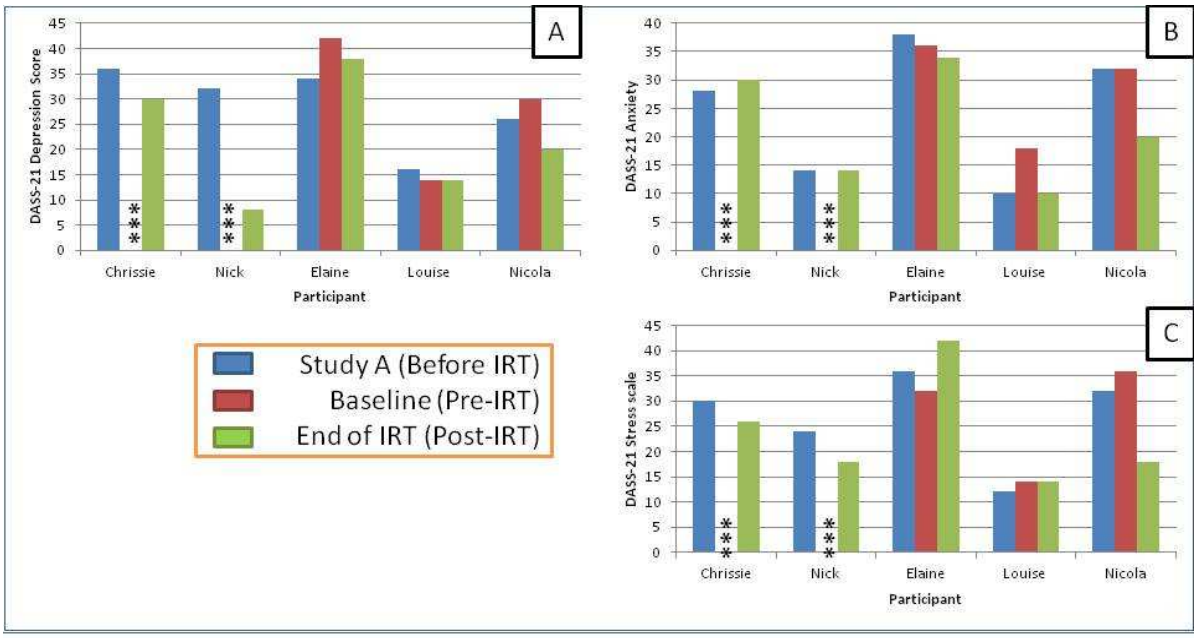

Figure 28. DASS-21 measures as a function of time point across the intervention. (A) indicates DASS-21 Depression scores, (B) indicates DASS-21 Anxiety scores and (C) indicates DASS-21 Stress scores. Missing bars marked with * indicate missing data.**

Four out of five participants evidenced a decrease in PSYRATS for delusions scores between the pre-IR assessment and end of IR (figure 28), whilst one increased (Nicola, participant 6). Two participants (40%; Chrissie, participant 1 and Elaine, participant 3) showed statistically reliable improvement in delusional severity (with 95% confidence) as evidenced by the reliable change index.

The PSYRATS for hallucinations scores indicated a decrease in score from the pre-IR score to the end of IR score in four out of five cases (figure 28). Two of five participants (40%; Chrissie, participant 1 and Elaine, participant 3) evidenced a statistically reliable improvement in PSYRATS for hallucination score, as evidenced by the reliable change index (95% confidence). Nick (participant 2) was the only participant to have evidenced an increase in the severity of his voices. This was also a statistically reliable change as calculated by the reliable change index.

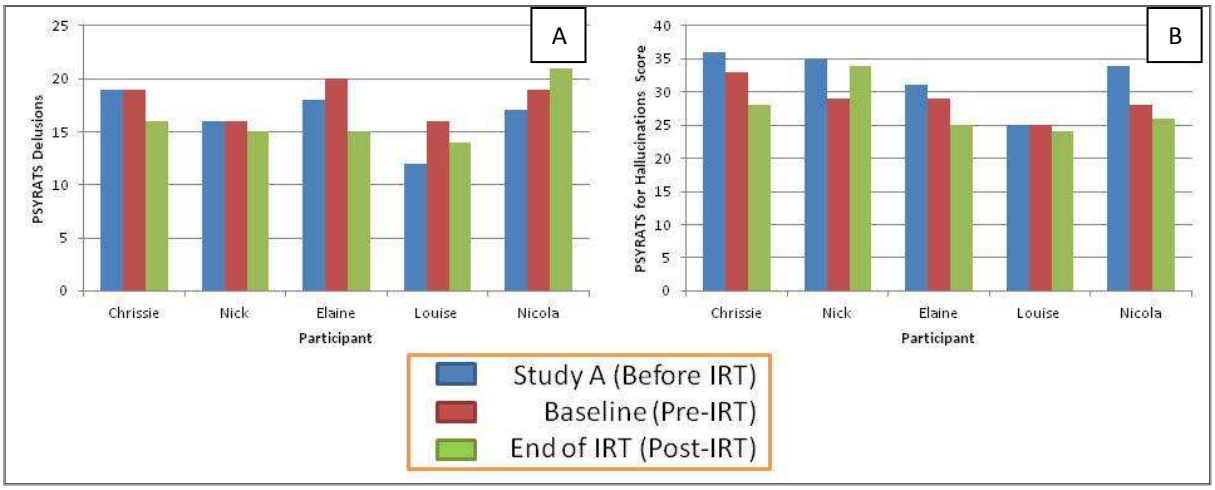

Figure 29. PSYRATS scores as a function of time period in the intervention. Part (A) indicated PSYRATS for delusions scores, part B indicates PSYRATS for hallucinations scores.

The perceived power of voices was marked pre-IR (baseline of study B) and immediately following IR (figure 29). Three out of the five participants evidenced an improved power relationship. Nicola (participant 6) evidenced a deterioration and Nick (participant 2) exhibited no change with regards to power relationship with voice(s). Two of the five participants (20%) had statistically reliable change, Chrissie (participant 1) indicated an improvement in the perceived power of her voice and Nicola (participant 6) reported a deterioration in the perceived power of her voices (with 95% confidence), as calculated by the reliable change index.

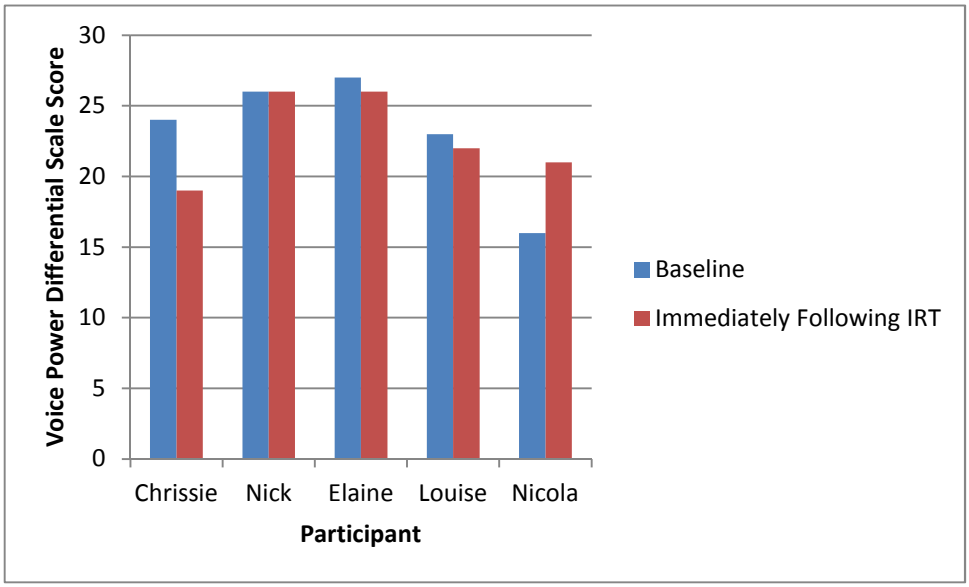

Figure 30. Voice Power Differential Score as a function of time point across the intervention baseline (pre IR) and immediately following IR.

Two participants completed the Persecutor Power Differential Scale pre-IR (baseline of study B) and at the end of IR (figure 30). Both participants evidenced a slight decrease from pre to post-intervention. There is no reported test-retest reliability data and as such the reliable change index cannot be calculated.

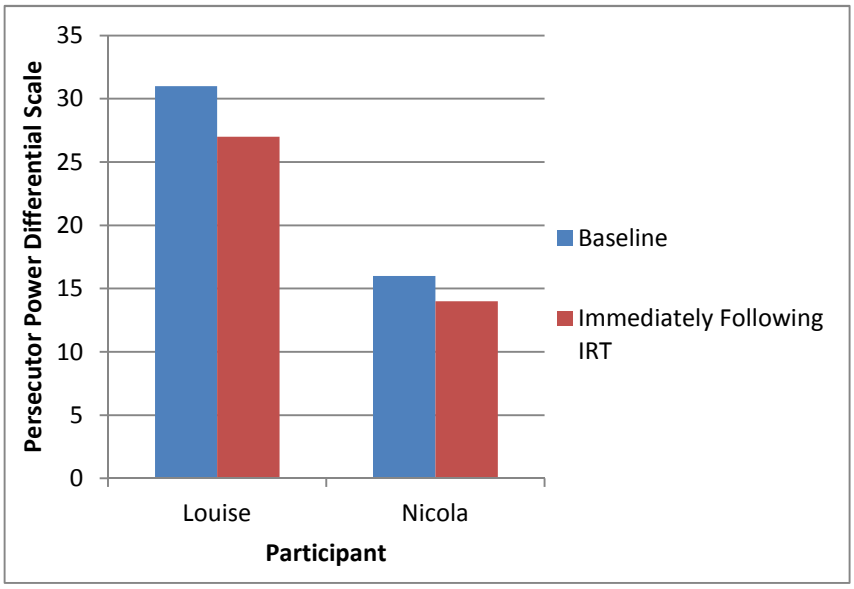

Figure 31. Persecutor Power Differential Scale as a function of time point across therapy; baseline (pre-IR) and immediately following IR.

The following two measures were administered during study A and at the end of study B (there was no pre-IR measure). Given the gap between study A and B the results should be interpreted with caution.

Three participants met criteria for PTSD (Chrissie, participant 1; Nick, Participant 2 and Elaine; Participant 3), as assessed during study A (figure 31). Their PTSD symptom severity was repeated at the end of study B. Whilst two of these participants' PTSD symptom severity score grew slightly worse (Chrissie, participant 1 and Nick, participant 2) by the end of IR, one participant's (Elaine, participant 3) score decreased by a marginal amount. She still met criteria for PTSD at the end of IR. Chrissie's (participant 1) deterioration in PTSD symptom severity met criteria for a statistically significant reliable change index. It should be noted that no pre-IR PTSD measure was collected and there was on average a four month wait between study A and commencement of study B.

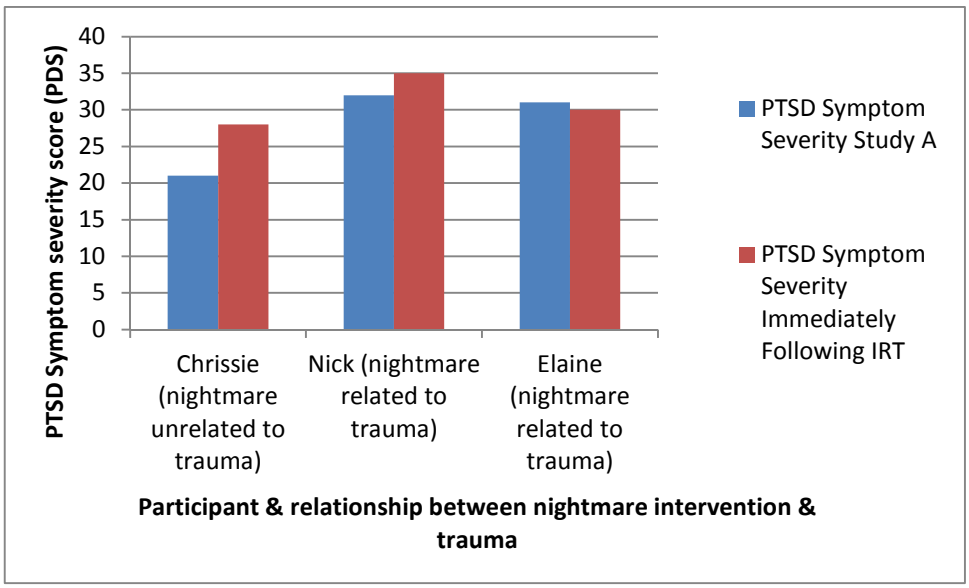

Figure 32. PTSD symptom severity across study A and the end of IR in three participants who met criteria for PTSD during study A.

The Time Budget questionnaire was administered during study A and at the end of the intervention. Three out of five participants evidenced improved activity levels at the end of IR, when compared with their activity levels during study A (see figure 32). None of these increases in activity levels met criteria for statistically reliable change according to the reliable change index. Louise (participant 5) was the only participant to show a slight decrease.

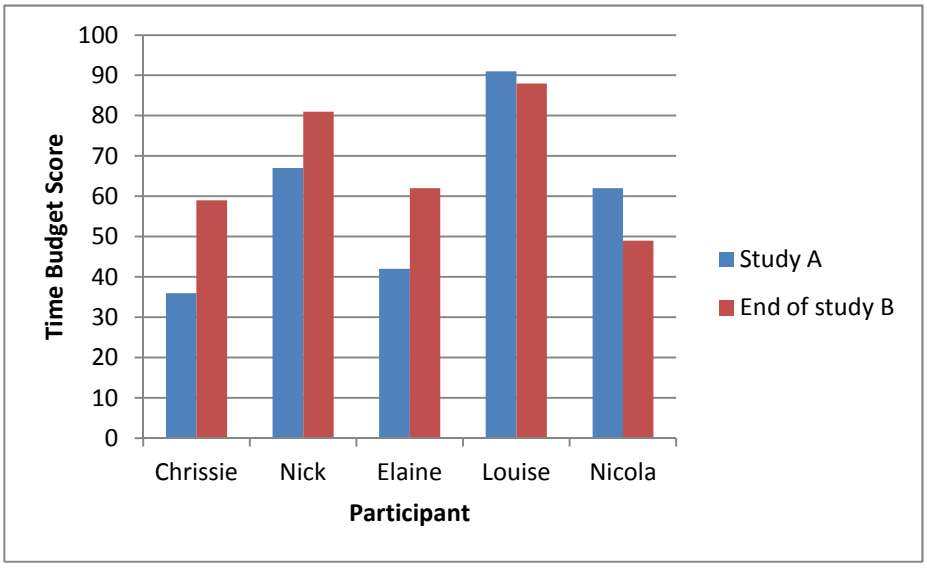

Figure 33. Time budget as a function of time point across the intervention

7. Discussion study B: Case series

The aim of study B was to assess whether IR might be suitably used as an intervention for nightmares for those with psychosis. Specifically, the study aimed to assess the impact of IR on nightmares (frequency, distress, vividness and intensity), sleep quality, psychotic and affective symptomatology. Furthermore the acceptability of the intervention was assessed via ratings of satisfaction and end of session feedback.

This chapter will present a summary of the results and compare those results with existing literature. The clinical implications of the findings will be considered and the strengths and limitations of the study.

7.1 Summary of the results

This exploratory case series was the first to investigate the use of IR as an intervention for nightmares in the context of psychosis. The main finding is that IR is an acceptable treatment option for people with psychosis who present with recurrent and distressing nightmares. It was possible to implement the intervention in a research setting, with a group of participants who presented with auditory hallucinations and / or delusions outside of an established therapeutic relationship. Five out of six participants completed the full intervention and assessment measures.

Exploratory hypothesis one stated that: Following IR there will be a reduction in a range of nightmare related domains; frequency, nightmare related distress, vividness of nightmares and intensity of nightmares. This hypothesis was partially supported. There was no consistent pattern of change in the frequency of the nightmares experienced. However, this null result may be a result of a lack of sensitivity of the measure (which shall be discussed later). Four out of five participants reported a reduction in nightmare related distress following the intervention, one participant reported no change. Four out of five participants reported reduced intensity of their nightmares, one participant reported no change and all participants reported a reduction in the vividness of their nightmares. This quantitative result is substantiated by Nick's (participant 2) post-intervention feedback that his target nightmare had become more disjointed and was less of a "linear" story.

In the qualitative feedback all five participants reported some content change in their nightmare, this ranged from small changes such as Elaine (participant 3) reporting seeing more 'colour' in both what she saw and how she felt in the dream, to larger changes, for example Nicola (participant 5) reported a dream in which she went to work and was able to work (when she had previously been distressed by being unable to complete her work). In line with the reductions in quantitative measures of distress, all participants reported changes in their reaction to the nightmare upon awakening. Elaine (participant 3) reported that she woke feeling less "terror" and that it no longer "ruined" her day, whilst Nicola reported waking to the thought "I can cope with that". Not all the changes were positive; Nick's response had changed from feeling very distressed upon awakening to waking feeling angry. Unfortunately he was unable to complete further sessions to consider further changes to the rescript.

Exploratory hypothesis two stated that: following IR participants will have improved sleep quality. PSQI scores decreased in four out of five participants, in line with an improvement in overall sleep quality. However, none of these participants met criteria for the reliable change index, suggesting that it is possible that these results occurred due to chance. This hypothesis requires replication in a larger sample powered to detect changes in a sample with much variability in sleep quality.

Exploratory hypothesis three stated that: following IR there will be a reduction in measures of psychotic and affective symptomatology. Four out of five participants decreased in the severity of their delusions. Two of these participants evidenced a statistically significant reliable change index score. Two out of two participants noted an improved power differential between themselves and their persecutor. Four out of five participants decreased in measures of the severity of auditory hallucinations; two of these participants' change met criteria for the reliable change index. The last participant evidenced a statistically significant deterioration in the severity of their auditory hallucinations. There was no clear pattern of change in the voice power differential. Two participants found it challenging to engage in the intervention due to symptoms of psychosis. The impact of these symptoms will be discussed later.

Four out of five participants decreased in their depression scores from pre-therapy measures to post-therapy measures. Three of five participants decreased their anxiety and their stress scores from pre-therapy to post-therapy. It was not possible to calculate whether these reported changes were statistically significant reliable changes. Four out of five participants reduced their global distress score. One of these participants achieved a statistically significant reliable change. There was no clear pattern of change with regard to PTSD symptom severity from pre to post therapy. In addition to markers of symptomatic change, participants completed questionnaires to indicate their level of daytime activity. There was no clear pattern of improvement or deterioration.

Exploratory hypothesis four stated that: IR will be deemed an acceptable treatment for nightmares in patients with psychosis, as indicated by end of session feedback and satisfaction ratings for the intervention. This hypothesis is supported; the mean rating for the level of satisfaction participants felt with the intervention was 9.2/10. When asked to suggest improvements to the intervention participants recommended using the same research room for each appointment, adding availability of a coffee machine in the waiting area and adding relaxing sounds to the recording of the re-script. The lowest satisfaction rating (7/10) was from Nick (participant 2) who acknowledged the challenges of his voice during the intervention but did not consider there was anything that the researcher could have done to improve this.

7.2 Implementing IR in the context of psychosis

Chapter one (review of the literature) outlined several factors that might impact on the delivery of CBT based interventions for those with psychosis. Managing risk issues was one such factor that was particularly relevant to the delivery of the intervention. Of the six participants who entered the intervention, care teams were contacted for four participants in order to assess and manage risk that arose during the course of the intervention, but unrelated to the intervention. Two participants disclosed voices commanding them to hurt others (including the therapist) and two participants disclosed significant risk of suicide. This finding is consistent with reports of elevated risks of violence (Mullen, 2006) in those with psychosis and increased risk of suicide in those with psychosis (Palmer et al., 2005) and those with nightmares (Pigeon et al., 2012). This is an important consideration

when implementing a protocol originally developed in non psychosis diagnostic groups where risk might be lower.

It is worth considering the role of auditory hallucinations in both the nightmares themselves as well as the ability to engage in imagery. Nick (participant 2) saw a depiction of his voice in his original nightmare, and within his re-script he provided his voice with the comfort that he himself could have benefitted from (by choosing to hug her). In addition, his ability to engage in the imagery element of the intervention was challenged by his voice telling him to harm the therapist. He described that the volume of his voice increased in order to compete with the therapists' own voice. Elaine (participant 3) reported that her voice took on a protective role in the original nightmare, waking her up from her nightmare at the point of maximum affect. Given that arousal and stress have been associated with an increase in auditory hallucinations during the day (Slade, 1972) it seems reasonable to consider that distressing nightmares might also include the presence of auditory hallucinations.

Symptoms of delusions also impacted on therapeutic progress. Much of the distress that Roland (participant 4) experienced in relation to his nightmares was due to meta-cognitive beliefs. Whilst lack of control was a distressing theme in Roland's nightmares, his distress additionally arose from his belief that spirits were inserting his nightmares into his head. This resulted in him being ambivalent about the intervention; he believed reading the script meant engaging with the spirits. This highlights the importance of a thorough assessment of the appropriateness of IR for nightmare content versus CBTp for delusions, prior to undertaking the work. For another participant their ongoing delusional belief was apparent in devising the rescript. Nick (participant 2) considered using his belief in psycho-kinesis as a means to create an alternative ending to his nightmare. It was challenging to suggest viable alternatives that were as acceptable to him, but which did not reinforce his belief. For this participant, it was important to spend more time planning the script prior to undertaking the imagery work. This is in line with Fowler et al.'s, (1995) treatment manual that suggests an approach that is both flexible and considers the role of symptoms of psychosis within the session.

7.3 Comparison to previous research

The current study adds to the small body of literature suggesting that imagery techniques may be a helpful therapeutic tool for those with psychosis (Schulze, 2009; Serruya & Grant 2009; Ison, 2011; Morrison, 2004). It is difficult to draw clear conclusions regarding the effectiveness of the intervention given the small sample and the lack of control group. However, results indicate change on a range of nightmare related measures including nightmare distress, intensity and vividness. Furthermore, two participants evidenced improvements on measures of auditory hallucinations and delusions. Whilst these require replication in a larger sample, the results are encouraging. Adverse effects were not apparent as a direct result of the use of IR although the psychosis symptoms of some participants needed to be considered carefully and some adaptations made, to ensure an individual and flexible approach, as in interventions with psychosis in general (Fowler et al 1995).

The IR protocol was originally developed for those with PTSD related nightmares. It is therefore helpful to consider potential similarities and differences in outcomes as well as the adaptations that might be required for those with psychosis. A recent meta-analysis indicated that IR was effective in reducing PTSD related nightmare frequency and daytime PTSD symptoms whilst also improving sleep quality in those with PTSD related nightmares (Casement & Swanson, 2012). The current investigation did not find a clear change in nightmare frequency. Furthermore, despite improvements in sleep quality for the majority of participants (4/5), it was not possible to conclude that these were not a reflection of variability in measurement error and normal fluctuations. Instead, there were positive improvements in nightmare related distress as well as nightmare intensity and vividness as well as severity of delusions and hallucinations. The following section will consider the importance of nightmare distress as a more appropriate outcome measure.

A primary outcome for IR within PTSD literature is nightmare frequency. This is despite the evidence suggesting that nightmare distress is a better indicator of daytime psychopathology (Nielson & Levin, 2007; Semiz et al., 2008; Levin & Fireman, 2002). This finding from the nightmare literature has parallels with findings from those with positive symptoms of psychosis. A review by Kuipers et al., (2006) reports that hallucinations and delusions occur within the general population in addition to clinical samples and that

distress distinguishes between those that require clinical services and those that do not. It is therefore suggested that a reduction in nightmare related distress, as was found within the current study, is an important outcome and one to be taken forward to future studies.

It might also be considered that the current sample were a more complex sample to treat than the majority of studies which have used PTSD civilian samples. All participants reported 3-4 key recurrent nightmares rather than a single target for intervention. Results from study A indicated that in those with psychosis, higher nightmare distress was related to increased severity of delusions, depression, anxiety and stress. Furthermore, the majority of study B participants presented with risk to self or others which warranted session time for assessment and management. These factors presented in addition to the fact that three out of five participants met criteria for PTSD, as measured on the PDS. More intensive IR packages have recently been developed in order to increase the effect of interventions. Long et al. (2011) added an exposure element and increased the number of sessions in order to increase the opportunity for script rehearsal. Ulmer et al. (2011) and Swanson et al. (2009) have taken the alternative route of adding CBT for insomnia to an IR protocol in order to create a comprehensive package intervention that considers pre-sleep factors in addition to imagery. Given Myers et al. (2011) showed promising reductions in insomnia and persecutory delusions through their pilot of CBTi for psychosis, these additions might complement the current IR intervention.

7.4 Clinical implications

The key clinical implication is that it is feasible to adapt IR for those with symptoms of psychosis. The results described above are encouraging but warrant a larger study in order to draw strong conclusions regarding the impact that such an IR protocol might have on these outcomes in a psychosis population.

It is recommended that that the IR protocol be imbedded within a comprehensive CBTp protocol. This would help the IR protocol be more inclusive to those with symptoms that impact on the intervention. For Roland (participant 4) for example, the primary source of his distress arose from his daytime beliefs, rather than recurrent nightmare content. In this case a standard CBTp treatment manual would be more appropriate prior to considering IR. It would also have been helpful to have a more comprehensive assessment of Nick's voices

with regard to triggers, how they might respond during the imagery and consider the possibility of a graded approach to working with the nightmare. Given the short length of the IR protocol, it would be feasible to imbed the intervention into current NICE (2009) recommended CBTp.

The practical implementation of the IR protocol relied on careful time planning. In order to allow participants to practice the script in between sessions the researcher typed out the script and recorded it onto CD immediately following the session. This was sent in the post as soon as possible. Ideally, the participants would have spent a week reading or listening to the script, however, with postal delays some participants reported not receiving the package until half way through the week. It might be more appropriate to have sessions every 10 days (rather than weekly) in order to allow for potential delays, utilise emails or record scripts within session in order to facilitate timely rehearsal.

Supportive and well organised supervision was of much benefit to the research. In particular, discussion of risk issues, of the impact of hearing distressing traumatic memories on the researcher and discussion of adaptations for the psychosis population. Given the timing difficulties mentioned above, it was important that supervision was planned on the same day, but after the session, in order to allow the script to be sent to the participant.

7.5 Strengths and limitations

A strength and limitation of the case series is the heterogeneity of the sample in respect of presence of delusions, hallucinations, PTSD symptomatology and previous experience of therapy. This is a strength with regard to the versatility of the IR protocol however, future research might utilise a more homogenous sample in order to draw clear conclusions regarding correlates and mechanisms of change. Future considerations to strengthen conclusions regarding IR for nightmares in the context of psychosis would include: a treatment as usual and active control group, blinded assessments and a larger sample.

Despite participants reporting a decrease in the target nightmare at the two week follow up phone call this was not translated into decreases in frequency on the nightmare log. Nicola reported that at the two week follow up telephone call she had not experienced any target nightmares, Nick reported less “big” nightmares, Elaine reported a decrease in

frequency and Louise reported only one nightmare since the intervention at the two week phone call. One plausible explanation for the lack of calibration between quantitative and qualitative measures in that the nightmare logs were designed to capture all nightmares, including those that were not the focus of the intervention. It is possible that whilst the target nightmare might have reduced in frequency, non-target nightmares may have increased. Indeed, Nick reported that whilst he was "not having as many bad ones", he was having "little random ones". A further study might consider increasing the nightmares log's sensitivity to change by measuring the frequency of target and non-target nightmares separately.

Given the link between nightmare distress and affective symptomatology reported in study A, the importance of gaining a sensitive measure using the DASS-21 is highlighted. However, due to a delay in carrying out the case series element of the research there was a four months gap in assessment of the DASS-21 measure in two cases. This gap also impacted on measures of daytime activity levels and PTSD symptomatology. The delay was the result of local R&D approval procedures; evidence of nightmares in those with psychosis was required from study A, prior to approval being granted for study B.

7.6 Conclusions

IR has a strong evidence base as a nightmare specific intervention for those with PTSD (Casement & Swanson, 2012). This preliminary investigation suggests that IR is a protocol that can be suitably adapted as an intervention for people with nightmares in the context of hallucinations and delusions as well as co-morbid symptoms of PTSD. Initial findings suggest that IR might impact on nightmare related distress, intensity and vividness of nightmares, affective and psychotic symptomatology. However, there are many limitations to this initial study and a larger controlled trial, with blinded assessments is warranted.

8. Suggestions for future research and conclusions

8.1 Summary

This is the first systematic investigation of the phenomenology of nightmares in the context of psychosis and the first to investigate the appropriateness of a nightmare specific intervention (IR) in this population. The study has revealed that nightmares are a common problem for those with psychosis. Higher frequency of nightmares was related to worse sleep quality and nightmare related distress was related to psychotic, affective and cognitive symptoms (delusional severity, depression, anxiety, stress and working memory). This study particularly highlights the importance of measuring nightmare related distress over and above the frequency of such an experience. It was nightmare related distress that related to daytime psychiatric measures, independently of nightmare frequency.

Study B showed that rescripting of nightmares is a treatment approach that can be suitably adapted from a PTSD sample to those with psychosis. Although further research with larger sample sizes is required, this case series indicated that IR might have a positive impact on measure of nightmare distress, vividness and intensity of nightmares, psychosis symptoms and affective measures. IR did not show adverse effects as an intervention for those with psychosis.

This study highlights the importance of taking a symptom focused, rather than diagnosis focused approach. The problem of nightmares has been shown to be prevalent outside of those with PTSD, and has been related to a specific symptom of psychosis: delusional beliefs.

8.2 Suggestions for further research

Although the current study indicated that nightmares were related to delusional severity, the direction of causality is unclear. Fear extinction and emotion regulation models of dreaming (Nielson & Levin, 2007; Desseilles et al., 2010; Gujar et al., 2011; Nishida et al., 2009) would predict that nightmares result from disrupted processing of distressing daytime experiences. However, an alternative model might suggest that delusional ideas are formed following sleep disturbance (Freeman et al., 2002), which might be caused by nightmares. It is of course possible that both of the above are true and that the relationship is bi-directional, as has been suggested in the PTSD literature (Van Liempt,

2012). A further account might place an underlying process as key in producing both distressing nightmares and distressing daytime symptomatology. The following section will propose several areas of research to clarify these different positions.

8.2.1 Nightmares as a disruption of emotional processing

Nielson and Levin (2007) theorise that nightmares result from an interaction between what they term affect load and affect distress. They postulate that fear extinction is the primary role of dreaming but nightmares represent a disruption in this process. This may be due to increased daytime demands on the emotional memory system (increased affect load) and /or an increased trait disposition to experience heightened emotional distress in response to emotional stimuli (affect distress). It is possible that those with delusions have increased demands on their night time emotion regulation system due to distressing experiences (e.g. feeling scared in relation to a belief that someone is plotting to harm them). This is consistent with the finding that high levels of anxiety and depression are found in those with persecutory delusions (Freeman et al., 2012b). Experience sampling methodology might help uncover whether nightmares fluctuate in response to fluctuations in distressing daytime experiences and is an avenue for further research.

8.2.2 Nightmares result in distressing symptoms

In their model of the formation of persecutory delusions, Freeman et al., (2002) propose a key role for anxiety and insomnia. The current study has shown that both of these are related to nightmares. Freeman et al. (2002) describes that anxiety heightens the anticipation of danger, whilst sleep disturbance is hypothesised to increase arousal following a precipitant event. These processes, in addition to worry and pre-existing schemas and cognitive biases result in the formation of a 'threat belief' (Freeman et al., 2002). The current study has identified that nightmares are associated with sleep disturbance, anxiety and most importantly delusional severity. It is possible that nightmares serve as a risk factor for the development of new inceptions and the maintenance of paranoid thinking, as has been found for insomnia (Freeman et al., 2012a). It would not be a novel finding that nightmares predict psychopathology; Van Liempt (2012) reports that pre-deployment nightmares predicted 6-month post deployment PTSD symptoms in military personnel. Longitudinal research could pinpoint whether nightmares

pre-exist the development of delusional ideas, are a correlate of first episode psychosis or follow later in the course of the illness.

8.2.3 The role of cognitions in nightmares and delusions

Given that CBTp is a recommended treatment for psychosis in the UK (NICE, 2009) and USA (National Institute of Mental Health, 2013), it is helpful to consider the potential overlap between cognitions in nightmares and psychosis. Spoormaker (2008) has proposed a cognitive model of nightmares. He asserts that a nightmare script is a fixed expectation pattern and if dream elements are appraised to be similar in either content or emotional tone to the original nightmare, the script will likely become activated. He therefore proposes a role for interpretation biases in appraising dream content. In addition, Spoormaker (2008) suggests that pre-sleep cognitive avoidance drives safety behaviours such as thought blocking, avoiding going to bed or sleeping with the light on. Post-sleep meta-cognitive appraisals such as "I must be going crazy" also serve to heighten the anxiety attached to the nightmare script. Given the high prevalence of both nightmares and insomnia in those with psychosis, it would be helpful to consider the role of cognitions prior to, during and following nightmares.

The following section will put forward a case for further research into a cognitive vulnerability that spans across both distressing nightmares and distressing symptoms of psychosis. Overlap in cognitive risk factors has recently been found in paranoia and another diagnosis which suffers frequent nightmares: PTSD (Freeman et al., 2013). This is despite the fact that PTSD and paranoia are two distinct experiences (Freeman et al., 2013). Results from those with psychosis (from the current study) and from a sample of healthy students (Levin and Fireman, 2002) both place nightmare related distress as key in predicting psychopathology. Cognitions have been implicated in both nightmare related distress (Spoormaker, 2008) and delusional/paranoid thinking (Freeman et al., 2012b; Freeman & Garety, 1999). More specifically, a self-focused cognitive style and negative ideas about the self have been found in paranoid thinking (Freeman et al., 2012b) and meta-cognitive beliefs contribute to delusional distress (Freeman & Garety, 1999). It would be interesting to see if these cognitive styles are also implicated in nightmare related distress in those with psychosis. Such underlying cognitive processing and distortions across both delusions and nightmares would have exciting clinical implications for CBTp

(Chadwick, Birchwood & Trower, 1996; Fowler, Garety & Kuipers, 1995; Laroi & Aleman, 2010).

8.2.4 Cognitive deficits and their link with sleep disruption and nightmares

The finding that a higher level of nightmare distress was associated with lower performance on a working memory task is novel. Whilst there is a wealth of research confirming the link between slow wave sleep and cognitive symptoms of psychosis (Keshavan et al., 2011; Wamesley et al., 2012; Phillips et al., 2012; Manoach et al., 2010), this is the first study linking nightmares (a phenomenon primarily found in REM sleep; Bosch & van den Noort, 2008) and a cognitive deficit: working memory. Given that cognitive symptoms are an important attribute of clinical presentation, the best predictor of functional status in psychosis (Bowie & Harvey, 2006) and predate the onset of positive symptoms (Kayman & Goldstein, 2012), this finding clearly warrants further investigation. Future research might study the developmental course of nightmares, cognitive symptoms and positive symptoms, or observe the impact of nightmare interventions (such as IR) on working memory. Lastly, the link between nightmares and other cognitive deficits found in schizophrenia might be investigated (E.g. speed of processing, attention, verbal and visual learning and memory, reasoning and problem solving; Neuchterlein et al., 2004).

8.2.5 Nightmares and auditory hallucinations

The current study revealed a non-significant medium positive correlation (.33) between nightmare related distress and the severity of auditory hallucinations. This finding fell just short of significance (p=.08). The current study was powered to detect correlations of at least .43, with a sample of 37. The correlation between nightmare distress and auditory hallucinations is therefore underpowered both due to the size of the sample (28) and size of the correlation found (.33). Further research, with a sample powered to detect this result is clearly required.

8.2.6 IR as an intervention for nightmares in the context of psychosis

The next stage for research of IR in the context of psychosis would be a larger pilot study in preparation for a larger randomised controlled trial. Given the large significant association between nightmare distress and delusional severity from study A, it would be recommended that such a trial create a homogenous sample, including only those with delusions. Study A and B combined suggested that those with frequent distressing

nightmares present a complex sample to treat due to the severity of delusions, depression, anxiety, stress, insomnia, risk of harm to self and others in addition to the reported 3-4 different recurrent nightmares. Lengthening the IR intervention, increasing imagery rehearsal time by having larger gaps between sessions and / or combining with a CBT for insomnia protocol are adaptations that might increase the effect of the intervention. Further improvements might include thorough pre-post intervention measures of affect and improving the sensitivity of the measure to nightmare frequency by measuring frequency of each individual nightmare. The primary outcome expected from such a trial would include improved nightmare related distress, with secondary outcomes including improved delusional severity, depression and anxiety, sleep and a reduction of risk.

8.3 Conclusions

The current investigation has highlighted that nightmares are a prevalent problem for those with psychosis. Nightmares correlate with sleep quality as well as daytime psychotic, affective and cognitive symptoms. IR was trialled as an intervention for nightmares within this context of psychosis. Successes, challenges and future adaptations were considered. This study has opened up several lines of research that require investigation. These include understanding when nightmares appear within the development of psychosis, better understanding the direction of causality and underlying processes linking nightmares with daytime symptoms. Lastly, there is scope for a larger trial of IR as a treatment of nightmares in the context of psychosis.

9. References

Afonso, P., Figueira, M. L., & Paiva, T. (2013). Sleep-wake patterns in schizophrenia patients compared to healthy controls. *The world journal of biological psychiatry: the official journal of the World Federation of Societies of Biological Psychiatry*, (53), 1–8.

Aleman, a, Hijman, R., De Haan, E. H., & Kahn, R. S. (1999). Memory impairment in schizophrenia: a meta-analysis. *The American journal of psychiatry*, *156*(9), 1358–66.

American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.). Washington, DC: American Psychiatric Association.

Ağargün, M. Y., Cilli, a S., Kara, H., Tarhan, N., Kincir, F., & Oz, H. (1998). Repetitive and frightening dreams and suicidal behavior in patients with major depression. *Comprehensive psychiatry*, *39*(4), 198–202.

American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.). Washington, DC: American Psychiatric Association.

Andreasen, N. C., Arndt, S., Alliger, R., Miller, D., & Flaum, M. (1995). Symptoms of schizophrenia. *Archives of General Psychiatry*, *52*, 341–351.

Arntz, A. (2012). Imagery Rescripting as a Therapeutic Technique: Review of Clinical Trials, Basic Studies, and Research Agenda. *Journal of Experimental Psychopathology*, *3*(2), 189–208.

Arntz, A., Tiesema, M., & Kindt, M. (2007). Treatment of PTSD: a comparison of imaginal exposure with and without imagery rescripting. *Journal of behavior therapy and experimental psychiatry*, *38*(4), 345–70.

Arntz, A., & Van Genderen, H. (2009). *Schema therapy for borderline personality disorder*. West Sussex: John Wiley & Sons Ltd.

Atkins, M., Burgess, a., Bottomley, C., & Riccio, M. (1997). Chlorpromazine equivalents: a consensus of opinion for both clinical and research applications. *Psychiatric Bulletin*, *21*(4), 224–226.

Backhaus, J., Junghanns, K., Broocks, A., Riemann, D. & Hohagen, F. (2002). Test-retest reliability and validity of the Pittsburgh Sleep Quality Index in primary insomnia. *Journal of Psychosomatic Research*, 53: 737-740.

Barkham, M., Gilbert, N., Connell, J., Marshall, C., & Twigg, E. (2005). Suitability and utility of the CORE-OM and CORE-A for assessing severity of presenting problems in psychological therapy services based in primary and secondary care settings. *British Journal of Psychiatry, 186*, 239-246.

Barnes, T. R. E., & Paton, C. (2011). Antipsychotic polypharmacy in schizophrenia: benefits and risks. *CNS drugs*, *25*(5), 383–99.

Bebbington,P.E., Angermeyer,M., Azorin,J.M., Brugha,T., Kilian,R., Johnson,S., Toumi,M., Kornfeld,A., & EuroSC Res Group (2005). The European Schizophrenia Cohort (EuroSC) - A naturalistic prognostic and economic study. *Social Psychiatry and Psychiatric Epidemiology, 40*(9), 707-717.

Bebbington, P., Jonas, S., Kuipers, E., King, M. & Cooper, C. et al. (2011). Childhood sexual abuse and psychosis: data from a cross-sectional national psychiatric survey in England. *The British Journal of Psychiatry* 199: 29-37.

Bentall, R. P. (2003). *Madness Explained: Psychosis and Human Nature*. London: Penguin Books Ltd.

Bentall, R. P. (2004). Abandoning the concept of schizophrenia: the cognitive psychology of hallucinations and delusions. *Models of Madness: Psychological Social and Biological Approaches to Schizophrenia* (pp. 195–208). East Sussex: Brunner-Routledge.

Berger, M., & Riemann, D. (1993). REM sleep in depression - an overview. *Journal of sleep research*, *2*, 211–223.

Bernardo, M., Coma, A., Ibáñez, C., Zara, C., Bari, J. M., & Serrano-Blanco, A. (2012). Antipsychotic polypharmacy in a regional health service: a population-based study. *BMC psychiatry*, *12*(1), 42.

Birchwood, M., Meaden, A., Trower, P. & Plaistow, J. (2000). The power and omnipotence of voices: subordination and entrapment by voices and significant others. Psychological Medicine, 30: 337-344.

Blagrove, M., Farmer, L., & Williams, E. (2004). The relationship of nightmare frequency and nightmare distress to well-being. *Journal of sleep research*, *13*(2), 129–36.

Bosch, P., & Van den Noort, M. (2008). *Schizophrenia, Sleep, Acupuncture*. Göttingen, Germany: Hogrefe & Huber.

Bowie, C. R., & Harvey, P. D. (2006). Cognitive deficits and functional outcome in schizophrenia. *Neuropsychiatric disease and treatment*, *2*(4), 531–6.

Boydell, J., Onwumere, J., Dutta, R., Bhavsar, V., Hill, N., Morgan, C., Dazzan, P., et al. (2013). Caregiving in first-episode psychosis: social characteristics associated with perceived “burden” and associations with compulsory treatment. *Early intervention in psychiatry*, (June 2010), 1–8.

Bretag-Norris, R., & Alexander, J. (2012). Atypical antipsychotic medication: a nightmarish problem! *The Australian and New Zealand journal of psychiatry*, *46*(9), 909.

Brewin, C. R., Gregory, J. D., Lipton, M., & Burgess, N. (2010). Intrusive images in psychological disorders: characteristics, neural mechanisms, and treatment implications. *Psychological review*, *117*(1), 210–32.

Bromundt, V., Köster, M., Georgiev-Kill, A., Opwis, K., Wirz-Justice, A., Stoppe, G., & Cajochen, C. (2011). Sleep-wake cycles and cognitive functioning in schizophrenia. *The British journal of psychiatry: the journal of mental science*, *198*(4), 269–76.

Brown, T.A., Chorpita, B.F., Korotitsch, W., & Barlow, D.H. (1997). Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. *Behaviour Research and Therapy*, 35(1): 79-89.

Buysse,D.J., Reynolds,C.F., Monk,T.H., Berman,S.R., & Kupfer,D.J. (1989). The Pittsburgh Sleep Quality Index (PSQI): A new instrument for psychiatric research and practice. *Psychiatry Research*, 28(2): 193-213.

Casement, M. D., & Swanson, L. M. (2012). A meta-analysis of imagery rehearsal for post-trauma nightmares: effects on nightmare frequency, sleep quality, and posttraumatic stress. *Clinical psychology review*, *32*(6), 566–74.

Chadwick, P., Birchwood, M., & Trower, P. (1996). *Cognitive therapy for delusions, voices and paranoia*. West Sussex: John Wiley & Sons Ltd.

Clark, R. E., Bartels, S. J., Mellman, T. a, & Peacock, W. J. (2002). Recent trends in antipsychotic combination therapy of schizophrenia and schizoaffective disorder: implications for state mental health policy. *Schizophrenia bulletin*, *28*(1), 75–84.

Clark, D. M., Ehlers, A., Hackmann, A., McManus, F., Fennell, M., Grey, N., Waddington, L., et al. (2006). Cognitive therapy versus exposure and applied relaxation in social phobia: A randomized controlled trial. *Journal of consulting and clinical psychology*, *74*(3), 568–78.

Coentre, R. & Power, P. (2011). A diagnostic dilemma between psychosis and post-traumatic stress disorder: a case report and review of the literature. *Journal of Medical Case Reports* 5: 97-101.

Connell, J. & Barkham, M. (2007). *CORE-10 User Manual,Version 1.1.* CORE System Trust and CORE Information Management Systems Ltd.

CORE-ims (n.d.). *CORE Measurement tools*. Retrieved 10 January 2013 from: http://www.coreims.co.uk/About_Measurement_CORE_Tools.html

Cowen, P., Harrison, P., & Burns, T. (2012). *Shorter Oxford Textbook of Psychiatry*. Oxford: Oxford University Press.

Davis, J. L., Rhudy, J. L., Pruiksma, K. E., Byrd, P., Williams, A. E., McCabe, K. M., & Bartley, E. J. (2011). Physiological predictors of response to exposure, relaxation, and rescripting therapy for chronic nightmares in a randomized clinical trial. *Journal of clinical sleep medicine: JCSM: official publication of the American Academy of Sleep Medicine*, *7*(6), 622–31.

Davis, J. L., & Wright, D. C. (2007). Randomized Clinical Trial for Treatment of Chronic Nightmares in Trauma-Exposed Adults, *20*(2), 123–133. doi:10.1002/jts.

Department of Health (2012). *NHS Choices: Track Your Drinking*. Retrieved 10 February 2013 from: http://www.nhs.uk/Livewell/alcohol/Pages/Alcoholtracker.aspx

Desseilles, M., Dang-Vu, T. T., Sterpenich, V., & Schwartz, S. (2011). Cognitive and emotional processes during dreaming: a neuroimaging view. *Consciousness and cognition*, *20*(4), 998–1008. doi:10.1016/j.concog.2010.10.005

Drake, R., Haddock, G., Tarrier, N., Bentall, R., Lewis, S. (2007). The Psychotic Symptom Rating Scales (PSYRATS): Their usefulness and properties in first episode psychosis. Schizophrenia Research, 89: 119-122.

Dyck, D. G., Short, R., & Vitaliano, P. P. (1999). Predictors of burden and infectious illness in schizophrenia caregivers. *Psychosomatic medicine*, *61*(4), 411–9.

Ehlers, A., & Clark, D. M. (2000). A cognitive model of postraumatic stress disorder. *Behaviour Research*, *38*, 319–345.

Ehlers, Anke, Clark, D. M., Hackmann, A., Mcmanus, F., & Fennel, M. (2005). Cognitive therapy for posttraumatic stress disorder: development and evaluation. *Behaviour Research and Therapy*, *4*, 413–431.

Escamilla, M., LaVoy, M., Moore, B. a, & Krakow, B. (2012). Management of post-traumatic nightmares: a review of pharmacologic and nonpharmacologic treatments since 2010. *Current psychiatry reports*, *14*(5), 529–35.

Evans, C., Margison, F., & Barkhan, M. (1998). The contribution of reliable and clinically significant change methods to evidence-based mental health. *Evidence Based Mental Health*, *1*, 70–72.

Eysenck, M. W., Derakshan, N., Santos, R., & Calvo, M. G. (2007). Anxiety and cognitive performance: attentional control theory. *Emotion (Washington, D.C.)*, *7*(2), 336–53.

Farrarelli, F., Peterson, M., Sarasso, S., Riedner, B., Murphey, M., Benca, R., Bria, P., et al. (2011). Thalamic dysfunction in schizophrenia suggested by whole night deficits in slow and fast spindles, *167*(May 2007), 1339–1348.

Foa, E.B., Cashman, L., Jaycox, L. & Perry, K. (1997). The validation of a self-report measure of posttraumatic stress disorder: The Posttraumatic Diagnostic Scale. *Psychological Assessment* 9(4): 445-451.

Forbes, D., Phelps, A. J., McHugh, A. F., Debenham, P., Hopwood, M., & Creamer, M. (2003). Imagery rehearsal in the treatment of posttraumatic nightmares in Australian veterans with chronic combat-related PTSD: 12-month follow-up data. *Journal of traumatic stress*, *16*(5), 509–13.

Fowler, D., Garety, P., & Kuipers, E. (1995). *Cognitive Behaviour Therapy for Psychosis*. Chichester: John Wiley & Sons.

Freeman, D., Dunn, G., Fowler, D., Bebbington, P., Kuipers, E., Emsley, R., Jolley, S., et al. (2012b). Current Paranoid Thinking in Patients with Delusions: The Presence of Cognitive-Affective Biases. *Schizophrenia bulletin*, 1–7.

Freeman, D., & Garety, P. A. (1999). Worry , worry processes and dimensions of delusions: an exploratory investigation of anxiety processes in the maintenance of delusional distress. *Behavioural and Cognitive Psychotherapy*, *27*, 47–52.

Freeman, D., Garety, P. A, Kuipers, E., Fowler, D., & Bebbington, P. E. (2002). A cognitive model of persecutory delusions. *The British journal of clinical psychology / the British Psychological Society*, *41*(Pt 4), 331–47.

Freeman, D., Pugh, K., Vorontsova, N., & Southgate, L. (2009). Insomnia and paranoia. *Schizophrenia research*, *108*(1-3), 280–4.

Freeman, D., Stahl, D., McManus, S., Meltzer, H., Brugha, T., Wiles, N., & Bebbington, P. (2012a). Insomnia, worry, anxiety and depression as predictors of the occurrence and persistence of paranoid thinking. *Social psychiatry and psychiatric epidemiology*, *47*(8), 1195–203.

Freeman, D., Thompson, C., Vorontsova, N., Dunn, G., Carter, L., Garety, P., Kuipers, E., et al. (2013). Paranoia and post-traumatic stress disorder in the months after a physical assault: a longitudinal study examining shared and differential predictors. *Psychological medicine*, 1–12.

Galletly, C., Hooff, M.V. & McFarlane, A. (2011). Psychotic symptoms in young adults exposed to childhood trauma – a 20 year follow up study. *Schizophrenia Research* 127: 76-82.

Gehrman, P.R. & Harb, G.C. (2010). Treatment of nightmares in the context of posttraumatic stress disorder. *Journal of Clinical Psychology* 66(11): 1185-1194.

Greenfield, S. F., Strakowski, S. M., Tohen, M., Batson, S. C., & Kolbrener, M. L. (1994). Childhood abuse in first-episode psychosis [published erratum appears in Br J Psychiatry 1994 Sep;165:415]. *The British Journal of Psychiatry*, *164*(6), 831–834.

Gujar, N., McDonald, S. A., Nishida, M., & Walker, M. P. (2011). A role for REM sleep in recalibrating the sensitivity of the human brain to specific emotions. *Cerebral cortex (New York, N.Y.: 1991)*, *21*(1), 115–23.

Hackmann, A., Bennett-Levy, J. & Holmes, E.A. (2011). Oxford Guide to Imagery in Cognitive Therapy. New York: Oxford University Press.

Haddock, G., McCarron, J., Tarrier, N. & Faragher, E.B. (1999). Scales to measure dimensions of hallucinations and delusions: The psychotic symptom rating scales (PSYRATS). *Psychological Medicine: A Journal of Research in Psychiatry and the Allied Sciences,* 29(4); 879-889.

Hartigan, N., McCarthy-Jones, S., & Hayward, M. (2013). Hear Today, Not gone Tomorrow? An Exploratory Longitudinal Study of Auditory Verbal Hallucinations (Hearing Voices). *Behavioural and cognitive psychotherapy*, 1–7.

Henderson, C., Corker, E., Lewis-Holmes, E., Hamilton, S., Flach, C., Rose, D., Williams, P., et al. (2012). England's time to change antistigma campaign: one-year outcomes of service user-rated experiences of discrimination. *Psychiatric services (Washington, D.C.)*, *63*(5), 451–7.

Henry, J.D. & Crawford, J.R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct Validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology* 44: 227-239.

Holmes, E. a, Arntz, A., & Smucker, M. R. (2007). Imagery rescripting in cognitive behaviour therapy: images, treatment techniques and outcomes. *Journal of behavior therapy and experimental psychiatry*, *38*(4), 297–305.

Holmes, E. a, & Mathews, A. (2010). Mental imagery in emotion and emotional disorders. *Clinical psychology review*, *30*(3), 349–62.

Holowka, D. W., King, S., Saheb, D., Pukall, M., & Brunet, A. (2003). Childhood abuse and dissociative symptoms in adult schizophrenia. *Schizophrenia research*, *60*(1), 87–90.

Horowitz, M.J. (1986). *Stress Response Syndromes*. 2nd ed. Jason Aronson, New York

Ison, R. (2011). *Intrusive imagery in people who hear voices: a cross sectional study and case series.* Unpublished doctoral thesis, Institute of Psychiatry, King's College London, UK.

Jacobson, N. S., & Truax, P. (1991). Clinical Significance: A Statistical Approach to Denning Meaningful Change in Psychotherapy Research, *59*(1), 12–19.

Janson, C., & Backer, W. De. (1995). Insomnia and Sleep, *18*(7), 589–597.

Jolley, S., Garety, P., Dunn, G., White, J., Aitken, M., Challacombe, F., Griggs, M., et al. (2005). A pilot validation study of a new measure of activity in psychosis. *Social psychiatry and psychiatric epidemiology*, *40*(11), 905–11.

Jolley, S., Garety, P.A., Ellet, L., Kuipers, E., Freeman, D. et al. (2006). A validation of a new measure of activity in psychosis. *Schizophrenia Research* 85: 288-295.

Kayman, D. J., & Goldstein, M. F. (2012). Cognitive Deficits in Schizophrenia. *Current Translational Geriatrics and Gerontology Reports*, *1*(1), 45–52.

Keshavan, M. S., Montrose, D. M., Miewald, J. M., & Jindal, R. D. (2011). Sleep correlates of cognition in early course psychotic disorders. *Schizophrenia research*, *131*(1-3), 231–4.

Kirkbride, J.B., Errazuriz, A., Croudace, T.J., Morgan, C., Jackson, D., McCrone, P., Murray, R.M. & Jones, P.B. (2011). *Systematic review of the incidence and prevalence of schizophrenia and other psychoses in England.* Department of Health Policy Research Programme.

Koffel, E., & Watson, D. (2009). Unusual sleep experiences, dissociation, and schizotypy: Evidence for a common domain. *Clinical psychology review*, *29*(6), 548–59.

Krakow, B., Hollifield, M., Schrader, R., Koss, M., Tandberg, D., Lauriello, J., McBride, L., et al. (2000). A controlled study of imagery rehearsal for chronic nightmares in sexual assault survivors with PTSD: a preliminary report. *Journal of traumatic stress*, *13*(4), 589–609.

Krakow, B. (2006). Nightmare complaints in treatment-seeking patients in clinical sleep medicine settings: diagnostic and treatment implications. *Sleep*, *29*(10), 1313–9. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/17068985

Kuipers, E., Garety, P., Fowler, D., Freeman, D., Dunn, G., & Bebbington, P. (2006). Cognitive, emotional, and social processes in psychosis: refining cognitive behavioral therapy for persistent positive symptoms. *Schizophrenia bulletin*, *32 Suppl 1*, S24–31. doi:10.1093/schbul/sbl014

Kuipers, E., Onwumere, J., & Bebbington, P. (2010). Cognitive model of caregiving in psychosis. *The British Journal of Psychiatry*, *196*, 259–265.

Laroi, F., & Aleman, A. (2010). *Hallucinations: A guide to treatment and management*. Oxford: Oxford University Press.

Lavie, P., Pillar, G., & Malhotra, A. (2002). *Sleep Disorders: Diagnosis Management and Treatment*. London: Martin Dunitz.

Leskin, G. a, Woodward, S. H., Young, H. E., & Sheikh, J. I. (2002). Effects of comorbid diagnoses on sleep disturbance in PTSD. *Journal of psychiatric research*, *36*(6), 449–52.

Levin, R., & Fireman, G. (2002). Nightmare prevalence, nightmare distress, and self-reported psychological disturbance. *Sleep*, *25*(2), 205–12. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11902430

Li, S. X., Zhang, B., Li, A. M., & Wing, Y. K. (2010). Prevalence and correlates of frequent nightmares: a community-based 2-phase study. *Sleep*, *33*(6), 774–80.

Lockley, S. W., & Foster, R. G. (2012). *Sleep: A Very Short Introduction*. Oxford: Oxford University Press.

Lombardi, C.M. & Hurlbert, S.H. (2009). Misprescription and misuse of one tailed tests. Australia Ecology, 34: 447-468.

Long, M. E., Hammons, M. E., Davis, J. L., Frueh, B. C., Khan, M. M., Elhai, J. D., & Teng, E. J. (2011). Imagery rescripting and exposure group treatment of posttraumatic nightmares in Veterans with PTSD. *Journal of anxiety disorders*, *25*(4), 531–5.

Lovibond, P.F. & Lovibond, S.H. (1995a). The structure of negative emotional states: comparison of the depression anxiety stress scale (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy* 33(3): 335-343.

Lovibond, S.H. & Lovibond, P.F. (1995b). *Manual for the Depression Anxiety Stress Scales* (2nd Ed.). Sydney: Psychology Foundation.

Marwaha, S., & Johnson, S. (2004). Schizophrenia and employment - a review. *Social psychiatry and psychiatric epidemiology*, *39*(5), 337–49.

McGrath, J. J. (2006). Variations in the incidence of schizophrenia: data versus dogma. *Schizophrenia bulletin*, *32*(1), 195–7.

Morrison, A. P. (2004). The use of imagery in cognitive therapy for psychosis: a case example. *Memory*, *12*(4), 517–24.

Morrison, A.P., Frame, L. & Larkin, W. (2003). Relationship between trauma and psychosis: a review and integration. *British Journal of Clinical Psychology* 42: 331-353.

Mullen, P. E. (2006). Schizophrenia and violence: from correlations to preventive strategies. *Advances in Psychiatric Treatment*, *12*(4), 239–248.

Myers, E., Startup, H., & Freeman, D. (2011). Cognitive behavioural treatment of insomnia in individuals with persistent persecutory delusions: a pilot trial. *Journal of behavior therapy and experimental psychiatry*, *42*(3), 330–6.

Nappi, C. M., Drummond, S. P. a, Thorp, S. R., & McQuaid, J. R. (2010). Effectiveness of imagery rehearsal therapy for the treatment of combat-related nightmares in veterans. *Behavior therapy*, *41*(2), 237–44.

NCCMH (2010) *Schizophrenia: Core Interventions in the Treatment and Management of Schizophrenia in Adults in Primary and Secondary Care.* Updated edition. Leicester and London: The British Psychological Society and the Royal College of Psychiatrists. [Full guideline]

Neria, Y., Bromet, E.J., Sievers, S., Lavelle, J., Fochtmann, L.J. (2002). Trauma exposure and posttraumatic stress disorder in psychosis: Findings from a first-admission cohort. *Journal of Consulting and Clinical Psychology* 70(1): 246-251.

Neylan, T. C., Marmar, C. R., Metzler, T. J., Weiss, D. S., Zatzick, D. F., Delucchi, K. L., Wu, R. M., et al. (1998). Sleep disturbances in the Vietnam generation: findings from a nationally representative sample of male Vietnam veterans. *The American journal of psychiatry*, *155*(7), 929–33.

NHS Choices. (2012). Schizophrenia. Retrieved May 7, 2013, from http://www.nhs.uk/Conditions/Schizophrenia/Pages/Introduction.aspx

NICE (2009) *Schizophrenia: Core Interventions in the Treatment and Management of Schizophrenia in Adults in Primary and Secondary Care.* NICE clinical guideline 82. Available at www.nice.org.uk/CG82 [NICE guideline]

Nielsen, T., & Levin, R. (2007). Nightmares: a new neurocognitive model. *Sleep medicine reviews*, *11*(4), 295–310. doi:10.1016/j.smrv.2007.03.004

National Institute of Mental Health (2013). How is schizophrenia treated? *National Institute of Mental Health: Transforming the Understanding and Treatment of Mental Illness through Research*. Retrieved May 13, 2013, from: http://www.nimh.nih.gov/health/publications/schizophrenia/how-is-schizophrenia-treated.shtml

Nishida, M., Pearsall, J., Buckner, R. L., & Walker, M. P. (2009). REM sleep, prefrontal theta, and the consolidation of human emotional memory. *Cerebral cortex19*(5), 1158–66.

Nuechterlein, K. H., Barch, D. M., Gold, J. M., Goldberg, T. E., Green, M. F., & Heaton, R. K. (2004). Identification of separable cognitive factors in schizophrenia. *Schizophrenia research*, *72*(1), 29–39.

Ohayon, M. M., & Morselli, P. L. (1997). Parasomnias Prevalence of Nightmares and Their Relationship to Psychopathology and Daytime Functioning in Insomnia Subjects, *20*(5), 340–348.

Palmer, B. A., Pankratz, V. S., & Bostwick, J. M. (2013). The Lifetime Risk of Suicide in Schizophrenia. *Archives of General Psychiatry*, *62*, 247–253.

Picken, A. & Tarrier, N. (2011). Trauma and comorbid posttraumatic stress disorder in individuals with schizophrenia and substance abuse. *Comprehensive Psychiatry*, 52: 490-497.

Pigeon, W. R., Pinquart, M., & Conner, K. (2012). Meta-analysis of sleep disturbance and suicidal thoughts and behaviors. *The Journal of clinical psychiatry*, *73*(9), e1160–7.

Read, J., Goodman, L., Morrison, A. P., Ross, C., & Aderhold, V. (2004). Childhood trauma, loss and stress. In Read, J., Mosher, L., Bentall, R. *Models of Madness: Psychological Social and Biological Approaches to Schizophrenia*. New York: Brunner-Routledge.

Robert, G. & Zadra, A. (2008). Measuring nightmare and bad dream frequency: impact of retrospective and prospective instruments. *Journal of Sleep Research*, 17: 132-139.

Ruhrmann, S., Schultz-Lutter, F., Salokangas, R., Heinimaa, M., Liszen, D., Dingemans, P., & et al. (2013). Prediction of Psychosis in Adolescents and Young Adults at High Risk. *Archives of General Psychiatry*, *67*(3), 241–251.

Schulze, K. (2009). *Intrusive mental imagery in people with persecutory delusions*. Unpublished doctoral thesis, Institute of Psychiatry, King's College London, UK.

Schredl, M. (2009). Dreams in patients with sleep disorders. *Sleep medicine reviews*, *13*(3), 215–21.

Semiz, U. B., Basoglu, C., Ebrinc, S., & Cetin, M. (2008). Nightmare disorder, dream anxiety, and subjective sleep quality in patients with borderline personality disorder. *Psychiatry and Clinical Neurosciences*, 62, 48–55.

Serruya, G., & Grant, P. (2009). Cognitive-Behavioral Therapy of Delusions: Mental Imagery within a Goal-Directed Framework. *Journal of Clinical Psychology*, *65*(8), 791–802.

Shaw, K., McFarlane, A. C., Bookless, C., & Air, T. (2002). The aetiology of postpsychotic posttraumatic stress disorder following a psychotic episode. *Journal of traumatic stress*, *15*(1), 39–47.

Simor, P., Bódizs, R., Horváth, K., & Ferri, R. (2013). Disturbed dreaming and the instability of sleep: altered nonrapid eye movement sleep microstructure in individuals with frequent nightmares as revealed by cyclic alternating pattern. *Sleep*, *36*(3), 413–9.

Slade, P. D. (1972). The effect of systematic desensitisation on auditory hallucinations. *Behaviour research and therapy*, *10*(4), 85–91.

Spoormaker, V. I. (2008). A cognitive model of recurrent nightmares, *International Journal of Dream Research*, *1*(1), 15–22.

Steel, C., Garety, P. A., Freeman, D., Craig, E., Kuipers, E., Bebbington, P., Fowler, D., et al. (2007). The multidimensional measurement of the positive symptoms of psychosis, *16*(2), 88–96.

Sündermann, O., Onwumere, J., Bebbington, P., & Kuipers, E. (2012). Social networks and support in early psychosis: potential mechanisms. *Epidemiology and psychiatric sciences*, (October 2012), 1–4.

Swanson, L. M., Favorite, T. K., & Arnedt, J. T. (2009). A Combined Group Treatment for Nightmares and Insomnia in Combat Veterans: A Pilot Study, *22*(6), 639–642.

Szpakowka, K. (2003). *Behind Closed Eyes: Dreams and Nightmares in Ancient Egypt*. Swansea: The Classical Press of Wales.

Tarrier, N. (2005). Cognitive behaviour therapy for schizophrenia -- a review of development, evidence and implementation. *Psychotherapy and psychosomatics*, *74*(3), 136–44.

The Schizophrenia Commission. (2012). *The abandoned illness: a report from the Schizophrenia Commission*. London: Rethink Mental Illness.

Thornicroft,G., Tansella,M., Becker,T., Knapp,M., Leese,M., Schene,A., & Vazquez-Barquero,J.L. (2004). The personal impact of schizophrenia in Europe. *Schizophrenia Research*, *69*(2-3), 125-132.

Thünker, J., & Pietrowsky, R. (2012). Effectiveness of a manualized imagery rehearsal therapy for patients suffering from nightmare disorders with and without a comorbidity of depression or PTSD. *Behaviour research and therapy*, *50*(9), 558–64.

Tribl, G. G., Wetter, T. C., & Schredl, M. (2013). Dreaming under antidepressants: A systematic review on evidence in depressive patients and healthy volunteers. *Sleep medicine reviews*, *17*(2), 133–42.

Ulmer, C. S., Edinger, J. D., & Calhoun, P. S. (2011). A multi-component cognitive-behavioral intervention for sleep disturbance in veterans with PTSD: a pilot study. *Journal of clinical sleep medicine: JCSM: official publication of the American Academy of Sleep Medicine*, *7*(1), 57–68.

Van Liempt, S. (2012). Sleep disturbance and PTSD: a perceptual circle. *European Journal of Psychotraumatology*, *3*, 19142. Retrieved from http://dx.doi.org/10.3402/ejpt.v3i0.19142

Van Liempt, S., Arends, J., Cluitmans, P. J. M., Westenberg, H. G. M., Kahn, R. S., & Vermetten, E. (2013). Sympathetic activity and hypothalamo-pituitary-adrenal axis activity during sleep in post-traumatic stress disorder: a study assessing polysomnography with simultaneous blood sampling. *Psychoneuroendocrinology*, *38*(1), 155–65. doi:10.1016/j.psyneuen.2012.05.015

Wamsley, E. J., Tucker, M. A., Shinn, A. K., Ono, K. E., Mckinley, S. K., Ely, A. V, Goff, D. C., et al. (2013). schizophrenia: Mechanisms of impaired memory consolidation, *71*(2), 154–161.

Ward, T. (2010). Evaluation of the use of the 'Clinical Outcomes in Routine Evaluation - Outcome Measure' (CORE-OM) with Clients with Severe & Enduring Mental Illness. Unpublished report.

Wechsler, D. (1998). Wechsler Memory Scale – Third Edition. London: The Psychological Corporation.

Wilson, S., & Argyropoulos, S. (2012). Sleep in schizophrenia: time for closer attention. *The British journal of psychiatry: the journal of mental science*, *200*(4), 273–4.

Woods S.W. (2003): Chlorpromazine equivalent doses for the newer atypical antipsychotics. *Journal of Clinical Psychiatry* 64:663-667.

World Health Organisation. (2010). *International Statistical Classification of Diseases and Related Health Problems-10th revision* (Vol. 2). Retrieved from http://www.who.int/classifications/icd/ICD10Volume2_en_2010.pdf

Wulff, K., Dijk, D.-J., Middleton, B., Foster, R. G., & Joyce, E. M. (2012). Sleep and circadian rhythm disruption in schizophrenia. *The British journal of psychiatry: the journal of mental science*, *200*(4), 308–16.

Wykes, T., Steel, C., Everitt, B., & Tarrier, N. (2008). Cognitive behavior therapy for schizophrenia: effect sizes, clinical models, and methodological rigor. *Schizophrenia bulletin*, *34*(3), 523–37.

Young, J., Klosko, J., & Weishaar, M. (2003). *Schema Therapy: A Practitioner's Guide*. New York: Guildford Publications.

10. Appendices

10. 1. Appendix 1: Poster for clinical waiting areas

Institute of Psychiatry

at The Maudsley

Bryony Sheaves
Department of Psychology
Third Floor ASB PO78
Institute of Psychiatry
London SE5 8AF
Tel. 07977629247
Email: bryony.sheaves@kcl.ac.uk

Version 2 – 13 January 2012

KING'S College LONDON Founded 1829

RESEARCH PROJECT

We are running a research study investigating sleep patterns in people who have experienced unusual, worrying or distressing experiences or beliefs

Whether you sleep very well, or have had sleep difficulties we would like to hear from you.

Taking part involves meeting with a researcher for around an hour and a half to complete questionnaires about your sleep, your mental health and how you spend your time

You can find out more details by speaking to your care co-ordinator or by contacting:
Bryony Sheaves
Tel No: 07977629247
Bryony.sheaves@kcl.ac.uk

This study has received ethical approval by: City Rd & Hampstead Research Ethics Committee (Ref: 11/LO/2045)

10. 2. Appendix 2: Participant Information Sheet – Study A

Institute of Psychiatry

at The Maudsley

Bryony Sheaves
Department of Psychology
Third Floor ASB PO78
Institute of Psychiatry
London SE5 8AF
Tel. 07977629247
Email: bryony.sheaves@kcl.ac.uk

KING'S College LONDON Founded 1829

PARTICIPANT INFORMATION SHEET- PART A

Version 2 – 13 January 2012

Project Title: **An Investigation of Nightmares, Sleep Disturbance and Psychosis with a case series of Imagery Rehearsal Training (IRT)**

Please take time to read the following information carefully. Talk to others about the study if you wish.

You are being invited to take part in a research study. Before you decide whether to take part it is important that you understand why the research is being done and what it would involve for you. Ask us if there is anything that is not clear or if you would like more information. Take your time to decide whether or not you wish to take part.

What is the purpose of the study?

The study aims to understand more about the sleep experiences of people who have experience of psychosis. In particular we are interested to find out more about nightmares, how common they are, how distressing they are and how they affect daily living. Nightmares are thoughts or images that occur when one is asleep. Because they are upsetting they cause the person to wake from sleep. We are aiming to speak to around 40 people with experience of psychosis about their sleep experiences. We want to find out if they experience nightmares, if so, how frequently and how they might be affected by them both at night and during the day. We are interested to find out about everybody's sleep experiences so it does not matter if you sleep very well or have difficulties; you are still able to take part.

Why have I been asked to take part?

We are inviting people into the study through your mental health team. We are inviting any adult who has experienced unusual or distressing beliefs or experiences.

Do I have to take part?

No. It is up to you to decide whether or not to take part.

What will happen to me if I decide to take part?

Participation involves one meeting with the researcher, Bryony Sheaves, to complete a face-to-face interview and some questionnaires. You may take comfort breaks at any point during the meeting.

Interview/Questionnaires: You will be asked a variety of questions, mostly by questionnaire. If you prefer not to write you can ask the researcher to fill in the questionnaires on your behalf. You will be asked some information about yourself (e.g. your age, gender, alcohol use) and some questions about your past and current medical history. The researcher will ask about your sleep, including your experience of dreams and nightmares over the two weeks prior to the interview. They will ask how frequently you have nightmares, if at all, how distressing, vivid and intense they are. We would also like to learn what strategies you use to help with your sleep. The researcher will also ask you to fill in some questionnaires related to your experiences of psychosis, your mood, if you have had past traumatic experiences, how you spend your days and a questionnaire to measure day to day distress.

If you choose to take part in the study we will have access to your medical records at South London and Maudsley NHS Foundation Trust.

Will I be reimbursed for any expenses?

Yes, we will offer you £10 to cover your expenses

Will my information be confidential?

All of your answers to the questionnaires will be kept anonymously and will be identifiable only by a number, not by your name.

All information supplied to the researchers will be treated as strictly confidential and stored anonymously (using a code) so you cannot be identified from the data. Your name will be kept separately, with the number, on a database and on paper so that we can identify your questionnaires in the future if we need to (for example, if you decide you no longer want to be part of the study). We will only identify your questionnaires for a reason like this. Paper copies of questionnaires will be kept securely by the researchers in a locked filing cabinet in a locked office. Your details will be kept for up to 12 years, and then will be confidentially destroyed. We will keep a completely anonymised copy of the database indefinitely, from which you will not be able to be identified at all.

We will inform your clinical team that you are taking part in the study. The information you give will usually be available only to the research team. However, the researcher will share with your clinical team any important information that is relevant to the care you receive. In addition, should you give any information, such as criminal disclosures, or information relating to your own or others safety, which requires action, including passing on information to others, the research team will take appropriate actions.

What are the possible risks of taking part?

It is not expected that participation in the study has any risks.

However, some people may find it upsetting to talk about their experiences. If you find any of the questions asked upsetting and would like to talk about this, please let your researcher know who will offer you regular breaks or stop the session, if needed. During the study, you will have the opportunity to talk about your upset if you want to and/or to engage in some relaxation exercises which can be helpful in reducing distress.

What are the possible benefits of taking part?

There are no direct benefits for you from taking part in the research. However, we hope that the information collected will help us to understand better the sleep experiences in people who experience psychotic symptoms. This may help the development of better psychological treatments to reduce distress in the future.

What should I do if I have any problems?

If you are concerned about any aspect of this study, please speak to the researcher to clarify any queries.

If you remain unhappy and wish to complain formally, you can do this through the NHS Complaints Procedure. Details can be obtained from your local hospital or team base.

Although we do not expect the study to have any risks, in the event that you are harmed due to the research and this is due to someone's negligence then you may have grounds for a legal action for compensation against King's College London but you may have to pay for your legal costs. The normal NHS complaints mechanisms will still be available to you (if appropriate).

Who has reviewed the study?

All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee, to protect your safety, rights, wellbeing and dignity. This study has been reviewed by the City Road and Hampstead Research Ethics Committee (11/LO/2045)

What will happen to the results of the study?

A summary of the results will be submitted to a scientific journal for publication and written up as a doctoral thesis by Bryony Sheaves. No-one will be able to identify you in the description of the study. If you are interested in a written summary of the findings of the study, please tick the box on the consent form.

Who is carrying out the study?

The study is being carried out by Bryony Sheaves in part fulfilment of a doctorate qualification. The research includes Professor Elizabeth Kuipers, Dr Nadine Keen, and Dr Juliana Onwumere from the Department of Psychology at the Institute of Psychiatry, King's College London.

Contact for further information

If you have any questions about the study or are unsure whether you qualify to take part, you are welcome to discuss your participation, in confidence, with Bryony Sheaves: bryony.sheaves@kcl.ac.uk (**tel:** 07977629247)

10. 3. Appendix 3: Participant Information sheet – Study B

Institute of Psychiatry

at The Maudsley

Bryony Sheaves
Department of Psychology
PO78
Institute of Psychiatry
London SE5 8AF
Tel. 07977629247
Email: bryony.sheaves@kcl.ac.uk

KING'S College LONDON Founded 1829

PARTICIPANT INFORMATION SHEET- PART B
Version 2 – 13 January 2012

Project title: **An Investigation of Nightmares, Sleep Disturbance and Psychosis with a case series of Imagery Rehearsal Training (IRT)**

Please take time to read the following information carefully. Talk to others about the study if you wish.

You are being invited to take part in a research study. Before you decide whether to take part it is important that you understand why the research is being done and what it would involve for you.

Ask us if there is anything that is not clear or if you would like more information. Take your time to decide whether or not you wish to take part.

What is the purpose of the study?

This part of the study will investigate how a process called 'Imagery Rehearsal Training' might be used to change the content of the nightmares. We hope to find out if changing the content of the nightmares to a more pleasant ending will change the amount of distress that people experience due to their nightmare and whether it affects the frequency of the nightmare and effect daytime functioning. We are looking for around 5 people who have already completed section A of the study to complete section B. These should be people who can remember their nightmare.

Why have I been asked to take part?

You have been asked to take part because you completed part A of the study and have current experiences of distressing nightmares.

Do I have to take part?

No. It is up to you to decide whether or not to take part.

What will happen to me if I decide to take part?

Participation will involve meeting with the researcher, Bryony Sheaves, for three to four meetings, over the course of approximately 5 weeks. The first and last session will take around an hour and a half to complete, the meetings in between should take a little less. You are welcome to take comfort breaks and can discuss this with the researcher at the start of the appointments.

Prior to meeting 1: The researcher will post you some dream logs to note down any dreams/nightmares that you may have experienced one week prior to the first meeting. These should take 5 minutes to complete each morning for a week.
Meeting 1: The researcher will ask you to complete some additional questionnaires. They will provide some information about sleep and nightmares and explain the idea behind the Imagery Rehearsal Training Treatment. You will also practice some guided imagery of a pleasant place/situation. You will be provided with a CD of this imagery to take home and listen to.
Meeting 2: This session will focus on the nightmare you chose in session one. With the researcher you will create an alternative, less distressing ending to your nightmare and practice imagining this ending in a lot of detail using the guided imagery technique learnt in session one.
Letter/CD: The researcher will write a summary of the nightmare including the more pleasant and alternative ending and send it to you in the post. Alternatively, if it is more convenient for you, you can be provided with a recording of your 're-scripted' nightmare on CD. You will be asked to listen to/read the re-scripted nightmare each day.
Meeting 3 or 4: You will be invited to return for the final session. We will review your progress together and adapt the nightmare re-script if necessary. If you feel you would benefit from a fourth session this can be arranged at this time with the researcher. In the final meeting, you will be asked to complete the same questionnaires as the ones you have just completed in the first part of the study.

Will I be reimbursed for any expenses?

Yes, we will offer you £10 at session one and an additional £10 at the last session, to cover your expenses

Will my information be confidential?

All of your answers to the questionnaires will be kept anonymously and will be identifiable only by a number, not by your name.

All information supplied to the researchers will be treated as strictly confidential and stored anonymously (using a code) so you cannot be identified from the data. Your name will be kept separately, with the number, on a database and on paper so that we can identify your questionnaires in the future if we need to (for example, if you decide you no longer want to be part of the study). We will only identify your questionnaires for a reason like this. Paper copies of questionnaires will be kept securely by the researchers in a locked filing cabinet in a locked office. Your details will be kept for up to 12 years, and then will be confidentially destroyed. We will keep a completely anonymised copy of the database indefinitely, from which you will not be able to be identified at all.

You may be asked if you would be happy for sessions to be recorded on a Dictaphone. You will be asked if you are happy for sessions to be recorded on the consent form for the study. If you would prefer not to be recorded, you can still take part in the study. If you do agree, the recordings will be stored on an encrypted, password protected memory stick, which will be stored securely in a locked cabinet in a locked office.

We will inform your clinical team that you are taking part in the study. The information you give will usually be available only to the research team. However, the researcher will share with your clinical team any important information that is relevant to the care you receive. In addition, should you give any information, such as criminal disclosures, or information relating to your own or others safety, which requires action, including passing on information to others, the research team will take appropriate actions.

What are the possible risks of taking part?

It is not expected that participation in the study has any risks.

However, some people may find it upsetting to talk about their nightmares. If you do find that you become upset and would like to talk about this, please let your researcher know who will offer you regular breaks or stop the session, if needed. During the study, you will have the opportunity to talk about your upset if you want to and/or to engage in some relaxation exercises which can be helpful in reducing distress. If you feel you require further support after a session your researcher can contact your care team.

What are the possible benefits of taking part?

Other research has found that imagery rehearsal training reduces the frequency of nightmares and reduces how distressing they are. However, this research was carried out with people who suffer with post-traumatic stress disorder rather than psychosis. We want to find out if it benefits people with nightmares and psychosis. In making your decision to take part, you therefore need to remember that it is possible that imagery rehearsal training will have no effect on your nightmares.

We hope that the information collected will help us to understand better the experiences of people who have nightmares in the context of psychosis. This may help the development of better psychological treatments to reduce distress in the future.

What should I do if I have any problems?

If you are concerned about any aspect of this study, please speak to the researcher to clarify any queries.

If you remain unhappy and wish to complain formally, you can do this through the NHS Complaints Procedure. Details can be obtained from your local hospital or team base.

Although we do not expect the study to have any risks, in the event that you are harmed due to the research and this is due to someone's negligence then you may have grounds

for a legal action for compensation against King's College London but you may have to pay for your legal costs. The normal NHS complaints mechanisms will still be available to you (if appropriate).

Who has reviewed the study?

All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee, to protect your safety, rights, wellbeing and dignity. This study has been reviewed by the City Road and Hampstead Research Ethics Committee (11/LO/2045)

What will happen to the results of the study?

A summary of the results will be submitted to a scientific journal for publication and written up as a doctoral thesis by Bryony Sheaves. No-one will be able to identify you in the description of the study. If you are interested in a written summary of the findings of the study, please tick the box on the consent form.

Who is carrying out the study?
The study is being carried out by Bryony Sheaves in part fulfilment of a doctorate qualification. The research includes Professor Elizabeth Kuipers, Dr Nadine Keen, and Dr Juliana Onwumere from the Department of Psychology at the Institute of Psychiatry, King's College London.

Contact for further information
If you have any questions about the study or are unsure whether you qualify to take part, you are welcome to discuss your participation, in confidence, with Bryony Sheaves: bryony.sheaves@kcl.ac.uk (**tel:** 07977629247)

10. 4 Appendix 4: General Information Questionnaire – Study A

Institute of Psychiatry

at The Maudsley

Bryony Sheaves
Department of Psychology
3rd Floor
Addiction Science Building
Institute of Psychiatry
London
SE5 8AF
Tel. 07977629247
Email. Bryony.sheaves@kcl.ac.uk

KING'S College LONDON Founded 1829

GENERAL INFORMATION QUESTIONNAIRE

Title of Project: An Investigation of Nightmares, Sleep Disturbance and Psychosis with a case series of Imagery Rehearsal Training (IRT)

Name of Researcher: Bryony Sheaves

Date: _____

Participant number: _____

TO BE COMPLETED BY THE PARTICIPANT

Gender: **M** ☐ **F** ☐

Age: _____

Ethnicity:_____

In the past week (i.e. the past 7 days) how much alcohol have you consumed?_____

Researcher to calculate units of alcohol_____

In the past two weeks (i.e. the last 14 days) have you taken any non-prescribed drugs?

YES ☐ **NO** ☐

IF YES, what did you take?

_____

How much did you take?_____

When did you take it?_____

What prescribed medications are you currently taking?

Medication Name	Dose	Purpose of the medication	Side effects you experience as a result of the medication

Please tell us any strategies that you use to help you sleep.

These might be things you do (E.g. keeping the radio on in the background), things you eat or drink, prescribed or non-prescribed medications, things you think about or try not to think about. We are interested in anything you have tried, to help you to sleep.

10. 5. Appendix 5: Pittsburgh Sleep Quality Index

Pittsburgh Sleep Quality Index (Buysee et al., 1989)

Answers should indicate sleep habits for the majority of days over the past month.

1. What time have you usually gone to bed at night? Bed time_____
2. During the past month, how long in minutes has it usually taken you to fall asleep? ___ minutes
3. What time have you usually gotten up in the morning? Getting up time_____
4. During the past month, how many hours of actual sleep did you get at night? _____hours

5. During the past month, how often have you had trouble sleeping because you:

   A) Cannot get to sleep within 30 minutes?
      - Not during the past month
      - Less than one per week
      - Once or twice per week
      - Three or more times per week

   B) Wake up in the middle of the night or early in the morning?
      - Not during the past month
      - Less than one per week
      - Once or twice per week
      - Three or more times per week

   C) Have to get up to use the bathroom?
      - Not during the past month
      - Less than one per week
      - Once or twice per week
      - Three or more times per week

   D) Cannot breath comfortably
      - Not during the past month
      - Less than one per week
      - Once or twice per week
      - Three or more times per week

   E) Cough or snore loudly
      - Not during the past month
      - Less than one per week
      - Once or twice per week
      - Three or more times per week

   F) Feel too cold
      - Not during the past month
      - Less than one per week
      - Once or twice per week

- Three or more times per week

G) Feel too hot
- Not during the past month
- Less than one per week
- Once or twice per week
- Three or more times per week

H) Had bad dreams
- Not during the past month
- Less than one per week
- Once or twice per week
- Three or more times per week

I) Have pain
- Not during the past month
- Less than one per week
- Once or twice per week
- Three or more times per week

J) Other reasons: Please describe_____
- Not during the past month
- Less than one per week
- Once or twice per week
- Three or more times per week

6. Over the past month, how would you rate your sleep quality overall?
   Very good ____
   Fairly good____
   Fairly bad ____
   Very bad ____
7. During the past month how often have you taken medicine to help you sleep? (Prescribed of over the counter?)
   - Not during the past month
   - Less than one per week
   - Once or twice per week
   - Three or more times per week
8. During the past month how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?
   - Not during the past month
   - Less than one per week
   - Once or twice per week
   - Three or more times per week
9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?
   - No problem at all
   - Only a very slight problem
   - Somewhat of a problem
   - A very big problem

10. 6. Appendix 6: Dream Log – study A

Institute of Psychiatry

at The Maudsley

Bryony Sheaves
Department of Psychology
3rd Floor
Addiction Science Building
Institute of Psychiatry
London
SE5 8AF
Tel. 07977629247
Email. Bryony.sheaves@kcl.ac.uk

KING'S College LONDON Founded 1829

Dream Log

The following questions ask you about your nightmares over the past two weeks.

Over the past two weeks, how many nightmares have you experienced?

_____

If you have experienced at least one nightmare over the past two weeks please pick the worst nightmare to answer the questions below.

How intense was the nightmare?

Not intense at all						Very Intense
1	2	3	4	5	6	7

How vivid was the nightmare?

Not vivid at all						Very vivid
1	2	3	4	5	6	7

How distressing did you find the nightmare?

Not distressing at all						Very distressing
1	2	3	4	5	6	7

****[For study B, the dream log was completed each morning, asking how many nightmares the participant had experience the previous night, followed by the above questions about intensity, vividness, distress and recurrence]**

10. 7. Appendix 7: PSYRATS for Hallucinations

Psychotic Symptom Rating Scales (Haddock et al, 1999)

PSYRATS - Auditory hallucinations
(rating period over the last week)
Length of time experiencing voices: *How long ago did you start hearing voices?* **__years __ months**

1 Frequency *How often do you experience voices? E.g. every day, all day long, etc*

0 Voices not present or present less than once a week
1 Voices occur for at least once a week
2 Voices occur at least once a day
3 Voices occur at least once an hour
4 Voices occur continuously or almost continuously i.e. stop for only a few seconds or minutes

2 Duration *When you hear your voices, how long do they last? A few seconds, minutes, hours, all day long?*

0 Voices not present
1 Voices last for a few seconds, fleeting voices
2 Voices last for several minutes
3 Voices last for at least one hour
4 Voices last for hours at a time

3 Location *When you hear voices, where do t hey sound like they're coming from? - Inside your head and/or outside your head?- If voices sound like they are outside your head, whereabouts do they sound like they are coming from?*

0 No voices present
1 Voices sound like they are inside head only
2 Voices outside the head, but close to ears or head. Voices inside the head may also be present.
3 Voices sound like they are inside or close to ears and outside head away from ears.
4 Voices sound like they are from outside the head only.

4 Loudness *How loud are your voices? Are they louder than your voice, about the same loudness, quieter or just a whisper?*

0 Voices not present
1 Quieter than own voice, whispers.
2 About same loudness as own voice
3 Louder than own voice
4 Extremely loud, shouting

5 Controllability *Do you think you have any control over when your voices happen? Can you dismiss or bring on your voices?*

0 Subject believes they can have control over the voices and can always bring on or dismiss them at will

1 Subject believes they can have some control over the voices on the majority of occasions
2 Subject believes they can have some control over their voices approximately half of the time
3 Subject believes they can have some control over their voices but only occasionally. The majority of the time the subject experiences voices which are uncontrollable
4 Subject has no control over when the voices occur and cannot dismiss or bring them on at all.

6 Beliefs re-origin of voices. W*hat do you think has caused your voices? Are the voices caused by factors related to yourself or solely due to other people or factors? If patient expresses an external origin: How much do you believe that your voices are caused by ___ __ _____ (add patient's contribution) on a scale from 0 – 100 with 100 being that you are totally convinced, have no doubts and 0 being that it is completely untrue?*

0 Voices not present
1 Believes voices to be solely internally generated and related to self
2 Holds <50% conviction that voices originate from external causes
3 Holds >=50% conviction that voices originate from external causes
4 Believes voices are solely due to external causes (100% conviction)

7 Amount of negative content

Can you give me some examples of what the voices say? Do your voices say unpleasant things or negative things? How much of the time do the voices say these types of unpleasant or negative items?

0 No unpleasant content
1 Occasional unpleasant content (<10%)
2 Minority of voice content is unpleasant or negative (<50%)
3 Majority of voice content is unpleasant or negative (>=50%)
4 All of voice content is unpleasant or negative

8 Degree of negative content (Rate using criteria on scale, asking patient for more detail if necessary)

0 Not unpleasant or negative
1 Some degree of negative content, but not personal comments relating to self or family e.g. swear words or comments not directed to self, e.g. `the milkman's ugly'
2 Personal verbal abuse, comments on behaviour e.g. `shouldn't do that or say that'
3 Personal verbal abuse relating to self-concept e.g. `you're lazy, ugly, mad, perverted'
4 Personal threats to self e.g. threats to harm self or family, extreme instructions or commands
to harm self or others

9 Amount of distress *Are your voices distressing? How much of the time?*

0 Voices not distressing at all
1 Voices occasionally distressing, majority not distressing (<10%)
2 Minority of voices distressing (<50%)

3 Majority of voices distressing, minority not distressing (>=50%)
4 Voices always distressing

10 Intensity of distress *When voices are distressing, how distressing are they? Do they cause you minimal, moderate, severe distress? Are they the most distressing they have ever been?*

0 Voices not distressing at all
1 Voices slightly distressing
2 Voices are distressing to a moderate degree
3 Voices are very distressing, although subject could feel worse
4 Voices are extremely distressing, feel the worst he/she could possibly feel

11 Disruption to life *How much disruption do the voices cause your life? Do the voices stop you from working or other daytime activity? Do they interfere with your relationships with friends and/or family? Do they interfere with your ability to look after yourself, e.g. bathing, changing clothes, etc?*

0 No disruption to life, able to maintain social and family relationships (if present)
1 Voices causes minimal amount of disruption to life e.g. interferes with concentration although able to maintain daytime activity and social and family relationships and be able to maintain independent living without support
2 Voices cause moderate amount of disruption to life causing some disturbance to daytime activity and/or family or social activities. The patient is not in hospital although may live in supported accommodation or receive additional help with daily living skills
3 Voices cause severe disruption to life so that hospitalisation is usually necessary. The patient is able to maintain some daily activities, self-care and relationships while in hospital. The patient may also be in supported accommodation but experiencing severe disruption of life in terms of activities, daily living skills and}or relationships
4 Voices cause complete disruption of daily life requiring hospitalization. The patient is unable to maintain any daily activities and social relationships. Selfcare is also severely disrupted.

10. 8. Appendix 8: Voice Power Differential Scale

Voice Power Differential Scale

(Birchwood, Meaden, Trower, Gilbert & Plaistow, 2000)

Client's Name:..... Date Assessed.....
Please circle the number which best describes how you feel in relation to your Voice

1	**2**	**3**	**4**	**5**
I am much more powerful than my voice	I am more powerful than my voice	We have about the same amount of power as each other	My voice is more powerful than me	My voice is much more powerful than me
1	**2**	**3**	**4**	**5**
I am much stronger than my voice	I am stronger than my voice	We are as strong as each other	My voice is stronger than me	My voice is much stronger than me
1	**2**	**3**	**4**	**5**
I am much more confident than my voice	I am more confident than my voice	We are as confident as each other	My voice is more confident than me	My voice is much more confident than me
5	**4**	**3**	**2**	**1**
I respect my voice much more than they respect me	I respect my voice more than they respect me	We respect each other about the same	My voice respects me more than I respect them	My voice respects me much more than I respect them
1	**2**	**3**	**4**	**5**
I am much more able to harm my voice than they are able to harm me	I am more able to harm my voice than they are able to harm me	We are equally able to harm each other	My voice is more able to harm me than I am able to harm them	My voice is much more able to harm me than I am able to harm them
1	**2**	**3**	**4**	**5**
I am greatly superior to my voice	I am superior to my voice	We are equal to each other	My voice is superior to me	My voice is greatly superior to met

1	2	3	4	5
I am much more knowledgeable than my voice	I am more knowledgeable than my voice	We have about the same amount of knowledge as each other	My voice is more knowledgeable than me	My voice is much more knowledgeable than me

10. 9. Appendix 9: PSYRATS - Delusions

Psychotic Symptom Rating Scales (Haddock et al, 1999)
PSYRATS – Delusions

(ratings over past week)
1 Preoccupation *In the last week, how much time did you spend thinking of your beliefs? All the time/daily/weekly etc.?*

0 No delusions, or delusions which the subject thinks about less than once a week
1 Subject thinks about beliefs at least once a week
2 Subject thinks about beliefs at least once a day
3 Subject thinks about beliefs at least once an hour
4 Subject thinks about delusions continuously or almost continuously

2 Duration of preoccupation with delusions *When beliefs come into your mind, how long do they persist? Few seconds/minutes/hours?*

0 No delusions
1 Thoughts about beliefs last for a few seconds, fleeting thoughts
2 Thoughts about delusions last for several minutes
3 Thoughts about delusions last for at least 1 hour
4 Thoughts about delusions usually last for hours at a time

3 Conviction *(at the time of interview)* *At the present time how concerned are you that your beliefs are true? Can you estimate this on a scale from 0 - 100, where 100 means that you are totally convinced by your beliefs and 0 being that you are not convinced at all?*

0 No conviction at all
1 Very little conviction in reality of beliefs,<10%
2 Some doubts relating to conviction in beliefs, between 10-49%
3 Conviction in belief is very strong, between 50-99%
4 Conviction is 100%

4 Distress *Do your beliefs cause you distress? How much of the time do they cause you distress?*

0 Beliefs never cause distress
1 Beliefs cause distress on the minority of occasions
2 Beliefs cause distress on <50% of occasions
3 Beliefs cause distress on the majority of occasions when they occur between 50-99% of time
4 Beliefs always cause distress when they occur

5 Intensity of distress *When your beliefs distress you, how severe does this feel?*

0 No distress
1 Beliefs cause slight distress
2 Beliefs cause moderate distress
3 Beliefs cause marked distress

4 Beliefs cause extreme distress, could not be worse

Disruption to life *How much disruption do your beliefs cause you? - Do they prevent you working or carrying out a daytime activity? - Do they interfere with your relationships with family or friends? - Do they interfere with your ability to look after yourself, e.g. washing, changing clothes, etc.?*

0 No disruption to life, able to maintain independent living with no problems in daily living skills.
Able to maintain social and family relationships (if present)

1 Beliefs cause minimal amount of disruption to life, e.g. interferes with concentration although able to maintain daytime activity and social and family relationships and be able to maintain independent living without support

2 Beliefs cause moderate amount of disruption to life causing some disturbance to daytime activity and/or family or social activities. The patient is not in hospital although may live in supported accommodation or receive additional help with daily living skills

3 . The patient is able to maintain some daily activities, self-care and relationships while in hospital. The patient
maybe also be in supported accommodation but experiencing severe disruption of life in terms of activities, daily living skills and}or relationships

4 Beliefs cause complete disruption of daily life requiring hospitalization. The patient is unable to maintain any daily activities and social relationships. Selfcare is also severely disrupted.

10.10. Appendix 10: Persecutor Power Differential

Persecutor Power Differential Scale

(Adapted from the Voice Power Differential Scale VPD
Birchwood, Meaden, Trower, Gilbert & Plaistow, 2000)

Client's Name:..... **Date Assessed**.....
Please circle the number which best describes how you feel in relation to your Persecutor

1	**2**	**3**	**4**	**5**
I am much more powerful than my Persecutor	I am more powerful than my Persecutor	We have about the same amount of power as each other	My Persecutor is more powerful than me	My Persecutor is much more powerful than me
1	**2**	**3**	**4**	**5**
I am much stronger than my Persecutor	I am stronger than my Persecutor	We are as strong as each other	My Persecutor is stronger than me	My Persecutor is much stronger than me
1	**2**	**3**	**4**	**5**
I am much more confident than my Persecutor	I am more confident than my Persecutor	We are as confident as each other	My Persecutor is more confident than me	My Persecutor is much more confident than me
5	**4**	**3**	**2**	**1**
I respect my Persecutor much more than they respect me	I respect my Persecutor more than they respect me	We respect each other about the same	My Persecutor respects me more than I respect them	My Persecutor respects me much more than I respect them
1	**2**	**3**	**4**	**5**
I am much more able to harm my Persecutor than they are able to harm me	I am more able to harm my Persecutor than they are able to harm me	We are equally able to harm each other	My Persecutor is more able to harm me than I am able to harm them	My Persecutor is much more able to harm me than I am able to harm them
1	**2**	**3**	**4**	**5**
I am greatly superior to my Persecutor	I am superior to my Persecutor	We are equal to each other	My Persecutor is superior to me	My Persecutor is greatly superior to met
1	**2**	**3**	**4**	**5**
I am much more knowledgeable than my Persecutor	I am more knowledgeable than my Persecutor	We have about the same amount of knowledge as each other	My Persecutor is more knowledgeable than me	My Persecutor is much more knowledgeable than me

10. 11. Appendix 11: DASS-21 (Lovibond & Lovibond, 1995a)

DASS21

ID Number: *Date:*

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical	0	1	2	3

	exertion (eg, sense of heart rate increase, heart missing a beat)				
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

10. 12. Appendix 12: Time Budget Questionnaire (Jolley al., 2006)

Time Budget Measure

Introduction

The following guidelines should be read before administration.

1. The measure should be completed for a typical week (e.g. not one when the respondent was unusually unwell, or in hospital) unless an atypical week is particularly required.

2. Start the week with whatever 'yesterday' was – this should be easier for participants to remember. Prompt if memory is poor. Ask about any known activities, or activities emerging as a pattern (e.g. 'when did you get up'; 'did you have breakfast?'; 'what did you do then?'; 'you go to the day centre, don't you – did you do that in the afternoon?'). If the week is very repetitive, it is OK to say – was that morning the same? Anything different? Normalise lack of activity for some time periods, empathise with difficulties particularly if client is upset by lack of activity. Normalise difficulty remembering. Try to help the respondent as much as possible. See Appendix 1 for prompt questions.

3. Stick to usual times of day when determining which box to complete. For example, if the person does not get up until lunchtime, score the morning as sleeping (0) and fill in the rest of the day from lunchtime onwards. If the person goes to bed late with lots of evening activities, these should still go in the 'evening' box, and can only achieve a maximum score of 4.

4. All activities should be noted, without judgement. Even where activities are deemed inappropriate by the interviewer, these should still be added and scored. It is quite usual for people to have 0 and 1 scores for time periods in their week, even when functioning quite highly. E.g. common behaviours such as having a lie in will receive a 0, and watching TV a 1.

5. Complete the additional questions. Note new and resumed activities (Q1) in the relevant columns.

6. Each time period is given a score (Appendix 2). Scoring is based degree of planning, complexity and effort required.

Time Budget Measure

Name:……. Date:…….

We are interested in finding out a bit more about how you spend your time. This would include activities outside the home, such as work, study, any groups or centres that you attend, how you spend your leisure time, as well as home-based things for example, watching TV, reading, cooking and housework.

I would also like to know about social activities- seeing or going out with friends, talking on the phone, chatting to neighbours or other people and so on.

Thinking about the past week, perhaps we could divide up each day and think about what you can remember doing? Has the past week been an average week for you?

M Morning	N	R	Middle of Day	N	R	Afternoon	N	R	Evening	N	R
T Morning	N	R	Middle of Day	N	R	Afternoon	N	R	Evening	N	R
W Morning	N	R	Middle of Day	N	R	Afternoon	N	R	Evening	N	R
T Morning	N	R	Middle of Day	N	R	Afternoon	N	R	Evening	N	R
F Morning	N	R	Middle of Day	N	R	Afternoon	N	R	Evening	N	R

S Morning	N	R	Middle of Day	N	R	Afternoon	N	R	Evening	N	R
S Morning	N	R	Middle of Day	N	R	Afternoon	N	R	Evening	N	R

1. Are any of the activities that you have just told me about things that you have recently taken up, or things that you had previously stopped doing but have recently restarted? By recently, I mean within the past six months? (go through each day of the week)

2. Are there any things that you are not doing at the moment, but have plans to do, or would like to do in the future?

3. Do you live with, or see a lot of, a family member or someone with whom you have a caring relationship? How much time each week do you spend in face to face contact with them?

4. How satisfied are you with what you have been doing in the past week on a scale of 1-5, with 1 = not satisfied, and 5 = very satisfied?

1 2 3 4 5

5. If you are not satisfied, what would need to happen to make you more satisfied?

10.13. Appendix 13: Scatter plots indicating non-significant correlations

The following scatter plots indicate the non-significant correlations from hypothesis 3 (3.4.3).

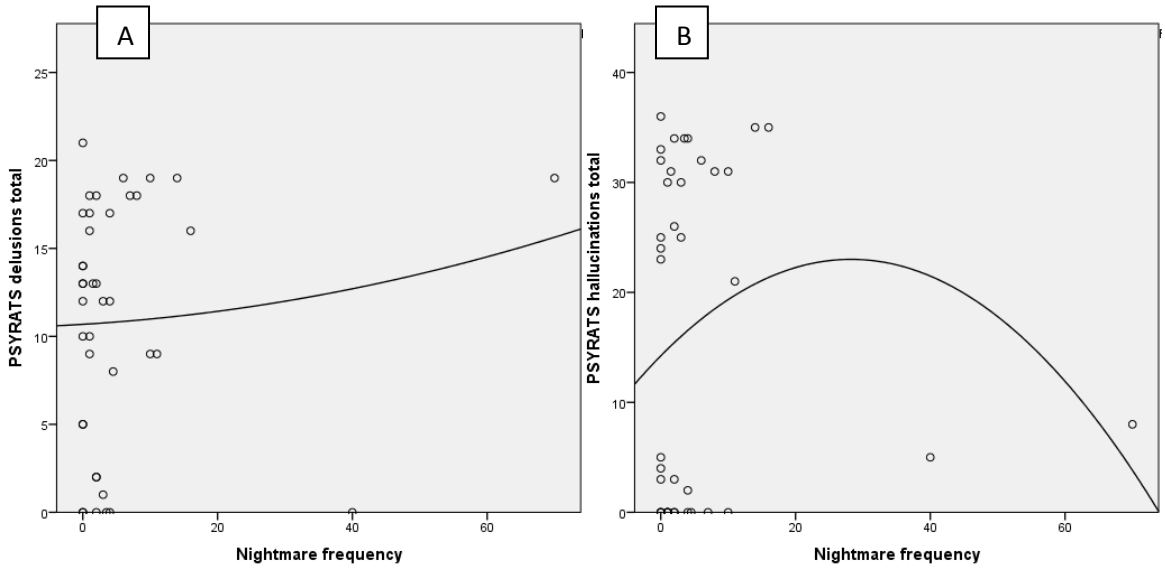

Figure 10.13.1. Scatter plots indicating nightmare frequency as a function of A) PSYRATS measured hallucinations and B) PSYRATS measured delusions. Trend line indicates the quadratic R^2 (A =.04, B= .02).

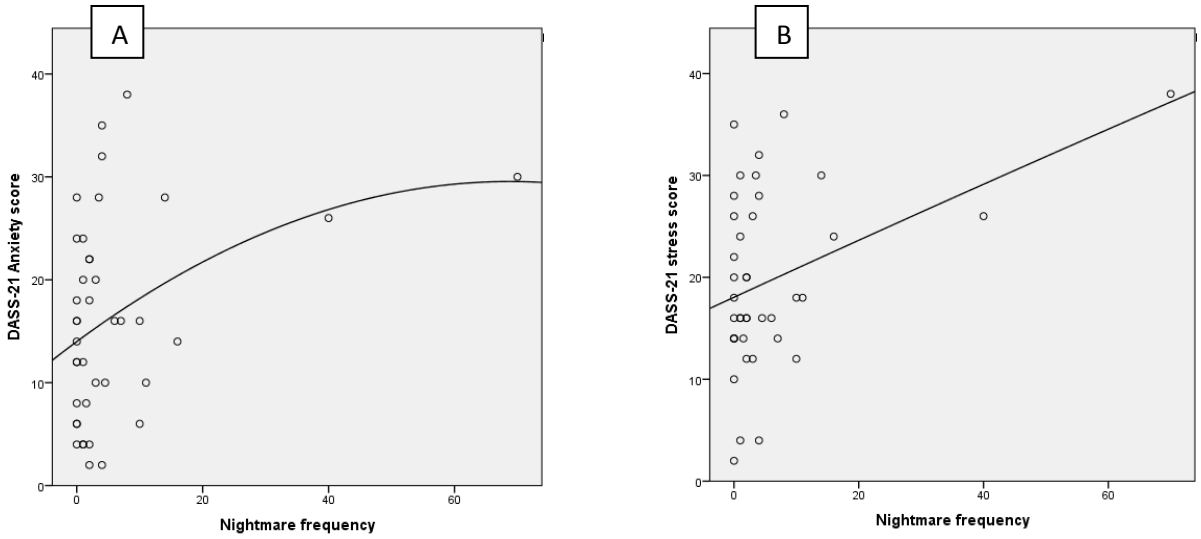

Figure 10.13.2. Scatter plots indicating nightmare frequency as a function of A) DASS-21 measured anxiety and B) DASS-21 measured stress. Trend line indicates the quadratic R^2 (A =.12, B= .16).

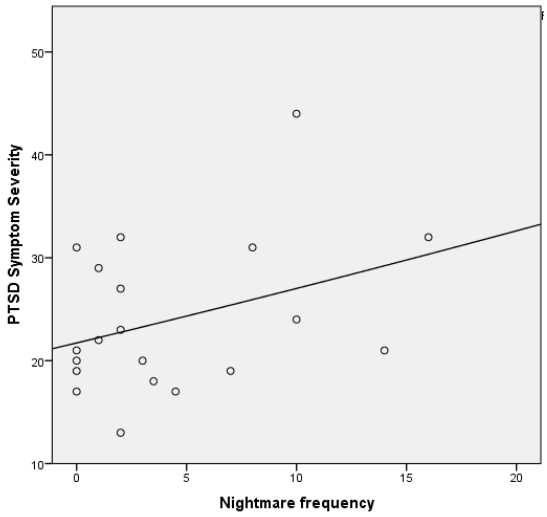

Figure 10.13.3. Scatter plot indicating nightmare frequency as a function of PTSD symptom severity, measured by the PDS. Trend line indicates the quadratic R^2 (.13).

The following scatter plots illustrate non-significant correlations from hypothesis 4 (3.4.4).

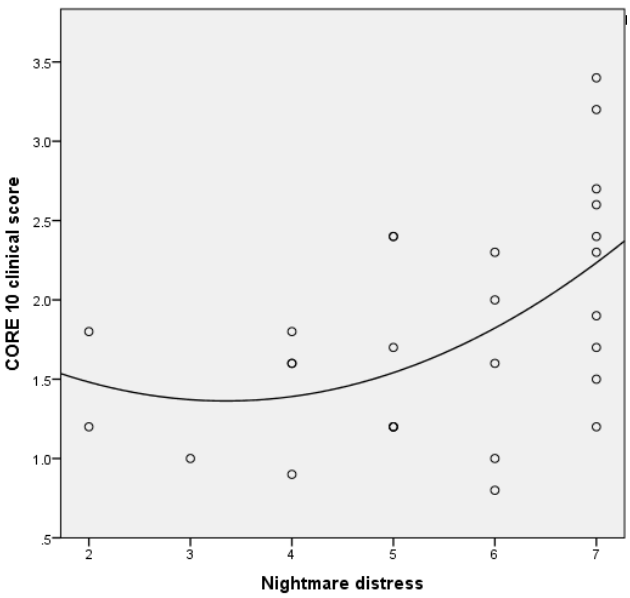

Figure 10.13.4. Scatter plot indicating nightmare distress as a function of CORE-10 measured global distress. Trend line indicates the quadratic R^2 (.26).

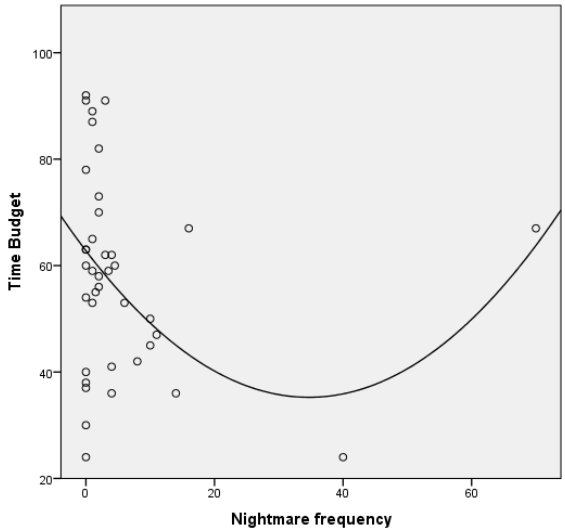

Figure 10.13.5. Scatter plot indicating nightmare frequency as a function of daily acitivites, measured by the Time Budget Questionnaire. Trend line indicates the quadratic R^2 (.12).

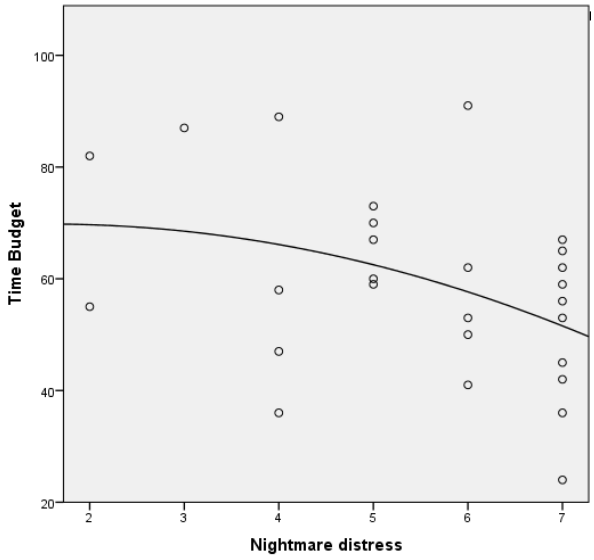

Figure 10.13.6. Scatter plot indicating nightmare distress as a function of daily activities, measured by the Time Budget Questionnaire. Trend line indicates the quadratic R^2 (.16).

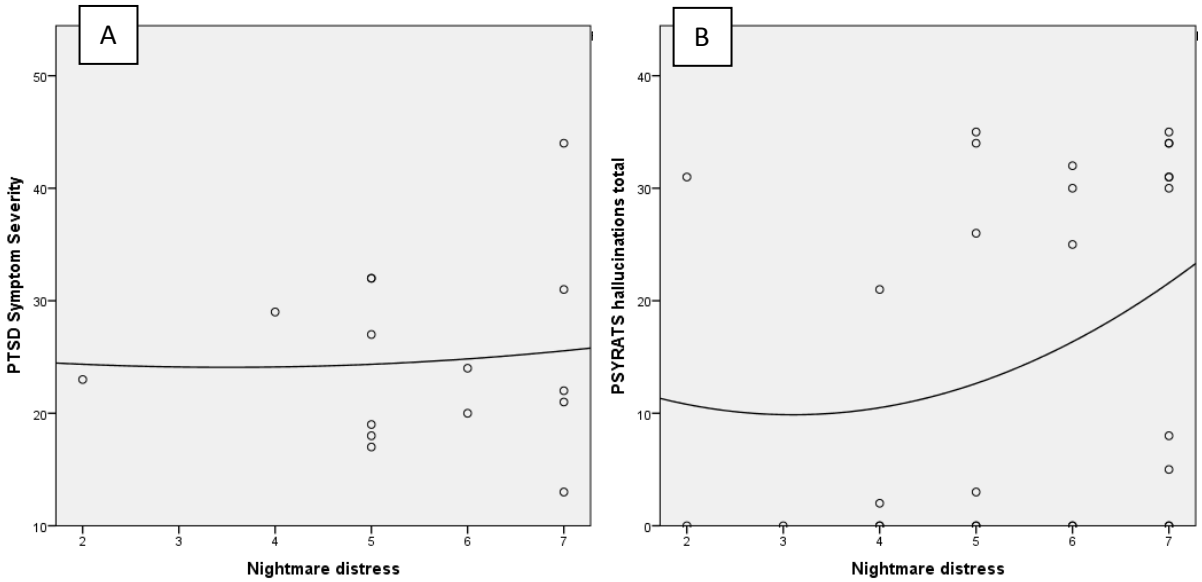

Figure 10.13.7. Scatter plot indicating nightmare distress as a function of A) PTSD Symptom severity and B) PSYRATS hallucinations total. Trend line indicates the quadratic R^2 (A=.01, B=.09).

10.14 Original Nappi et al. (2010, p. 238-240) protocol

Session 1 focused upon psychoeducation about sleep, nightmares, imagery, and the theoretical basis of IRT. Initial sleep and nightmare assessments were completed and a daily nightmare log was introduced. Veterans were instructed to document, each morning, the nightly frequency and intensity (on a 1-to-10 Likert-type scale where 0=extremely disturbing) of nightmares, defined as dreams that elicit negative affect and are experienced as distressing.

In Session 2, veterans learned guided pleasant imagery, developed a personalized pleasant imagery scene, and established an imagery rehearsal schedule. Veterans were to practice pleasant imagery for 10 minutes at least two times daily and document these sessions on the nightmare log.

Session 3 started with a review of veteran adherence to the pleasant imagery rehearsal schedule, which was documented on the nightmare log. Compliance difficulties were addressed. Behavioral strategies to improve compliance were suggested and a “dose response” curve (i.e., relationship between length of time spent rehearsing imagery and likelihood of nightmare reduction) was emphasized. Session 3 also included “rescripting” of nightmares. Veterans selected one nightmare they wished to change (the target nightmare). Therapists suggested the target nightmare should be one that occurs with frequency (i.e., more than 1x/week). Ultimately, however, veterans were free to rescript any nightmare of their choosing. Among participating veterans reported upon here, 97.1% (n=33) elected to rescript a nightmare related to a past traumatic event. Of these, 84.8% were related to military service. Using Krakow and Neidhardt's (1992) directions to change the nightmare “any way you wish,” therapists taught veterans to identify and elaborate on an alternative, neutral and/or pleasant ending for the target nightmare (the “rescript”). Specifically, therapists guided veterans in writing a highly detailed, vivid, and creative alternative ending that did not elicit negative affect or include distressing content from the target nightmare. The alternative ending was attached to the target nightmare in such a way that only non-distressing nightmare content from the target nightmare was present in the rescript. Veterans practiced visual imagery of the rescripted nightmare in session and were assigned imaginal rehearsal of the “new dream” at least twice daily for 10 minutes.

Session 4 involved review of treatment progress and compliance with imagery rehearsal, adjustment of rescript and/or imagery schedules, and identification of potential barriers to treatment compliance. Common barriers included difficulty focusing on the rescripted imagery and experience of negative intrusive thoughts and/or negative affect during imagery rehearsal. The former was addressed by identification of environmental factors that compromised ability to concentrate (e.g., cell phone, noisy room) and review of behavioral strategies to refocus attention back on the imagery (e.g., snapping a rubber band on wrist, reorienting to the written script, etc.). Intrusive thoughts were countered most often by encouraging the veteran to change from imaginal rehearsal to reading and focusing on the written version of the rescript. Once the intrusive thoughts subsided, veterans were to return to imaginal rehearsal. If that strategy was ineffective and/or if imagery consistently elicited negative thoughts and/or feelings, the therapist worked with the veteran to identify and remove distressing elements from the rescript.

Session 5 emphasized relapse prevention. Specifically, treatment success and/or failures were reviewed and veterans had the opportunity to demonstrate self-efficacy for the rescripting and imagery skills. Only one nightmare was rescripted in the course of therapy; however, veterans were encouraged to apply the rescripting process on their own if they experienced other distressing nightmares in the future. Sessions 4 and 5 were integrated in individual treatments if veterans exhibited rapid acquisition of imagery skill or if veteran's schedule prohibited attendance at Session 5. For the purposes of this study, completion of four sessions was considered a full course of treatment (since acquisition of the treatment intervention skill occurred at Session 3 and no new skills were introduced after Session 3).

The treatment was initially offered in an individual format that was structured, but not formally manualized. However, due to high demand in the clinic, the treatment was manualized and offered in group format (with two co-therapists, one of whom was typically the first author). This maximized the number of veterans treated in a timely manner. Determination of participation in individual or group IRT was based solely on flexibility of veterans' schedules (i.e., ability to attend the established time for group sessions). Other than self-report of distressing nightmares, no other distinguishing characteristics were used to determine group composition. As such, groups contained a mix of veterans from different service eras and with (or without) various comorbid conditions (see Participants, below).

10.15. Therapy protocol

The method of Imagery Rehearsal Training has been adapted from that used by Nappi, Drummond, Thorp & McQuaid, (2010). Therapy will be delivered in an individualised approach and incorporating a degree of flexibility (for example in session number and length) as recommended in Fowler et al.'s (1995) CBT for psychosis manual. For a detailed description of imagery techniques, see Hackmann, Bennett-Levy & Holmes (2011).

Therapy phase	Procedure
1	Additional questionnaires completed and dream logs passed to the researcher. Psycho-education about sleep, nightmares, imagery and the theoretical basis for IRT. May include learning guided imagery through the development of personalised pleasant imagery scene. This will be recorded in session and participants will be encouraged to listen to the CD prior to the second session. Alternatively, the researcher can type a written script and send it to the participant.
2	Rescripting of one target nightmare (suggest one that occurs frequently, ie. more than once per week). Participants to be taught to identify or elaborate an alternative neutral and/or pleasant ending. This is done by guiding participants to write a highly detailed, vivid and creative ending that does not elicit negative affect or include distressing content from the target nightmare. This alternative ending will be explored in much detail through imagery, eliciting as much sensory information as possible (including visual, auditory, olfactory and tactile detail where appropriate). The alternative ending will be attached to the original nightmare, just prior to the moment of maximum affect.
Letter	The researcher will write a summary of the re-script and post to the participant and/or send a CD recording of the transcript. The CD may be a more accessible means of rehearsal for those who hear voices. Participants will be encouraged to read the re-script or listen to the CD once per day, before going to bed.
3	Participants will be invited to return for a review of progress. Adaptations to the re-script will be made, as appropriate. Barriers to rehearsing the rescript at home will be discussed and problem solved.
4	There will be optional additional sessions for those who feel that further adaptations to the re-script would be beneficial. At the end of the final session participants will complete the post-IRT measures.

10.16 Strategies for enhancing imagery vividness and immediacy. (Hackman, Bennett-Levy & Holmes, 2011, p.67-68)

"

1. Get a detailed description of the environment in which the event takes place: 'where are you? What colour is the room? What is in the room? How does it smell? What's the temperature?
2. Focus in particular on bodily feelings. When asking about other elements of the image (e.g. emotions, thoughts, and behaviour), it is often helpful to lead with imagery of physical feelings and sensations (e.g. heart rate, tingling, the pit of the stomach, or body temperature). 'What are you feeling in your body? Where do you feel it? What's that like? How extensive is it?' The therapist picks up any metaphors that the clients might use, and reflects these back: 'so it feels as if you have a big black hole in the pit of your stomach'
3. Emphasise that images can be multi-sensory: ask about visual, auditory, kinaesthetic, tactile, and olfactory elements; or explore felt senses and atmospheres.
4. Get rich detail, such as 'Imagine you are a film director. I can't see the film. Explain exactly what's happening, and what you can see to me'.
5. Have the client adopt a 'field perspective' where they live the experience from the inside. This should be: 'As you are looking at the wall, what are you noticing?' rather than an observer perspective, where the client is looking on at the experience as if an 'outsider': 'As you see yourself looking at the wall, what do you notice?'
6. Ask the client to use the first-person present tense, recounting the experience as if it is happening to them now ('I am running down the road, being chased...'). if at first this is experienced as too threatening, the client might start from the observer perspective using the past tense: 'see yourself back then, six months ago, running down the road, being chased...' The therapist can then move the client to the first person, present tense, as they gain confidence in their ability to cope with high emotion.
7. Explicitly name different parts or aspects of self which may be present in the same image, so that the client is clear which 'self' is centre stage at any given time (e.g. adult john, 8 year old John).
8. Keep checking with client to make sure they are staying with the process, and that the image is clear (e.g. 'Tell me what you are seeing. What's happening in your body? Where are you now?')
9. Ask specific questions at certain points: 'What are you learning from this experience; about yourself, about other people, about life in general?'

"

Service Related Project

An Evaluation of the Cost Effectiveness of the Psychological Intervention Clinic for outpatients with Psychosis (PICuP)

Supervised by:
Dr Louise Johns
Consultant Clinical Psychologist
PICuP Clinic

Contents

Abstract:

Objective: To investigate whether the cost of care for patients decreased following Cognitive Behavioural Therapy for psychosis (CBTp), delivered by a specialist clinic. ***Method:*** Cost of care was defined as use of high cost services including inpatient stays and home treatment or crisis resolution care. Electronic medical records were searched to identify the number of days using high cost services. Service cost data were used to convert service use into cost per patient per month (N = 70), which was compared one year prior to, during and one year following therapy. ***Results:*** Overall, cost of care per month was not significantly lower following therapy. Sub-group analysis however revealed that those who utilised high cost services prior to entering therapy significantly decreased in care costs in the twelve months following cessation of therapy. ***Conclusion:*** For participants recently in receipt of high intensity care, care costs decreased after provision of specialist therapy.

1. Introduction

1.1 Aim:

To evaluate the cost effectiveness of a specialised psychology service for outpatients with psychosis. Cost effectiveness will be determined by evaluating the number of inpatient admissions and contacts with home treatment teams before, during and after psychological intervention. The primary outcome of this data analysis will be to inform Primary Care Trusts, individual referrers and tertiary referral funding panels about the cost effectiveness of the service. As a secondary outcome, the data will inform clinic therapists of relapse rates prior to, and following therapy which can inform the emphasis on relapse prevention offered within this therapeutic context.

1.2 The PICuP clinic

The Psychological Intervention Clinic for out-patients with Psychosis (PICuP) is a specialist tertiary service, which previously ran under the umbrella of the National Psychosis Unit. Since the advent of Clinical Academic Groups (CAGs) in 2010, PICuP is now part of the Psychosis Recovery Care Pathway. PICuP offers Cognitive Behavioural Therapy (CBT) for individuals with distressing positive symptoms of psychosis or individuals with emotional difficulties in the context of a history of psychosis. CBT is known to be efficacious with psychosis, and is recommended by the NICE Schizophrenia Guideline (NICE, 2009).

PICuP has received almost 600 referrals over the last 9 years, 58.5% are males, with an average age of 38 years (range 15-67). 52% are from BME populations. Although PICuP receives referrals nationally, 92% of referrals come from the seven boroughs of the South East London Sector, with Southwark and Lambeth being the highest referrers.

1.3 Why assess cost-effectiveness?

Given that PICuP is a specialist tertiary NHS service, therapy costs are met by Primary Care Trusts on a cost per case basis. Individual referrers are required to consider the clinical benefits of referring to a specialist service, as well as the cost of the proposed specialist treatment. An audit of referrers to the PICUP clinic revealed that 90.6% thought that PICuP was either “useful” or “very useful” (Miles, H. et al. 2007) suggesting that referrers believe there to be clinical benefits to referring patients to the PICuP clinic. In addition 91% of service-users reported feeling satisfied/very satisfied with the therapy they receive and clinical effectiveness of PICuP therapy has been demonstrated on a range of outcomes including voices, delusions, depression, anxiety and quality of life (PICuP Business

Report 2012). However, the clinical cost before and after this therapy has not yet been explored. The analysis from the current evaluation could assist Primary Care Trusts, referrers and tertiary referral panels to make informed decisions regarding the cost of care in referring patients to this specialist service for outpatients with psychosis.

1.4 The economic burden of schizophrenia and related psychotic disorders

Kirkbride et al. (2011) reviewed 147 individual studies for the Department of Health in order to estimate the incidence, prevalence and economic burden of schizophrenia in England. They report the annual incidence of all psychotic disorders to be 32 cases per 100,000, with an annual prevalence rate of 4 people per 1000. Based on these prevalence data they suggest an annual economic cost of £8.8 billion for those with schizophrenia and £5.0 billion for other affective psychoses. For schizophrenia alone, £4.1 billion of the estimated total cost (47%) is due to lost employment, whilst 40% of the cost is due to service related costs. £1.7 billion of the service cost (49%) is due to the cost of inpatient services. This differs from those with affective psychosis, with a reported 80% of costs arising from the National Health Service (NHS).

The above study highlights the large economic impact of psychosis on society, as well as pinpointing areas in which savings could be made. The data suggest that the cost of NHS care generally and an inpatient admission in particular is a useful outcome measure for evaluating the economic benefits of a treatment. In the current study, we ask whether investing in PICUP's specialist therapy service might later result in a reduction in the economic burden of psychosis, as represented by reduced inpatient stays and home treatment team contacts.

1.5 Why look at inpatient and home treatment data?

The full NICE Guideline (NCCMH, 2010) states that 'inpatient treatment is by far the most costly healthcare component in the overall treatment of schizophrenia' (p. 32). In 2006-07 there were 34,407 reported inpatient admissions, totalling 2,232,724 inpatient days for schizophrenia alone. This represents 34% of all psychiatric bed days (NCCMH, 2010). Given both the cost and the number of inpatient admissions related to schizophrenia, it is an appropriate measure of the cost effectiveness of therapy.

Crisis Resolution and Home Treatment Teams aim to avoid admitting acutely ill people to hospital by providing intensive home-based support (NCCMH, 2010). The teams provide 'any type of crisis

oriented treatment of an acute psychiatric episode by staff with a specific remit to deal with such situations, in and beyond office hours' (p. 354, NCCMH, 2010). In this way, the introduction of such teams served to reduce the need for inpatient admissions by providing high cost community based support at the point of crisis.

Given that the nature of both inpatient and home treatment care is to provide high intensity support, they are associated with high cost. The average cost of one day on an acute ward is £312 (Curtis, 2011). Given that the NICE guidelines suggest figures of 2,232,724 inpatient days across 34,407 admissions, this works out to be an average of 65 days per admission. It can therefore be estimated that an average cost per admission amounts to approximately £20,246. Curtis (2011) reports that the average cost per case of treatment with a Crisis Resolution/Home Treatment team amounts to £30,592. This figure is determined by a team member cost, divided by their case load. Given that crisis teams hold a case load of approximately two cases per year per team member, their cost per case is significantly higher than that of a Community Mental Health Team (CMHT). The cost per case for CMHT support amounts to only £2,523 (£28,069 less than for a crisis resolution/home treatment team). This lower figure is attributable to the lower intensity of support and lower duration of support (CMHT's do not provide support 24 hours a day, 7 days a week). This lower intensity allows for an increased caseload of 27 cases per staff member. The above calculations highlight the validity of utilising inpatient and Crisis Team/Home treatment team care as a measure of high care costs before, during and following therapy with the PICUP clinic.

1.6 Cognitive Behavioural Therapy (CBT) for psychosis:

The PICuP clinic offers Cognitive Behavioural Therapy (CBT) for psychosis. This form of therapy is a 'structured and time limited approach to the management of the problems of people with psychosis' (p. 83, Fowler, Garety & Kuipers, 1995). CBT began its development in the 1950's when Albert Ellis considered the role of therapy was to help a client understand the role that his beliefs played in their own emotional pain. Since this time, CBT has been shown to be efficacious for a range of disorders and is currently recommended for people with psychosis as an adjunct to medication (NICE, 2009). CBT for psychosis (CBTp) aims to make links between people's feelings and their patterns of thinking, which underpins their distress (Jones et al, 2010). A highly individualised approach that fosters therapeutic engagement is adopted in order to reach shared goals. A meta-analysis has indicated that CBTp has a modest effect on positive symptoms of psychosis (0.37), negative symptoms (0.44), functioning (0.38) and mood (0.36) (Wykes et al. 2008). The full NICE guidelines (NCCMH, 2010)

report that when compared with standard care alone, CBT 'was effective at reducing rehospitalisation rates up to 18 months following the end treatment' (p.266), and that the duration in hospital is also reduced by an average of 8.26 days.

1.7 Existing literature evaluating cost effectiveness of CBT for psychosis

There is a paucity of methodologically rigorous studies evaluating the cost effectiveness of CBTp. Three studies have indicated that despite the cost of providing therapy, CBTp is associated with no increased health related costs and a fourth study revealed increased costs following CBT. Kuipers et al. (1998) carried out a post-hoc economic evaluation of a randomised controlled trial (RCT) of CBTp. In comparison to those receiving standard care, those who received CBT reported improved clinical outcomes. The cost analysis revealed that the average monthly cost of CBT per patient was low: £123. Despite this added cost for the intervention group, the overall cost of care was no higher than for standard care alone. Unfortunately, as the economic analysis was performed after the initial RCT, the number of participants was too low to have enough power to detect significant differences between groups.

Startup et al. (2005) evaluated two-year clinical gains and health costs following CBTp in the acute stage of psychosis. In addition to the assessment of psychotic symptoms and overall functioning, health economic data were obtained from hospital, community, residential and primary care, including medication. Compared with treatment as usual, those who received CBTp maintained improvements in symptoms and social functioning two years following the index admission. Analysis of costs revealed that the total health cost over the 2 year period was not significantly different for the CBT group, compared with the treatment as usual group. This was true despite the added mean cost of £769 for provision of CBTp in the treatment condition. This study indicates that CBTp is associated with clinical gains over a two year period with no evidence that provision of therapy increases the total cost of care. On the basis of the studies by Kuipers et al. (1998) and Startup et al. (2005), in addition to the clinical benefits, the full NICE Schizophrenia Guideline (NCCMH, 2010) concludes that CBT is potentially a cost effective intervention for people with acute psychosis or medication resistant schizophrenia.

Peters et al. (2010) ran a trial within a routine clinical setting (PICuP) to evaluate CBTp, delivered by non-expert therapists. An economic evaluation was carried out using the Client Service Receipt Inventory which assessed health and social care service use as well as informal care provided by

family/friends. These data were self-reported by patients and converted to monetary value using unit costs for particular services and professionals. A waiting-list control design was used such that participants were allocated to immediate therapy or therapy after nine months wait. Economic evaluation indicated that the immediate therapy group showed no significant increase in care costs when compared to the waiting list control despite the additional cost of therapy. In addition, when the waiting list control received therapy nine months later, their care costs did not significantly increase. This finding suggests that the addition of CBTp to treatment as usual need not necessarily increase patient cost.

The fourth study to evaluate cost effectiveness for CBTp found an increase in costs related to CBTp. Van der Gaag et al. (2011) carried out cost effectiveness analysis for CBTp in comparison to treatment as usual. This multi-site RCT utilised a measure of 'time functioning in the normal range' (p. 59) which was defined by measures of social functioning compared to the general population, minimal suffering and minimal effect of persistent psychotic symptoms on daily living. Results indicated that implementing CBTp gave participants increased number of days functioning within the normal range; however provisions of CBTp was accompanied by higher overall costs. The increased cost in the CBTp group was mostly accounted for by a small proportion of participants who were long stay inpatients when they entered the study; CBT was not considered to either cause or lengthen their inpatient stay. This study shows firstly that despite the fact that CBT improved health outcomes, this was not sufficient to decrease overall health related costs. Secondly it highlights the influence of hospital admissions on the cost of care in those with psychosis.

Although the literature to date is clear that CBT for psychosis can result in health benefits that persist for longer than a year, there is a relative scarcity of research evaluating the economic impact of such clinical gains. Whilst the studies of Kuipers et al. (1998), Startup et al. (2005) and Peters et al. (2010) suggest the addition of CBT to standard care results in no additional cost, the results of van der Gaag suggest that some level of monetary investment must be made in order to reap the benefits of the clinical gains. There are no studies to date which indicate a decrease in health related costs, following provision of CBTp. The current evaluation seeks to add to the current literature by providing data on the effect of CBTp on the cost of care in a specialist outpatient clinic.

2. Method

2.1 Participants

Seventy participants were selected for inclusion in the evaluation from a database of all patients who had received therapy in PICuP. Patients who had not consented to research were excluded. Although PICuP is a National Specialist service, only those patients within South London and Maudsley (SLaM) NHS Foundation Trust were included since only their electronic patient records were available for analysis. Patients who had received further therapy following completion of their initial therapy with PICuP were still included in the evaluation.

2.2 Measures

Given that the highest cost of care is inpatient stays and contacts with home treatment / crisis resolution services, the number of days registered with each of these services was used as an estimate of patient care cost prior to, during and following CBT therapy with the PICuP clinic.
The dependent variables were:

1. Number of days registered on a psychiatric inpatient ward
2. Number of days registered with a home treatment or crisis resolution team

These were combined to create an overall variable with the days spent under a high cost care team.
The independent variable was time period, which had three levels:

1. One year prior to an accepted referral
2. During therapy and before discharge
3. One year following discharge, or until the follow up assessment was completed

The duration of these time periods varied for each patient, so the number of days registered with an inpatient ward or home treatment team was divided by the number of months in each time period. In this way a value of number of days per month was calculated for both inpatient stays and crisis resolution/home treatment contacts. These figures were then multiplied by the cost of care per day for inpatient treatment (£312) and crisis resolution/home treatment team (£103) to give cost per month. Cost data were sourced from Curtis (2011).

2.3 Procedure

Participants who had declined the opportunity to take part in research were excluded from the initial sample of patients to be included in the evaluation. All remaining patients held on the PICuP master database were sorted by date of initial assessment in order to exclude participants who had not completed therapy plus a follow up period of a year. Participants who had received their initial assessment at least one and a half years prior to the time of data collection were therefore included. This resulted in patients who had completed their initial assessment in the time period from 02 August 2006 to 01 December 2009 being included in evaluation.

The Electronic Patient Journey System (EPJS; SLaM's electronic patient records system) was used to search for individual patient records. The first data to be extracted from these records were the three key assessment dates: initial assessment date, second assessment date (undertaken upon allocation to a therapist) and end of therapy assessment date. In approximately half the cases these dates were available from the PICuP master database; in cases where a date was missing, EPJS was used to ascertain the date. If patients had not been discharged from PICuP at least one year prior to the date of the search, they were excluded from the data on the basis that they had not had a long enough follow up period. In addition, if a patient had not completed a minimum of five therapy sessions, they were excluded from the main dataset as they were considered to have dropped out of therapy. Number of days under high cost care teams was collected for those who dropped out, for the time period prior to therapy, in order to ascertain whether those who did not engage in therapy differed in their service use prior to initial assessment for PICuP therapy.

Lastly, for each of the remaining patients, referral/movement data from EPJS were used to ascertain the number of days under the care of any psychiatric inpatient ward. This number was then entered into the appropriate reference period: one year prior to therapy, during therapy or, during the follow up period after discharge from PICuP. This same method was used to ascertain the number of days under the care of a home treatment / crisis resolution team.

Once all patient data were collated, the number of days on an inpatient ward was divided by the total number of months for the reference period. As an example, if a patient was in therapy for six months and within that time had 12 days on an inpatient ward, the number of days per month would be 2 (12 days / 6 months = 2days/month). This provided a consistent unit of measurement across participants, since the reference time periods varied.

The unit of analysis was total cost of care per month. This was calculated by working out the number of days contact with inpatient or home treatment team for each participant per month and multiplying this figure by the cost of each service.

3. Results

Following placing patients in order of initial assessment date, 183 patients were assessed for eligibility and exclusion criteria in order gain a sample size of 70 patients. Figure one indicates the number of patients excluded by reason for exclusion.

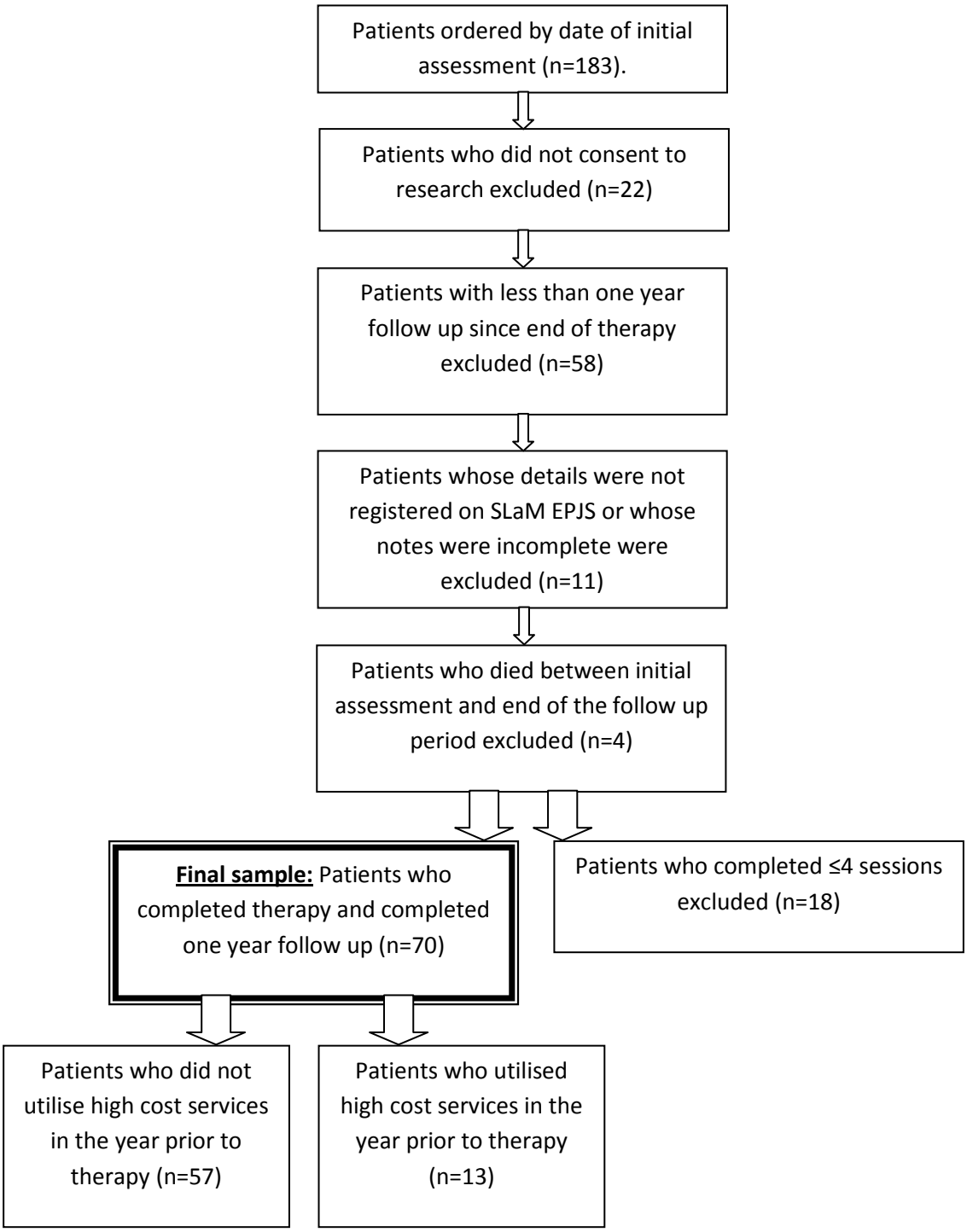

Figure 1. Patient flow diagram indicating number of patients included in analysis and number of patients excluded, sorted by reason for exclusion.

The total cost of care per month for the participant group as a whole decreased from £31,602.19 per month in the 12 month period prior to contact with PICuP to £15,159.48 during therapy. This decreased further to £12,056.62 in the 12 month period following cessation of therapy (see figure 2.). However, there were no statistical difference in cost over time, [Friedman statistic: X^2 *(2, n=70) = 4.48, p = n.s.].*

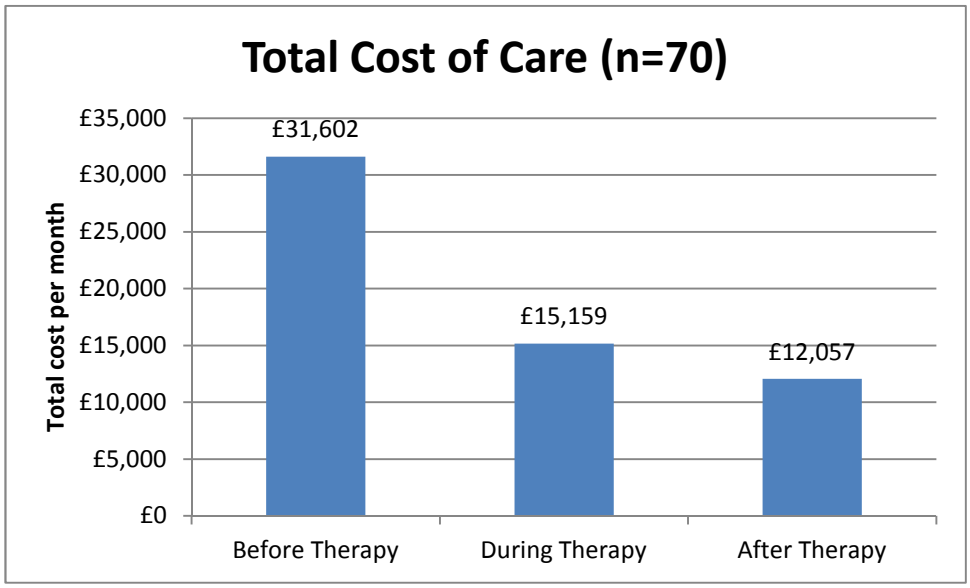

Figure 2. The total cost of care per month for 70 participants, as a function of time period (prior to therapy, during therapy and in the twelve months following therapy).

The total cost of care was £0 for at least 75% of patients across all three time points (see figure 3). This may account for the lack of significance in the cost of care across time, despite a seemingly large decrease in overall cost. It is notable that the range of care costs decreased (see figure 3) from the period prior to therapy (£7,793.60) to the period following therapy (£4,964.91) and that the number of participants with £0 of care costs increased from 62/70 to 67/70.

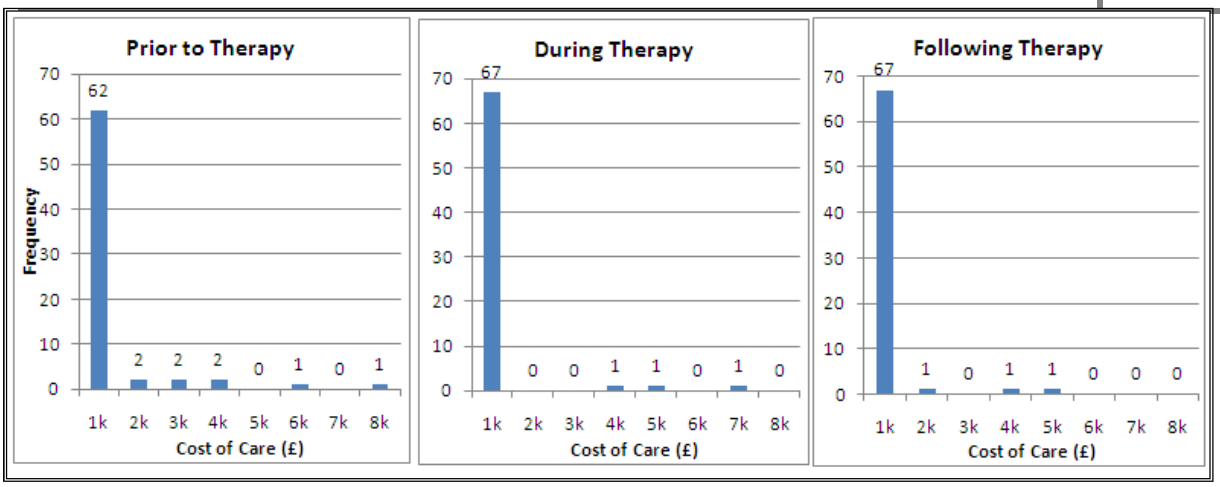

Figure 3. The number of patients incurring costs across the three reference periods (prior to therapy, during therapy and following therapy).

Given that most patients incurred no costs, sub-group analysis was carried out in order to analyse cost data for just those participants who had utilised high cost services (inpatient and home treatment/crisis resolution services) prior to therapy. The aim was to investigate whether therapy in PICuP decreased the use of high cost services in those who were prone to use costly care packages beforehand.

Sub-group analysis revealed that those who had contact with inpatient and home treatment team services in the year prior to initial assessment at the PICuP clinic significantly reduced their use of these high cost services during therapy (wilcoxon signed rank: *z = -1.99, n=13, p <.05)*. The use of these services also decreased from the period prior to therapy to the 12-month follow-up period after cessation of therapy, *(z =-2.62, n=13, p <.01).* The median cost in the twelve months prior to therapy was £1870, and this fell to £0 both during therapy and in the twelve months following therapy. There was no significant difference between the cost of care during therapy and in the 12 months following therapy, *(z = -.365, n=13, p = n.s.)*. This indicates that the relapse prevention gains made in therapy are maintained twelve months post-therapy.

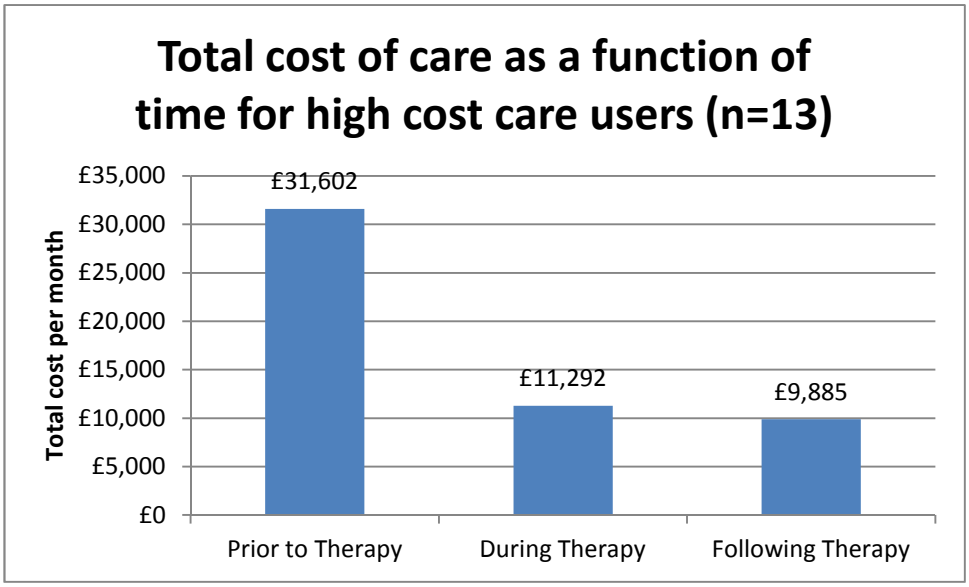

Figure 4. Total cost of care as a function of time period (prior to therapy, during therapy and in the twelve months following therapy) in those using high cost care prior to entering therapy.

When looking at individual costs from these 13 patients, all incurred costs related to inpatient and home treatment or crisis resolution team use prior to therapy. During therapy, this fell to 3/13 patients requiring these high cost services. In the year post-therapy, these three patients were still incurring costs related to high cost services and there was also one additional patient who had stopped using high cost services during therapy, but resumed use of these services within one year post-therapy (totalling 4/13). This suggests that the overall number of patients requiring high cost services prior to therapy dropped after therapy, from 13 to 4. Analysis of the trajectory of costs for individual cases shows that 10/13 of these patients show a decrease in their service costs over the time period from one year prior to therapy, to the follow up assessment after therapy (see figure 5).

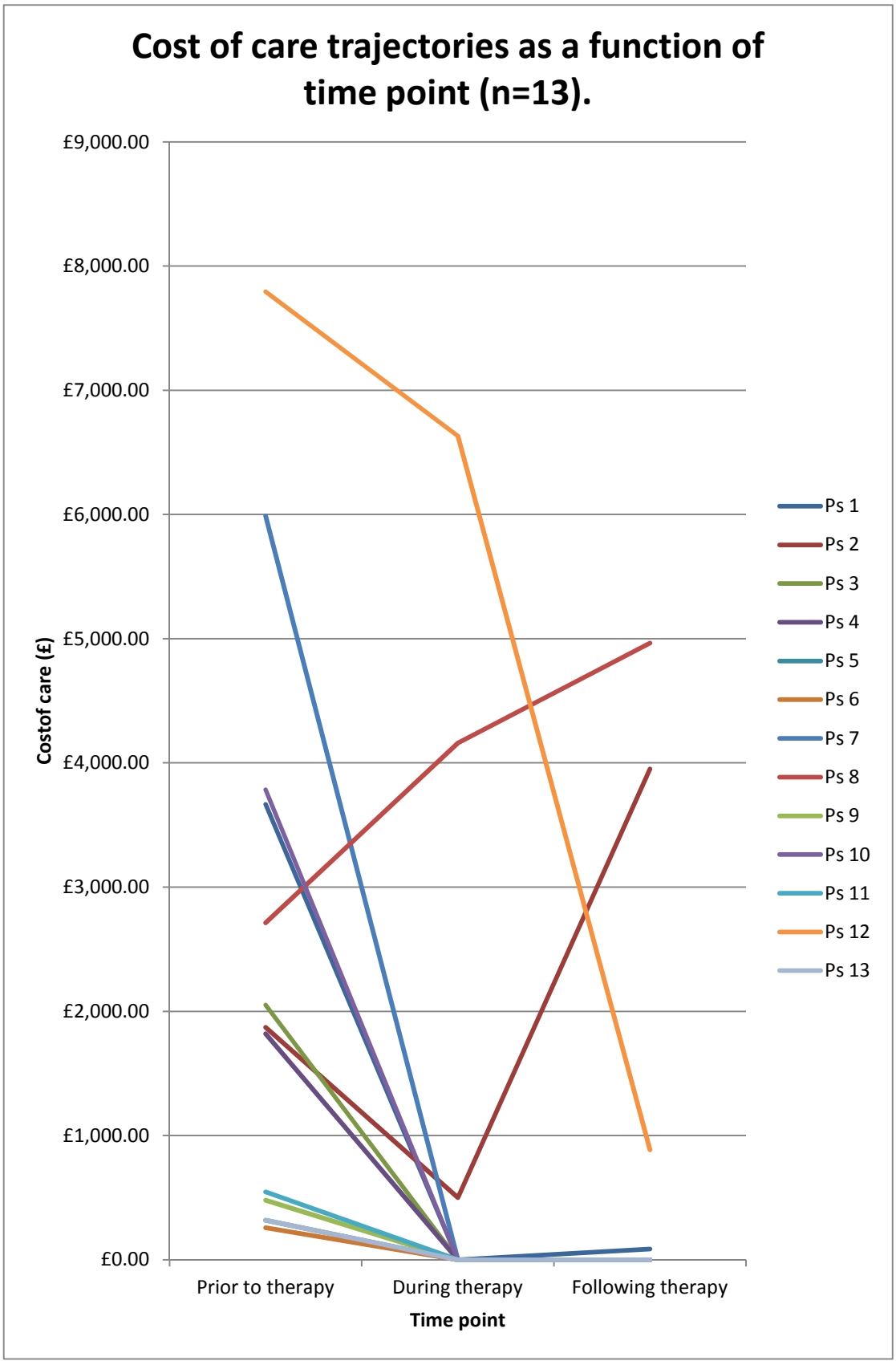

Figure 5. Cost of care trajectories plotted individually for 13 patients who utilised high cost care services prior to CBTp

The cost of therapy was calculated for the 13 participants who were high cost care users prior to therapy (see table 1). These costs were offset against the savings made through decreased use of inpatient and home treatment/crisis resolution services. The mean number of PICuP therapy sessions completed was 20, which equated to a mean cost of £2692.85. When the cost of therapy was offset against the savings made by decreased use of high cost care, the reduced costs were no longer present. Rather, to achieve a decreased use of inpatient and home treatment/crisis resolution services, a mean investment of £1022.33 was required (see table 1). Only 4/13 patients maintained their cost saving when the cost of CBTp was offset against cost savings made by decreased use of other services (see table 1).

Table 1. Offsetting the costs saved from reduced inpatient and home treatment/crisis resolution team use against the costs incurred through provision of CBTp.

	Offsetting the Cost of Therapy for patients who were high cost service users prior to therapy (n=13)				
	Total costs in year prior to therapy (£)	Total costs in follow up period (after therapy) (£)	Cost Saving (pre-therapy minus post-therapy costs) (£)	Total Cost of PICUP Therapy (£)	**Cost Saving** (cost saving minus cost of therapy) (£)
	3,665.20	86.33	3,578.87	1,920.00	1,658.87**
	1,870.67	3,950.38	-2,079.71	2,432.00	-4,511.71
	2,051.05	0.00	2,051.05	1,152.00	899.05**
	1,819.60	0.00	1,819.60	4,224.00	-2,404.40
	317.51	0.00	317.51	2,432.00	-2,114.49
	257.44	0.00	257.44	1,920.00	-1,662.56
	5,988.28	0.00	5,988.28	3,200.00	2,788.28**
	2,712.89	4,964.91	-2,252.02	768.00	-3,020.02
	479.25	0.00	479.25	5,985.00	-5,505.75
	3,784.80	0.00	3,784.80	4,446.00	-661.20
	544.39	0.00	544.39	1,792.00	-1,247.61
	7,793.60	883.81	6,909.79	2,688.00	4,221.79**
	317.51	0.00	317.51	2,048.00	-1,730.49
Mean:	2,430.94	760.42	1,670.52	2,692.85	-1,022.33

****Patient maintained their cost saving when the cost of CBTp was offset against cost saving made by decreased use of other services**

The cost of care from inpatient and home treatment/crisis resolution services prior to therapy was compared with the cost of care following therapy. The cost of care following therapy included the cost of inpatient and home treatment/crisis resolution costs but also included the additional cost of provision of CBTp from PICuP. There was no difference in the total cost of care following therapy, despite the added cost of CBTp from PICuP (wilcoxon signed rank: *Z = -1.36, n=13, p = .17).*

Service use data were collected for patients who completed an initial assessment for PICuP therapy, but did not complete at least five sessions of CBTp. Eighteen patients fell into this category. Four of the 18 patients utilised inpatient or home treatment / crisis resolution services in the year prior to their initial assessment (22.2%). This compares with 13 of the 70 patients who completed therapy (18.57%). Those utilising high cost services prior to assessment for PICuP therapy were equally distributed between those who did and did not engage in PICuP therapy, (X^2 *(1, n=88) = .12, p = n.s.).* This indicates that participants who did and did not engage in therapy were similar with regards to use of intensive services in the year prior to initial assessment with PICuP.

4. Discussion

The current evaluation suggests that, for the whole sample, Cognitive Behavioural Therapy (CBT) had no significant impact on the use of intensive care services during and after therapy compared with a year before therapy. Although the overall cost of care fell during and following CBT with PICuP (due to fewer days using these intensive services), the difference was not statistically significant. However, this finding should be considered in light of the large number of patients who used no intensive services at any time point.

When the analysis was restricted to only those clients who used these high cost services prior to entering therapy, their cost of care did significantly decrease following therapy within the PICuP clinic. Plotting the individual cost trajectory of these 13 participants indicated that 10/13 showed a decrease in their service costs from one year prior to therapy to 12 months following cessation of therapy. This was not an artefact of patients dropping out of therapy; those who dropped out did not differ on the number of high cost care days prior to entering therapy. The decreased use of intensive services in the year following therapy suggests that this group are not relapsing to a point where they require services such as inpatient or home treatment / crisis resolution. One likely cause

for this reduced risk of relapse is receipt of therapy in the PICuP clinic. Although this was not a controlled study, leaving open the possibility that factors other than therapy may have caused this reduction in service costs, it is nevertheless an exciting result.

The decreased cost of care for this sub-sample of high cost services users was no longer significant when the cost of therapy was offset against the cost savings. A mean investment of £1022.33 was required in order to achieve reduced use of high cost services in the period following therapy. Critically, this investment did not significantly raise care costs beyond what they were in the year prior to therapy. This suggests a shift in direction of funding; rather than funds being invested in inpatient and home treatment/crisis resolution care as they were prior to therapy, they are invested in CBTp with PICuP for a limited time period. Three previous studies have found a similar result; that despite the added cost of a CBTp intervention, the overall cost of care was no higher than standard care alone (Kuipers et al., 1998, Startup et al., 2005, Peters et al., 2010). Furthermore, the lack of increased cost in these three studies occurred in the context of significant clinical gains that were maintained at 3 months (Peters et al. 2010), 18 months (Kuipers et al., 1998) and two years (Startup et al., 2005) post CBTp. An extension of the current evaluation might consider lengthening the follow up period beyond that of one year in order to consider whether reduced costs from inpatient and home treatment/crisis resolution are maintained, without further investment in therapy.

The full NICE guidelines (NCCMH, 2010) report results from a meta-analysis of 31 randomised controlled trials of CBT for psychosis versus any type of control. This review found consistent evidence that, when compared with standard care, CBT was effective in reducing rates of rehospitalisation up to 18 months following the end of treatment. In addition, there was robust evidence indicating that the duration of hospitalisation was also reduced by an average of 8.26 days. This reduction is consistent with the data from the PICuP clinic evaluation, which found reduced intensive service use (inpatient and home treatment/crisis team) following therapy for those participants who used these services prior to entering therapy.

It is noteworthy to consider the patients who fell into the sub-group for further analysis. These were all patients who had utilised inpatient and/or crisis/home treatment team support within the 12 months prior to contact with PICuP. In this regard they might be considered to be less recovered from an acute episode than the participants who did not require this same level of support, and it is possible that these participants were not in the stable phase of the illness. Indeed four of the

thirteen patients who formed this sub-group received inpatient/home treatment support either during their time in therapy, or whilst on the waiting list for therapy.

One study which has explored the effect of CBTp in those who have recently experienced an episode of psychosis, rather than being in the stable phase of the illness, is that of Garety et al. (2008). This study was an RCT of CBT for psychotic patients who had recently relapsed. The sample was more comparable to the sample in the current sub-group analysis as they had experienced a second or subsequent episode of psychosis no more than three months before entering the trial. Initial results indicated that high quality CBT had no effects on rates of remission and relapse or on days in hospital at 12 or 24 months. However further detailed analysis revealed that engagement in active CBTp techniques (as opposed to engagement and assessment only) was associated with increased months in remission and decreased psychotic and affective symptoms (Dunn et al. 2011). The current evaluation of patients at PICuP had a smaller sample size, did not assess level of engagement in therapy, nor utilise a treatment as usual comparison group and is therefore not as methodologically robust. Nevertheless it is a promising result to find that patients can decrease their use of intensive and high cost care services following an acute episode of psychosis when offered CBTp through specialist NHS care.

This evaluation benefited from being an independent and retrospective evaluation, set in a specialist CBT for psychosis care setting. In this way, the therapy delivered and the results collected were in no way influenced by the fact that the evaluation was taking place. In addition they may be regarded as a good reflection of standard care from this specialised CBT for psychosis clinic. Because of the retrospective nature of the evaluation, patients at PICuP could be followed for a long time period; one year prior to therapy, during therapy, as well as one year following therapy. The long duration with which the patients were followed allowed enough time for fluctuation in functioning, which is realistic for a relapsing condition such as psychosis. It would be interesting to follow those who were high cost service users prior to entering therapy further into the future: although the cost of their care reduced over a 12 month period, it would be interesting to revisit this group in the future to evaluate whether their journey to recovery continued.

There are a number of limitations to the evaluation. First, current service use costs were used. In fact, given that a patient may have used inpatient services one year prior to contact with PICuP and then engaged in therapy for six months and had a twelve month follow up period, the cost of their

inpatient stay may have been calculated based on figures that are at least one financial year out of date. This of course must be balanced with resource limitations; to calculate the exact service cost for each participant based on the exact time period that they were utilising services would have been unfeasible.

The second limitation of note is the method of estimating cost data for each patient. Home Treatment Services for example, are usually billed on a 'per contact' basis rather than per day. This means that in real terms, the cost per day will vary based on the amount of telephone calls and face to face contacts a patient receives. For the purpose of the current evaluation it was decided that allowing an estimate of cost per day would allow data to be collected for more patients. Therefore although the cost data might be more accurate using number of contacts, the number of patients whose data could have been analysed to this level would have been reduced. An additional cost consideration is that of those patients who had an inpatient stay, it is possible that some were offered absence leave. If this is the case, the bed day may not have been billed to that patient but instead considered an unused bed. It was not possible to discern this level of information from the patient records, therefore absence days from inpatient stays was not included in analysis. This method was however consistent across all time points (before therapy, during therapy and after therapy) and therefore should not have biased the results in a meaningful way.

The data for the full set of 70 participants were skewed across all three time periods. This level of skew is normal in most health service cost data where resource consumption is low for the majority (Kilian et al., 2002). However, a further evaluation might consider an alternative way of collecting cost data. Given that over 75% of participants did not utilise any high cost services, it is worth considering whether this is the best measure for evaluating costs in this cohort. A future study might consider cost data from all levels of service intensity. It is for example possible that some patients in the current evaluation reduced their care needs from Community Mental Health Team back to Primary Care. Although this would constitute a decrease in health care costs, this type of change was not captured in the current evaluation due to the focus on the most costly care settings.

Further to this, a future evaluation might consider extending the concept of cost effectiveness beyond NHS intensive care provision. It may for example be beneficial to consider the number of patients who were engaging in employment, the number of patients who were discharged from Community Mental Health Teams back to Primary Care, or the number of patients whose carers are

engaging in employment rather than fulfilling a caring role. Indeed although employment data were not available for the current patient group, given that Kirkbride et al. (2011) suggest 47% of the total cost of schizophrenia is attributable to lost employment, this would seem a valid measure to be used in future cost evaluations.

5. Implications for health service practice

The current evaluation suggests that patients who have recently relapsed, but who receive CBT, decrease in their use of high cost care services. Given that at least 75% of the patients who were included in the current evaluation had no inpatient stays or home treatment costs, it seems that those who have recently had an acute phase of psychosis are in the minority of people being referred. This is a helpful result to feedback to Primary Care Trusts, individual referrers and tertiary referral panels. When deciding on whom to refer for CBT, they could consider those who have recently relapsed, but who feel able to engage in regular therapy sessions.

The current evaluation found that intensive service costs (from inpatient and home treatment / crisis resolution days) for the participant group as a whole decreased from the period prior to therapy to during therapy and then further decreased in the 12 month period following cessation of therapy, although not to the extent to be statistically significant. This lack of significant difference is likely due to the majority of patients who did not use these intensive services at any time point, causing the data to be skewed. In order to further aid economic evaluation of CBT for psychosis, it is recommended that the PICuP clinic collect data regarding employment status and whether a patient has been discharged to their GP, both before and after therapy. These variables might offer a more meaningful measure of cost outcome following therapy, for the type of referrals currently received by PICuP.

References

Curtis, L. (2011*). Unit costs of health and social care 2011*. Kent: Personal Social Services Research Unit.

Dunn, G., Fowler, D., Rollinson, R., Freeman, D., Kuipers, E., Smith, B., Steel, C., Onwumere, J., Jolley, S., Garety, P. & Bebbington, P. (2011). Effective elements of cognitive behaviour therapy for psychosis: results of a novel type of subgroup analysis based on principal stratification. *Psychological Medicine*, 42, pp 1057-1068 doi: 10. 1017/S0033291711001954

Fowler, D., Garety, P. & Kuipers, E. (1995). *Cognitive behavioural therapy for psychosis: theory and practice*. Chichester: Wiley.

Garety, P.A., Fowler, D.G., Freeman, D., Bebbington, P., Dunn, G. & Kuipers, E. (2008). Cognitive-behavioural therapy and family intervention for relapse prevention and symptom reduction in psychosis: randomised controlled trial. *The British Journal of Psychiatry*, 192: 412-423.

Jones C., Cormac, I., Silveira da Mota Neto, JI. & Campbell, C. (2010). Cognitive behaviour therapy for schizophrenia (Review). *The Cochrane Library, 2010,* issue 1: Wiley & sons.

Killian, R., Matschinger, H., Loffler, W., Roick, C., Angermeyer, M.C. (2002). A comparison of methods to handle skew distributed cost variables in the analysis of the resource consumption in schizophrenia treatment. *The Journal of Mental Health Policy and Economics,* 5: 21-31.

Kirkbride, J.B., Errazuriz, A., Croudace, T.J., Morgan, C., Jackson, D., McCrone, P., Murray, R.M. & Jones, P.B. (2011). *Systematic review of the incidence and prevalence of schizophrenia and other psychoses in England.* Department of Health Policy Research Programme.

Kuipers, E., Fowler, D., Garety, P., Chisholm, D., Freeman, D., Dunn, G., Bebbington, P., Hadley, C. (1998). London-east Anglia randomised controlled trial of cognitive-behavioural therapy for psychosis. III: Follow-up and economic evaluation at 18 months. *The British Journal of Psychiatry*, 173: 61-68.

Miles, H., Peters, E.R. & Kuipers, E. (2007). Service-user satisfaction with CBT for psychosis. *Behavioural & Cognitive Psychotherapy*, 35: 109-117.

NCCMH (2010) *Schizophrenia: Core Interventions in the Treatment and Management of Schizophrenia in Adults in Primary and Secondary Care.* Updated edition. Leicester and London: The British Psychological Society and the Royal College of Psychiatrists. [Full guideline]

NICE (2009) *Schizophrenia: Core Interventions in the Treatment and Management of Schizophrenia in Adults in Primary and Secondary Care.* NICE clinical guideline 82. Available at www.nice.org.uk/CG82 [NICE guideline]

Peters, E., Landau, S., McCrone, P., Cooke, M., Fisher, P., Steel, C., Evans, R., Carswell, K., Dawson, K., Williams, S., Howard, A. & Kuipers, E. (2010). A randomised controlled trial of cognitive behaviour therapy for psychosis in a routine clinical service. *Acta Psychiatrica Scandinavica*, 122: 302-318.

Startup, M., Jackson, M.C., Evans, K.E. & Bendix, S. (2005). North Wales randomized controlled trial of cognitive behavioural therapy for acute schizophrenia spectrum disorders: two-year follow-up and economic evaluation. *Psychological Medicine*, 35: 1307-1316.

van der Gaag, M., Stant, D.A., Wolters, K.J.K, Buskens, E. & Wiersma, D. (2011). Cognitive-behavioural therapy for persistent and recurrent psychosis in people with schizophrenia-spectrum disorder: cost-effectiveness analysis. *The British Journal of Psychiatry*, 198:59-65.

Zimmermann, G., Favrod, J., Trieu, V.H. & Pomini, (2005). The effect of cognitive behavioural treatment on the positive symptoms of schizophrenia spectrum disorders: a meta-analysis. *Schizophrenia Research*, 77: 1-9.