

# **Insomnia in a prison population: A mixed methods study**

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by

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## List of abbreviations

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<b>ACCT</b>	Assessment, Care, Custody and Teamwork
<b>AIS</b>	Athens Insomnia Scale
<b>AIE</b>	attention-intention-effort
<b>AvPD</b>	avoidant personality disorder
<b>BME</b>	black and minority ethnicities
<b>BAME</b>	Black, Asian and minority ethnic
<b>BPI</b>	beck depression inventory
<b>BNF</b>	British National Formulary
<b>BPRS</b>	Brief Psychiatric Rating Scale
<b>BPD</b>	borderline personality disorder
<b>BSI</b>	brief symptom inventory
<b>C</b>	control group
<b>CBT</b>	cognitive behavioural therapy
<b>CBTi</b>	cognitive behavioural therapy for insomnia
<b>CHIPS</b>	cohen-hobernab inventory of physical symptoms
<b>CI</b>	confidence interval
<b>CIS-R</b>	clinical interview schedule
<b>COPD</b>	chronic obstructive pulmonary disease
<b>DBAS-16</b>	Dysfunctional Beliefs and Attitudes about Sleep
<b>DDHNS</b>	Disturbance Due to Hospital Noise Scale
<b>DPD</b>	dependent personality disorder
<b>DSM</b>	Diagnostic and Statistical Manual of Mental Disorders
<b>EEG</b>	electroencephalography
<b>EOG</b>	electrooculography
<b>ESS</b>	Epworth Sleepiness Scale
<b>GAS</b>	global assessment scale
<b>GBSS</b>	great British sleep survey
<b>GHQ</b>	general health questionnaire
<b>GP</b>	general practitioner
<b>GRADE</b>	Grading of Recommendations, Assessment, Development and Evaluations
<b>GSII</b>	Glasgow sleep impact index
<b>GS</b>	good sleepers
<b>HARP</b>	Health and Recovery Peer Program
<b>HDRS</b>	Hamilton depression rating scale
<b>HMPS</b>	Her Majesty's Prison Service
<b>IAPT</b>	improving access to psychological therapies
<b>ICD</b>	International Classification of Diseases
<b>ICPC</b>	International Classification of Primary Care



<b>ICPS</b>	international centre for prison studies
<b>ICSD</b>	International Classification of Sleep Disorders
<b>ID</b>	insomnia disorder
<b>IIS</b>	Hoelscher's Insomnia Impact Scale
<b>ISQ</b>	Insomnia Symptom Questionnaire
<b>ISI</b>	insomnia severity index
<b>LSEQ</b>	Leeds sleep evaluation questionnaire
<b>MOSS-SS</b>	medical outcomes Study Sleep Scale
<b>MINI</b>	Mini-International neuropsychiatric Interview
<b>NHS</b>	National Health Service
<b>NICE</b>	National Institute for Health and Care Excellence
<b>NPT</b>	nocturnal penile tumescence
<b>NSM</b>	non-substance misusing
<b>NSMI</b>	non-substance misusers with insomnia
<b>NSMNI</b>	non-substance misusers without insomnia
<b>PLMS</b>	periodic limb movements of sleep
<b>PAI</b>	personality assessment index
<b>PD</b>	personality disorder
<b>PESQ</b>	prison environment sleep questionnaire
<b>PSG</b>	polysomnography
<b>PR</b>	progressive relaxation
<b>PRSC</b>	progressive relaxation/stimulus control
<b>PSIQ</b>	psychology services inmate questionnaire
<b>PSQI</b>	Pittsburgh sleep quality index
<b>RCGP</b>	Royal College of General Practitioners
<b>RCSQ</b>	Richard Campbell's sleep questionnaire
<b>RCT</b>	randomised controlled trial
<b>RDC-1</b>	research diagnostic criteria
<b>REC</b>	research ethics committee
<b>REM</b>	rapid eye movement
<b>RLS</b>	restless legs syndrome
<b>RPS</b>	Royal Pharmaceutical Society
<b>SADS-C</b>	schedule of affective disorders and schizophrenia-change version
<b>SBS</b>	the sleep beliefs scale
<b>SCI</b>	sleep condition indicator
<b>SCID-V</b>	Structured Clinical Interview for DSM-V
<b>SCS</b>	sleep complaints scale
<b>SDQ</b>	sleep disorders questionnaire
<b>SDS</b>	sleep disorders screener
<b>SD</b>	Standard deviation
<b>SF-36</b>	Short Form Health Survey of Medical Outcomes Study

<b>SHAPS</b>	sleep hygiene awareness and practice scale
<b>SHI</b>	sleep hygiene index
<b>SPAQ</b>	sleep practices and attitudes questionnaire
<b>SPD</b>	schizotypal personality disorder
<b>SPQ</b>	sleep problems questionnaire
<b>SMI</b>	substance misusers with insomnia
<b>SMNI</b>	substance misusers without insomnia
<b>SRT</b>	sleep restriction therapy
<b>TIB</b>	limiting time in bed
<b>TM</b>	transcendental mediation
<b>UK</b>	United Kingdom
<b>USA and US</b>	United States of America

## Abstract

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### **The University of Manchester**

**Name:** Lindsay Helen Dewa

**Degree title:** Doctor of Philosophy (PhD)

**Thesis title:** Insomnia management in a prison population: a mixed methods study

**Date of submission:** 27<sup>th</sup> September 2016

**Background:** Around a third of the general population experience insomnia at some point in their lives. A lack of good quality sleep can negatively impact upon daytime functioning, relationships and behaviour. Although the issues and management of prisoner's mental health has been assessed thoroughly across the prison literature, the importance of poor sleep prevalence, associated causes and its management has failed to be systematically examined. My systematic integrative review of the sleep-prison literature collated and synthesized the evidence, informing the overall study objectives and design.

**Aim:** The overarching aim of this mixed-methods thesis was to produce a treatment pathway to help manage insomnia in a prison population, acceptable to both staff and prisoners.

**Study 1:** A national survey and telephone interviews examining current insomnia management practice in England and Wales prisons. Eight-four prisons took part (73%). The most common interventions were medication and sleep hygiene education. Analysis of telephone interviews revealed four main themes, insomnia as a normal occurrence in prison; the problem of medication in prison; the negative impact of the prison environment; and effective management of insomnia in prison.

**Study 2:** A cross-sectional study looking at prevalence and associated factors of insomnia in male and female prisons was conducted. Two hundred and thirty seven prisoners completed a questionnaire battery. Around two-thirds had insomnia disorder and clinical, environmental and situational factors were much more likely in this group than those without insomnia.

**Study 3:** Semi-structured interviews were conducted with staff and prisoners to explore perspectives of insomnia management. Three themes were found: value of good sleep, barriers and considerations for good sleep management and future direction of insomnia management in prison.

**Study 4:** A modified Delphi consensus study was conducted with academic sleep researchers, prison staff and service users over three rounds of consultation. Consensus was achieved and a stepped-care treatment pathway was produced.

**Conclusion:** When used in future practice, the treatment pathway should help practitioners to identify, assess and manage insomnia in a population that is twice as likely to experience insomnia as the general population.

## Declaration

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No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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## The Author

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Lindsay Dewa graduated from the University of Liverpool in 2005 with an undergraduate degree in Psychology and Criminology. Following this Lindsay was recruited by Liverpool John Moores University where she spent the next five years working as a public health researcher. During this time she completed two masters degrees at UCLAN: one in Forensic Psychology and the other in Psychological Research Methods. After her time at LJMU she moved to The University of Manchester to take up a research post in forensic mental health research. It was there she started her PhD in Medicine. At the time of PhD submission Lindsay had secured a research associate position in patient safety and mental health at NIHR Patient Safety Translational Research Centre, Imperial College London.

## Presentations associated with this thesis

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**Dewa LH**, Hassan L, Shaw J, Senior J. Trouble sleeping inside: the prevalence and associated risk factors of insomnia in prison populations in England (poster).

Presented at: SLEEP 2016, June 2016. Denver, CO, US

**Dewa LH**, Hassan L, Shaw J, Senior J. Insomnia Management in Prisons in England and Wales: A Mixed Methods Study (oral).

Presented at: International Association of Forensic Mental Health Services (IAFMHS), New York, NY, US.

**Dewa LH**. Effectively managing sleep disorders in prison (oral).

Presented at: Primary Care and Public Health (invited speaker). May 2016. Birmingham, UK.

**Dewa LH**, Hassan L, Shaw J, Senior J. The current practice of insomnia management in prison populations (poster).

Presented at: British Sleep Society, November 2015. Newcastle, UK.

**Dewa LH**. Insomnia management in a prison population: a pilot intervention (poster).

Presented at: Sleep Medicine and Circadian Neuroscience Summer School, Nuffield Department of Clinical Neurosciences. August 2015. University of Oxford, UK.

**Dewa LH**, Hassan L, Shaw J, Senior J. Trouble Sleeping Inside: The prevalence and associated factors of insomnia in English prisons (oral).

Presented at: International Association of Forensic Mental Health Services (IAFMHS). June 2015. Manchester, UK.

**Dewa LH**, Hassan L, Shaw J, Senior J. Trouble Sleeping Inside: The prevalence and associated factors of insomnia in English prisons (poster).

Presented at: The 8th International Youth Workshop "Sleep: a window to the world of wakefulness". May 2015. St Petersburg, Russia.

**Dewa LH** Prison Research: Prevalence, aetiology and management of insomnia in prisons (invited speaker).

Presented at: Specialised Services Directorate Meeting, Bridgewater Community Healthcare NHS Trust. November 2014. Warrington, UK.

**Dewa L.H**, Kyle S.D, Hassan L, Shaw J, Senior J. Prevalence, associated factors and management of insomnia in prison populations: an integrative review (poster)

Presented at: European Sleep Research Society. September 2014. Tallinn, Estonia.

**Dewa LH**. The management of insomnia in a prison population: a pilot intervention (poster).

Presented at PsyPAG. June 2013. Lancaster University, UK.

**Dewa LH**. The management of insomnia in a prison population: a pilot intervention (oral)

Presented at: SPARC. May 2013. University of Salford.

## Chapter 1 Introduction

---

This thesis is presented in alternative format, with a number of sections written in the form of stand-alone academic papers.

Chapter two provides a review of the current literature concerning the definition of insomnia and its diagnosis, prevalence, aetiology, consequences and treatment in non-custodial settings. This is followed by an overview of the prison population, health issues in prison and, specifically, a systematic integrative review of the literature concerning insomnia in prisons:

**Paper 1:** Dewa, L., Kyle, S., Hassan, L., Shaw, J., & Senior, J. (2015). Prevalence, associated factors and management of insomnia in prison populations: An integrative review. *Sleep Medicine Reviews*, 24, 13–27.  
10.1016/j.smr.2014.12.002

Chapter three examines the overarching research paradigm guiding this multi-faceted study, discussing the rationale for the different methodologies adopted. The specific methodologies relevant to each discrete aspect of the study are presented in separate results chapters that cover (i) current insomnia management practices in prisons in England and Wales; (ii) prevalence rates and associated factors of insomnia in prison; (iii) a qualitative study of staff and prisoner perspectives on insomnia management and (iv) a suggested treatment pathway for insomnia in prison. Where necessary, additional methodology detail is covered in the appendix.

Chapters four to eight comprise results papers for the four parts of the study:

**Paper 2 (study 1):** Dewa, L., Hassan, L., Shaw, J., & Senior, J. (2017). Insomnia Management in Prisons in England and Wales: A Mixed Methods Study. *Journal of Sleep Research*.

**Paper 3 (study 2):** Dewa, L., Hassan, L., Shaw, J., & Senior, J. (2017). Trouble sleeping inside: a cross-sectional study of the prevalence and associated risk factors of insomnia in adult prison populations in England. *Sleep Medicine*, 32: 126-136.



**Paper 4 (study 3):** Dewa, L., Hassan, L., Shaw, J., & Senior, J. (2017). Crossed wires? Prisoner-patient and staff perceptions on insomnia treatment: a qualitative study. *Manuscript in Preparation.*

**Paper 5 (study 4):** Dewa, L., Hassan, L., Shaw, J., & Senior, J. (2017). The design of a treatment pathway for insomnia in prison: a modified Delphi study. *Manuscript in Preparation.*

The final chapter comprises a unifying discussion of all findings, examining the work's strengths and limitations, its policy and clinical implications and the future direction of research.

## Chapter 2 Background

---

*“The worst thing in the world is to try to sleep and not to”*

~ F. Scott Fitzgerald

### 2.1 Defining and diagnosing insomnia

There is no universally accepted definition of insomnia (Morin & Benca, 2012), with criteria differing across diagnostic sleep manuals and the wider literature. There is widespread consensus that insomnia can be either a discrete disorder, or a symptom of another illness (Buysse, 2008).

The manner in which it may be defined as a symptom can vary greatly. Importantly, insomnia is routinely defined either using a general (Klink, Quan, Kaltenborn, & Lebowitz, 1992; Quera-Salva, Orluc, Goldenberg, & Guilleminault, 1991) or stringent methodology (American Academy of Sleep Medicine, 2014; American Psychiatric Association, 2013; Ohayon, 1997; World Health Organization, 1992). For example, a general definition of insomnia can refer to a perception of short or light sleep or general sleep dissatisfaction (Ohayon & Reynolds, 2009). In contrast, a stringent definition delineates specific criteria to be met, such as limits to duration, frequency and severity of sleep problems and the impact upon daily functioning. The three most commonly used sleep manuals, which require the stringent criteria to be met for diagnosis are the *International Classification of Sleep Disorders* (ICSD-3; American Academy of Sleep Medicine, 2014), the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-V; American Psychiatric Association, 2013) and the *International Classification of Diseases* (ICD-10; World Health Organization, 1992).

#### 2.1.1 Diagnostic criteria

Five diagnostic criteria are common across each sleep manual, albeit with variations in interpretation. These are (i) *duration* (e.g. acute, subacute and chronic; (Ellis, Gehrman, Espie, Riemann, & Perlis, 2012; Ellis, Perlis, Neale, Espie, & Bastien, 2012); (ii) *frequency*; (iii) *type* (i.e. primary and secondary); (iv) *severity* (e.g. mild, moderate and severe) and (v) *presence of poor daily functioning* (Morin & Benca, 2012). For example, the criterion of duration of symptoms features in all three manuals but varies in terms of the length of time required for diagnosis (see table 1). Similarly, only the ICSD-3 differentiates between short-term and long-term insomnia. In all systems, insomnia must be present for at least three nights per week to meet the frequency criterion.

All three diagnostic manuals require the presence of negative daytime consequences, suggesting this criterion is integral for an accurate diagnosis of insomnia. Furthermore,

all diagnostic definitions consider the presence of a trigger to the insomnia, for example bereavement. Although the assigned cause might not be included in, or necessary for, the diagnosis of insomnia, addressing it might be necessary for successful treatment.

### 2.1.2 *Definitions using diagnostic criteria*

Definition by duration of symptoms is commonly used in the sleep literature (Morin, 2012). Duration can be split between short-term (acute) and long-term (chronic), lasting over 3 months (Ellis, Gehrman, et al., 2012). Recently, short-term insomnia has been highlighted as a distinct subtype, very different to long-term insomnia, requiring a different treatment approach (Ellis, Gehrman, et al., 2012).

Previously, insomnia was widely accepted as either primary or secondary. *Primary insomnia* was diagnosed when there was no identifiable cause for the condition (Riemann & Voderholzer, 2003); for example, it was not due to substance misuse, mental disorder or another sleep disorder (Edinger et al., 2004). In contrast, *secondary insomnia* is related to another disorder, such as depression or generalised anxiety disorder (Ohayon, 2002). Primary insomnia was most likely assigned as a discrete insomnia *disorder* whereas secondary insomnia was not assigned as a separate disorder because it was linked to another condition.

More recently, due to the complex, bidirectional, relationship between insomnia and other conditions, the distinction between primary and secondary insomnia was eliminated across both DSM and ICSD diagnostic manuals (Morin et al., 2015) leading to consolidation into the single diagnosis of *Insomnia Disorder*<sup>1</sup> (ID; DSM-V; American Psychiatric Association, 2013). According to the DSM-V, to be diagnosed with ID the following features need to be present: difficulty initiating or maintaining sleep and early morning awakening with the inability to return to sleep for at least three nights per week and for more than three months (American Psychiatric Association, 2013) (see Table 1). Insomnia must also impact on daytime functioning and occur despite having the opportunity to sleep. This current classification of ID therefore no longer categorises insomnia under separate diagnostic labels (e.g. primary, secondary, chronic, acute, comorbid etc.) as previously, preferring a holistic definition that suggests insomnia should be treated as a distinct disorder. That is, even when coupled with other conditions there should be a separate diagnosis of insomnia.

### 2.1.3 *Natural history of insomnia*

To date, few studies have looked at the natural trajectory of insomnia over time (Ellis, Perlis, Bastien, Gardani, & Espie, 2014; Ellis, Perlis, et al., 2012; LeBlanc, Merette,

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<sup>1</sup> ICSD-3 differentiates between *chronic* insomnia disorder and *short-term* insomnia disorder

Savard, & Ivers, 2009; Morin et al. 2005). Morin and colleagues studied 388 Canadian participants with baseline insomnia (61% women; mean age 44.8 [ $\pm$ 13.9] years) over a 3-year period. They reported 74% had insomnia at 1-year follow-up and almost half (46%) continued to have symptoms 3 years after baseline. Exact reasons why insomnia persisted were unknown, however a common trajectory showed that those with insomnia symptoms developed insomnia syndrome (i.e. severe insomnia). Whilst the study demonstrated the persistence of insomnia in many patients, the study did not examine factors relating to the transition from acute to chronic insomnia.

Ellis' research group has focused on understanding the natural history of acute insomnia (Ellis et al., 2014; Ellis, Perlis, et al., 2012). In the earlier study, individuals from the general population in the US (n=2861) and UK (n=1507) were examined at one month and three month follow-ups. Results showed modest prevalence rates in UK and US (7.9% and 9.5% respectively), with 21.4% transitioning from acute to chronic insomnia. This was taken further in the 2014 study, examining the natural history of acute insomnia and the onset of depression in UK. A polysomnography (PSG; i.e. physiological recording of multiple considerations of awake and rest activity) was conducted on 54 participants (n=33 with acute insomnia and n=21 'good sleepers' at baseline). PSG findings showed that, at three months follow-up, those with acute insomnia had increased non-REM 2 (light sleep) and decreased non-REM stage 3 (deeper sleep). Additionally, 9.3% those who had developed chronic insomnia also developed depression. Despite these early findings showing the natural history of insomnia, further work is needed with large samples, to fully delineate the trajectory in groups with comorbid conditions.

Table 1: Insomnia definition by criteria and diagnostic manual

Criteria	Description	Diagnostic manual		
		ICSD-3	DSM-V	ICD-10
<b>Disorder name</b>	<i>Diagnoses</i>	Insomnia disorder Short-term Other insomnia disorder	Insomnia disorder	Insomnia (organic)
<b>Symptom</b>	<i>Symptoms can include: problems initiating and/or maintaining sleep, non- restorative sleep and early morning awakening</i>	- Difficulty initiating sleep - Difficulty maintaining sleep - Early morning awakening without intention - Resistance to going to bed on appropriate schedule - Difficulty sleeping without parent or caregiver intervention	- Difficulty initiating sleep - Difficulty maintaining sleep - Early morning awakening and unable to go back to sleep	- Difficulty falling asleep - Maintaining sleep - Non-refreshing sleep
<b>Duration</b>	<i>Short-term: - Acute (&lt;3 months) - Chronic (≥3 months)</i>	- Short-term insomnia disorder: <b>&lt;3 months</b> - Chronic insomnia disorder: <b>≥3 months</b> - Other insomnia disorder:	Insomnia disorder: <b>≥3 months</b>	<b>&gt;1 month</b>
<b>Frequency</b>	<i>Weekly, monthly</i>	Chronic insomnia disorder: <b>≥3 nights per week</b> Short-term insomnia: N/A	<b>≥3 nights per week</b>	
<b>Consequences</b>	<i>Negative affect on daytime functioning, interpersonal relationships, concentration etc.</i>	Daytime impairment must be affected by the insomnia itself		

<b>No attributable cause</b>	<i>Not due to substance misuse and psychiatric or medical conditions</i>	N/A	<ul style="list-style-type: none"> <li>- The insomnia is not attributable to substance misuse</li> <li>- Comorbid conditions do not adequately explain the principal insomnia complaint</li> </ul>	<ul style="list-style-type: none"> <li>- Nonexistence of causative organic factor (e.g. neurological condition, psychoactive substance disorder or medication)</li> </ul>
<b>Miscellaneous</b>		<ul style="list-style-type: none"> <li>- Complaint cannot be explained by inadequate opportunity (enough time to sleep) or circumstances (e.g. environment is dark, safe, quiet and comfortable)</li> <li>- - Is not better explained by another sleep disorder</li> </ul>	<ul style="list-style-type: none"> <li>- Complaint occurs despite adequate opportunities to sleep</li> <li>- Is not better explained by another sleep disorder (e.g. sleep apnea, narcolepsy, parasomnia etc.)</li> </ul>	

#### 2.1.4 *Models of insomnia*

There is no one universally accepted explanation of how chronic insomnia develops; however, several evidence-based models are supported across the academic community, particularly because of their relevance to insomnia treatment. Some of these models are briefly described (Table 2) and critically appraised: they are the stimulus control model, 3-P model, cognitive model, hyperarousal model of insomnia and the attention-intention-effort pathway (Bootzin, 1973; Espie, Broomfield, MacMahon, Macphee, & Taylor, 2006; Harvey, 2002; Riemann et al., 2010; Spielman & Glovinsky, 1991). Although not a model, considering substance misuse within the context of insomnia development is crucial and is also discussed.

##### 2.1.4.1 Stimulus control model

The stimulus control model was one of the earliest attempts to explain the development of insomnia (Bootzin, 1973). The behavioural model is based on traditional conditioning principles. For example, the behavioural response to an event (stimulus) can be changed by learning (conditioning) (Perlis, Smith, & Pigeon, 2017). Therefore, sleep is a conditioned response to environmental stimuli. The model thus suggests that good sleepers are conditioned to associate the bedroom environment with the initiation of sleep whereas individuals with insomnia have altered conditioning and cues for sleep such as the bed, bedroom environment and bedroom routine become associated with wakefulness. Usual behaviours that would seem helpful to combating initial sleep difficulties (e.g. staying in bed longer than usual, going to bed early, participating in activities in bed other than trying to sleep etc.) are performed; however, such behaviours instigate stimulus dyscontrol because the bedroom is no longer associated with sleep. Moreover, the stimuli usually associated with sleep will suppress sleepiness and instead promote wakefulness. Stimulus control therapy, based on the model, is one of the most recognised and widely used non-pharmacological interventions for insomnia. This may be because of strong evidence of its effectiveness (Morin, Culbert, & Schwartz, 1994). Despite this, there are some limitations. The main limitation is that stimulus dyscontrol alone is not enough to explain the development of insomnia as a predisposing, precipitating or perpetuating factor (Perlis et al., 2017). Additionally, it is not a comprehensive model that can easily explain the multifaceted chronic insomnia.

##### 2.1.4.2 The 3P model

As previously discussed (pages 19-20), knowledge regarding the natural evolution of insomnia is still in its infancy compared to that of other mental and physical conditions. Early work by Spielman and colleagues projected insomnia across time and accounted for the different stages (Spielman & Glovinsky, 1991). Figure 1 projects insomnia over

time, showing each factor, which contributes to each stage of insomnia. Predisposing factors exist throughout the entire course of insomnia. For example, some people have increased vulnerability to sleep problems by virtue of being female, sensitivity to anxiety or having hyperarousal<sup>2</sup>. Precipitating factors do not necessarily make someone vulnerable to insomnia; rather, they can trigger poor sleep, which may then lead to insomnia; common examples include stressful life events such as bereavement, divorce and redundancy. People with chronic, persistent, insomnia often are initially vulnerable to developing the condition and then experience a stressful event. Most people return to normal patterns of sleep after such events; however, for some, perpetuating factors maintain the problem. For example, changes in psychological and behaviour may exacerbate symptoms, including associating the bedroom with difficulties getting to sleep, developing dysfunctional beliefs about sleep (e.g. excessive worry about next day consequences) and taking daytime naps.

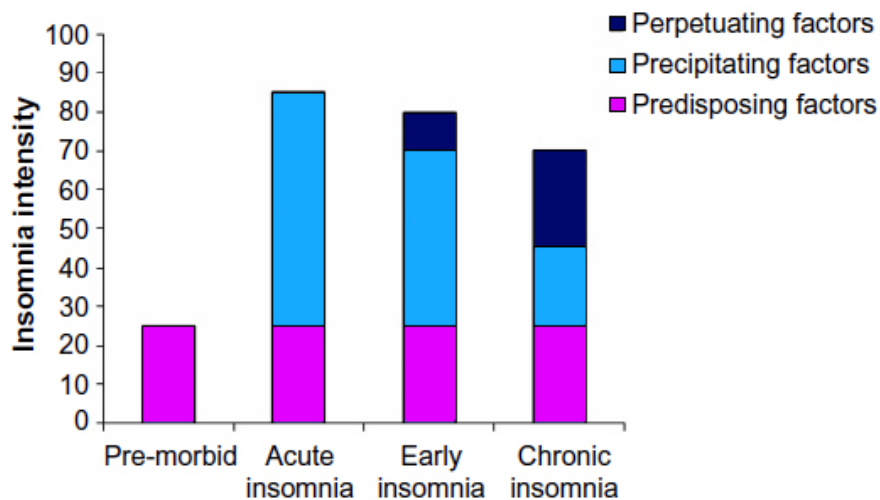


Figure 1: Spielman and Glovinsky 3P model.

Taken from Spielman, A. J. & Glovinsky, P. (1991). The varied nature of insomnia. In P. J. Hauri (Ed.), *Case studies in insomnia* (pp. 1–15). New York: Plenum Press. Included with permission from Springer Publishing.

#### 2.1.4.3 The cognitive model

The cognitive model of insomnia originally aimed to explain the maintenance of insomnia by highlighting the involvement of cognitive processes on insomnia (Harvey, 2002). The main model concept proposes that excessive daytime and night-time worry or rumination about not sleeping leads to initial distress and arousal. This results in selective attention and monitoring and more sleep-related worry and arousal which in turn lead to a misperception of sleep and daytime deficit (Figure 2). This continuous interconnected cycle constantly interferes with sleep onset and sleep maintenance that

<sup>2</sup> State of amplified psychological or physiological tension



perpetuate insomnia (Harvey, 2002; Perlis et al., 2017). Dysfunctional beliefs about sleep and counterproductive safety behaviours (e.g. behaviour adopted because of fear of not sleeping) exacerbate the excessive negatively toned cognitive activity (Figure 2). Dysfunctional beliefs about sleep can include “needing 8 hours sleep or I will not be able to function”, whilst counterproductive safety behaviours, can include drinking coffee or napping. Measures have been developed that are relevant to discrete components of the cognitive model, such as:

- rumination (Daytime Insomnia Symptom Response scale and Glasgow Content of Thoughts Inventory; Carney et al., 2013; Harvey & Espie, 2004);
- beliefs (Dysfunctional Beliefs and Attitudes about Sleep Scale, DBAS; Morin et al., 2007);
- arousal and distress (Pre-Sleep Arousal Scale, PSAS; Nicassio et al., 1985);
- safety behaviours (Sleep Related Behaviours Questionnaire, SRBQ; Ree & Harvey, 2004) and,
- worry, rumination and beliefs (Glasgow Sleep Effort Scale, GSES; Broomfield & Espie, 2005).

All measures are reliable, valid and widely used to guide non-pharmacological treatment for insomnia (Broomfield & Espie, 2005; Hiller, Johnston, Dohnt, Lovato, & Gradisar, 2015; Morin et al., 2007). The model has extensive support but there are a few limitations. Unlike the Spielman’s 3P model (Spielman & Glovinsky, 1991), described earlier, the cognitive model does not specifically acknowledge predisposing factors such as emotional reactivity or precipitating stressors (e.g. life events, accident) which may contribute to insomnia. In addition, the model does not sufficiently explain specific thought patterns that may initially lead to or arise from the development of insomnia (Buysse, Germain, Hall, Monk & Nofzinger, 2012). The cognitive model goes a long way to explain the development of insomnia through our cognitive processes; however the part of the brain that underlies the insomnia is not explained.

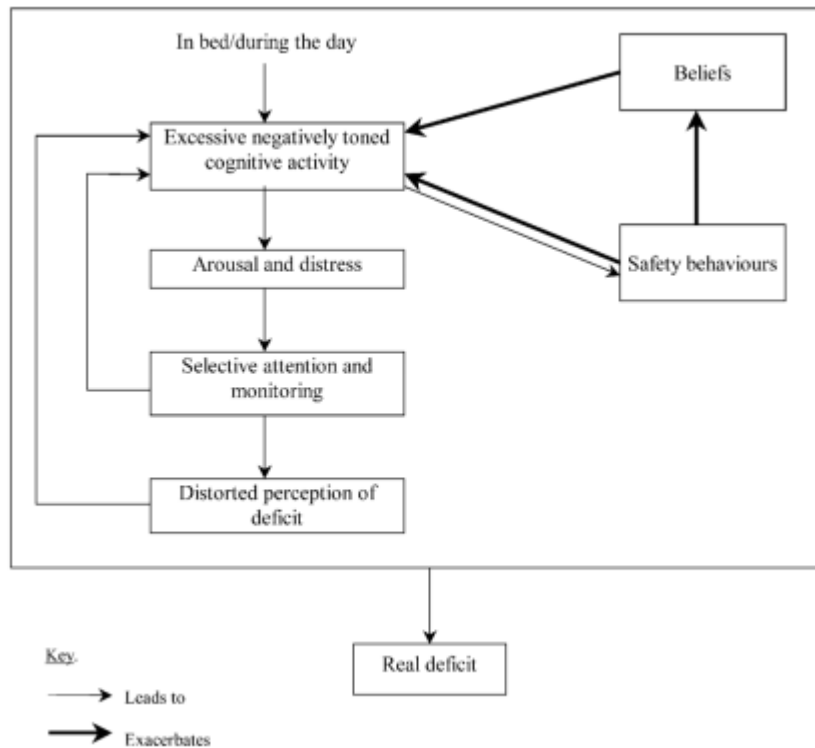


Figure 2: Cognitive model of insomnia (Harvey, 2002). Included with permission.

#### 2.1.4.4 Hyperarousal model

The hyperarousal model centres on how physiological arousal drives wakefulness and therefore individuals experiencing insomnia are too aroused to initiate or maintain sleep (Riemann et al., 2010). This arousal leads to maladaptive sleep behaviours and subsequently chronic insomnia (Riemann et al., 2010). Individuals that are aroused demonstrate a vulnerability to environmental factors including noise, which may explain why some people are disturbed by environmental stimuli and others are not affected. The model has many strengths. Notably, all types of studies, including autonomous, neuroendocrine, neuroimmunological, electrophysiological and neuroimaging research have found arousal to be linked to insomnia (Riemann et al., 2010), demonstrating widespread support for the hyperarousal concept and model. Furthermore, the model has extensive support from many objective PSG and electroencephalography (EEG) studies and, in particular, there is strong evidence of the role of cortisol in insomnia (e.g. Perlis, Smith, Andrews, Orff, & Giles, 2001). For example, patients with insomnia have higher cortisol levels when compared to good sleepers.

The main limitation of the model is that the hyperarousal model fails to adequately account for the transition from good sleeping to acute insomnia (Perlis, Shaw, Cano & Espie, 2011). The 3P model does account for the transition (pages 23-24). Therefore, longitudinal studies are needed to investigate the hyperarousal model application on the transition from good sleeper, acute and then chronic insomnia cycle.

#### 2.1.4.5 The attention-intention-effort pathway

The previous three models centre on the inability to initiate or maintain sleep. In contrast, the attention-intention-effort pathway (A-I-E) proposes the opposite viewpoint, focusing on the inability to inhibit wakefulness. The pathway originates from the psychobiological inhibition model of insomnia (Espie, 2002), positioned in the idea that sleep is a normal and automatic process that is ensured by plasticity<sup>3</sup>. The A-I-E extends the psychobiological inhibition model by outlining processes that interfere with the natural sleep cycle. Espie and colleagues suggest sleeping is automatic but can be inhibited by our attempt to control the sleep process (Espie et al., 2006). This controlling process can be defined as comprising three main interrelating stages: selective attention, intention to sleep and effort to sleep. Firstly, people with insomnia give sleep exaggerated attention and are distracted with reoccurring thoughts that they can't sleep. This is called sleep-related attentional bias (Harris et al., 2015). Secondly, by explicitly intending to sleep, a person with insomnia becomes aroused and purposively behaves in a way they think will help improve their sleep. Their behaviour is modified, but instead of improving sleep, it impairs it. Lastly, sleep effort is an extension of 'intention to sleep' as it focuses on related processes such as "trying to get to sleep" or going for a nap, or going to bed earlier. Good sleepers would not need to "try" to go to sleep; it would just happen. Insomnia is therefore a conscious cognitive delineation where behaviours inhibit rather than promote sleep.

Like the cognitive model, the A-I-E pathway has support from the use of assessment measures like the GSES in research and treatment where the assessments are useful general measures of sleep psychology (Broomfield & Espie, 2005). However its key strength is the weight of clinical and experimental evidence supporting the association between attention bias and mental illness, including anxiety disorders, post-traumatic stress disorder and insomnia (Espie et al., 2006; Harris et al., 2015; Perlis et al., 2011). For example, an anxious person will be preoccupied with potential danger and therefore intentionally responds to the danger they perceive to be threatening. Likewise a person with insomnia is preoccupied with getting to sleep. Furthermore, computerised information-processing tests such as the emotional Stroop task have become useful tools to test the operation of the A-I-E pathway in practice because of their objective nature (Harris et al., 2015). The pathway may also explain the effectiveness of cognitive behavioural therapy for insomnia (CBTi) components (see 45-47). This is because CBTi specifically attempts to modify the attentional, intentional and effortful processes to result in good sleep (Perlis et al., 2017). However, the A-I-E pathway, whilst supported in the literature has been mainly tested and examined largely in the UK. Therefore, it

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<sup>3</sup> The ability to adjust to situations where the normal sleep-wake functioning can be disrupted

needs further validation across varied participant groups worldwide because other populations may differ.

#### 2.1.4.6 Substance misuse issues

The previous models attempt to explain the development of chronic insomnia. An overview of substance misuse as a risk factor for insomnia is detailed later in Chapter 2; however, acknowledging persistent substance misuse here as a contributory factor in the development of insomnia and circadian disruption is important, particularly because substance misuse issues may impact upon choice and efficacy of treatment. For example, as sleep disturbance may be worse during active withdrawal for substance misusing patients, non-pharmacological interventions may be more appropriate than hypnotics (Hasler, Smith, Cousins & Bootzin, 2012). A *pathway* of sleep and circadian rhythms in relation to substance misuse centres on the issue of addiction and how the emotional consequences result in sleep disturbance. The resultant misalignment in the sleep-wake cycle results in hypersensitive nature to the reward of substance consumption (Hasler et al., 2012). Subsequent sleep disturbance could lead to more substance consumption in an attempt to resolve the sleep problem; a complex bidirectional relationship is therefore apparent (Roth, 2009). Substance misuse can therefore be a precipitating factor for insomnia in some people, which depending on the chronicity of use, could engender long-term changes in sleep neurobiology and psychology and by extension act as a perpetuating factor.

In contrast to the other explanations of chronic insomnia, the substance misuse-sleep pathway has no known associated measures that make it viable. It is likely that individuals who present with substance misuse issues will also have sleep problems and therefore relevant measures from the other models may be used. However, treatments suitable for individuals that have this comorbidity are evident. Notably, non-pharmacological interventions such as stimulus control and light therapy could help patients with insomnia and substance misuse problems (Hasler et al., 2012). Light therapy uses bright lights at certain times of the day to impact upon circadian functioning. Stimulus control therapy aims to reduce conditioned arousal related to bed time routine. More detail is covered later in the chapter (see 2.3.2.2 and 2.5.1).

Table 2: Key cognitive, behavioural and neurocognitive models of insomnia

Model	Perspective	Central idea	Other key model ideas	Stage of insomnia	Arousal	3P model factors
<b>Stimulus control (Bootzin, 1973)</b>	Behavioural	Sleep related cues such as the bed become negatively paired with wakefulness	Behavioural response to a stimulus can be changed by conditioning	Sleep-onset and sleep maintenance	Conditioned negative arousal of sleep related cues leads to sleep difficulty	Perpetuating
<b>3P model (Spielman &amp; Glovinsky, 1991)</b>	Behavioural	Three types of factors interaction results in insomnia	How acute insomnia becomes chronic insomnia	Sleep-onset and sleep maintenance	Hyperarousal can be a predisposing factor	Predisposing, precipitating and perpetuating
<b>Cognitive Model (Harvey et al. 2002)</b>	Cognitive	Pathology of sleep.	Considers both daytime and night-time deficits.	Sleep maintenance	Autonomic cognitive arousal in relation to anxiety, rumination and worry about not sleeping keeps person awake.	Perpetuating
		Dysfunctional cognitive processes cause insomnia.	Dysfunctional beliefs about sleep and safety behaviours			
<b>Hyperarousal model (Riemann et al., 2010)</b>	Neurocognitive	Pathology of sleep.	Explains vulnerability to environmental factors such as noise	Sleep-onset and sleep maintenance	Somatic, cognitive and cortical activation perpetuates insomnia	Predisposing, precipitating and perpetuating
		Conditioned arousal drives wakefulness				
<b>Attention-Intention Effort Pathway (Espie et al., 2006)</b>	Cognitive	Inability to achieve wakefulness.	Selective attention to sleep, intention to sleep and effort to sleep are	Normal sleep	Arousal interacts with the normal sleep-wake regulation	Precipitating and perpetuating

		Centralised on normal sleep as an automatic process.	stages that inhibit good sleep			
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#### 2.1.4.7 Model summary

In summary, each model has its strengths and weaknesses and provides an evidence-based understanding of the development of chronic insomnia. Substantial steps have been taken to further our understanding of the sleep-wake cycle and the development of insomnia where each may target different treatment goals. A holistic model that incorporates all factors is yet to be found; however, it is possible that each model runs parallel to each other which delineates separate systems of insomnia with the exception of the substance misuse pathway where it will clearly only be evident in individuals with substance misuse issues.

#### 2.1.5 Summary

Understanding how individuals transition from being a good sleeper to developing acute, and then chronic, insomnia is relevant to informing how insomnia should be managed. Throughout this thesis, the term “insomnia” will refer to the DSM-V definition of insomnia disorder (American Psychiatric Association, 2013). This definition was chosen, as it is holistic and includes all aspects of insomnia, without reference to specific type or duration.

## 2.2 Epidemiology of insomnia

In both research and in clinical practice, insomnia complaints are usually followed by deeper investigation into any precipitating factors and the consequences of insomnia. The challenge in identifying causes of insomnia is made more difficult by the interchangeable and circular nature of factors classified as causes and risks (Ohayon & Roth, 2003). For example, whilst depression can precipitate the development of insomnia, insomnia is also a diagnostic criterion of depression.

This section examines the prevalence and aetiology of insomnia including demographic issues, lifestyle factors (e.g. socio-economic factors and substance misuse), internal factors including psychological aspects (e.g. depression, suicidality and stress) and physical health problems (e.g. chronic pain). It then looks at external factors such as general environmental factors, for example noise and light, and features of particular institutional settings. Finally, the consequences of insomnia, including social and cognitive functioning, are examined.

### 2.2.1 Prevalence

Around a third of the general population worldwide have symptoms of insomnia at some point in their lifetime (Morin et al., 2015). However, how insomnia is defined impacts upon prevalence rate estimates. Reported rates in research are affected by the use of different measures (e.g. measures specific to insomnia, dichotomous simple questions etc.); the type of insomnia recorded (acute or chronic); the use of general or stringent criteria; and the demographic characteristics of the populations surveyed, for example men or women, young or old, those in institutions and those with or without other health problems.

It is logical that, the more stringent the definition applied, the lower the prevalence rate will be. A cross-sectional study of 25,579 men and women from the general population of seven countries, including the UK, compared the prevalence of insomnia complaints with set operational definitions from diagnostic manuals (i.e. DSM-IV-TR; Ohayon & Reynolds, 2009). Results showed that 37% of participants identified insomnia complaints but this reduced to just 7% when stringent diagnostic definitions were used. Similarly, a large two-country study (n=4,368; 28% and 72% of the sample drawn from the UK and US respectively) reported the prevalence of acute insomnia (i.e. symptoms present between three days and three months, for at least three nights per week, had a trigger and established insomnia severity) was less than 10% in both regions (Ellis, Perlis, et al., 2012).

Studies have shown higher rates of insomnia in people diagnosed with mental health conditions, potentially because of shared risk factors and biological features. For example, two recent studies, both conducted in UK mental health in-patient populations, found high prevalence rates of insomnia when using standardised sleep measures (Donaldson & Chintapanti, 2009; Haynes, Parthasarathy, Kersh & Bootzin, 2011). Haynes and colleagues



aimed to determine insomnia severity in a small group of psychiatric in-patients (n=76). Using the Insomnia Severity Index (ISI; Morin, 1993, see table 5), 57% had moderate to severe insomnia symptoms. Donaldson and Chintapanti investigated sleep quality in a sample of 46 psychiatric in-patients. Using a standardised sleep measure, the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989), see table 5), they reported that just over three quarters (78%) of their sample had poor sleep quality. These reported prevalence rates are much higher than the highest rates reported in any general population sample. It is to be noted, however, that both studies had relatively small sample sizes (76 and 46 respectively), suggesting the results may not necessarily be representative of UK mental health in-patients as a whole.

The wide-ranging prevalence rates reported across studies make it difficult to fully understand the extent of the problem and also impacts on considerations for the management of the condition (discussed later in *Chapter 2*). For example, the amount of money, resources and attention given to insomnia management is likely to be at least partially dependent upon how big of a problem it is perceived to be by a range of bodies, including government and the clinical and research communities.

## 2.2.2 Demographic factors

### 2.2.2.1 Gender differences

Differences have been reported in the prevalence of insomnia among men and women. Zhang & Wing (2006) produced a meta-analysis of 31 studies, which concluded insomnia was significantly more common among women than men. This has been a consistent finding across different countries (*US*: (Kripke, Garfinkel, Wingard, Klauber & Marler, 2002); 16.6% in women and 8.5% in men; *China*: (Li, Wing, Ho, & Fong, 2002); 14.0% and 9.3% respectively; *France*: (Leger, Guilleminault, Dreyfus, Delahaye & Paillard, 2000); 12.0% and 6.3% respectively). Nonetheless, exceptions have been noted. For example, one study examined the prevalence of insomnia in Norway by gender, physical problems and mental illness using a large cross sectional sample (n=47,700) (Sivertsen, Krokstad, Overland, & Mykletun, 2009). The results showed that insomnia was no more common in women than men, even after controlling for age and comorbidity (Sivertsen et al., 2009).

### 2.2.2.2 Age

Several studies have examined the relationship between age and sleep. Whilst some authors have found a significant linear relationship between age and rates of insomnia (e.g. Foley et al., 1995; Sleepio, 2012; Stewart et al., 2006), others have found no evidence of such a link (Ohayon & Smirne, 2002). One particularly large cross sectional study in Italy used telephone interviews to estimate the prevalence of insomnia disorders (DSM-IV-TR) in 3,970 people in the general population (Ohayon & Smirne, 2002). Results showed insomnia did not

consistently increase with age and that this was true across all types of insomnia diagnosis (i.e. primary insomnia or insomnia related to a medical disorder). In spite of this, aspects of the methodology can be criticised. Telephone interviews are not ideal when undertaking a general population survey as they are likely to sample from certain groups who are more probable to be at home when called, for example the unemployed and retired. Whilst the prevalence of insomnia in older people has been widely accepted, it is possible that any increase is due to a combination of both age and other (known and unknown) factors that are independently associated with insomnia.

### 2.2.3 *Socio-economic factors*

Risk of insomnia is greater in individuals with factors indicating poor socio-economic status (Elger & Sekera, 2009), including being separated or divorced, poorly educated or unemployed (Satiea & Nowell, 2004; Talala et al., 2012). In a large cross-sectional survey in Finland (n=70,115), questionnaires were administered to assess the relationship of insomnia and stress to economic status (Talala et al., 2012). The study reported insomnia was significantly more prevalent in individuals who were unemployed, had retired early or had lower education status; the latter was particularly evident in men. However, the authors did not adequately describe their operational definition of insomnia; had no control over how participants interpreted questions; nor use a standardised insomnia assessment tool, any or all of which may have affected results.

### 2.2.4 *Substance misuse*

Several studies have examined the relationship between drug and/or alcohol misuse and sleep disturbance (e.g. Babson, Boden, Harris, Stickle & Bonn-Miller, 2013; Mahfoud, Talih, Stroom & Budur, 2009; Morgan et al., 2006; Wallen, Lorman & Gosciniak, 2006). The relationship seems to be complex and multifaceted. Sleep problems act as a risk factor for relapse; some substances promote sleep; and some substances make sleep problems worse. One review of 107 papers concluded that between 25-72% of those experiencing alcohol dependence who enter treatment have insomnia (Stein & Friedmann, 2005). Similarly, those experiencing illicit substance withdrawal have significant sleep problems in the first few weeks of detoxification (Brower, Krentzman, & Robinson, 2011). In a cross-sectional study, Mahfoud and colleagues (2009) examined the association between sleep disturbances and substance misuse in 30 American adults. Questionnaire results showed 97% were considered poor sleepers (PSQI>5); 40% used substances to promote sleep and 56.6% had moderate-severe insomnia. Whilst these are promising results showing a possible relationship between substance misuse and insomnia, the small sample size suggests these results should be interpreted with caution.

An additional issue is in individuals who self-medicate in an effort to alleviate sleep problems. Whilst it is evident that insomnia can be a side effect of drug and alcohol withdrawal

(Department of Health, 2007), some people who struggle to sleep may use such substances specifically to relieve symptoms of insomnia. Extensive searching failed to find a systematic review or similar exploring the impact of illicit drug misuse on sleep, which is a notable gap in the literature. A critical review of the literature, studies with larger sample sizes and those that examine the various impacts of substance misuse on sleep and insomnia are needed to further elucidate the findings.

### 2.2.5 *Internal factors*

#### 2.2.5.1 Psychiatric disorder

Historically, a diagnosis of secondary insomnia, caused by another condition, was more likely to be due to a mental, rather than physical, disorder (Buysse et al., 1994). An estimated 40% of people with insomnia have a mental health problem (Roth, 2007) at any one time. Several studies have examined the association between mental health and sleep. Whilst some authors have not found a significant relationship between mental disorders and sleep quality (Doi et al., 2000), others have found strong evidence of such a link, particularly with insomnia (Gillespie et al., 2012; Taylor et al., 2005; Ohayon, 1997). In a relatively large study of 5,622 French participants, Ohayon (1997) examined the prevalence of secondary insomnia in those with a mental disorder, using DSM-IV criteria. Almost a fifth (18.6%) of the sample reported insomnia complaints and almost a tenth (8.4%) were diagnosed with insomnia related to a mental disorder. There are difficulties with this study, including use of interviews via telephone. Results are biased to people at home in the day and it is difficult to make a diagnosis over the telephone. Moreover, other confounders such as medical history were not adequately controlled for.

A more recent, longitudinal study, examined the relationship between alcohol dependency and the severity of both insomnia and depression, using the Sleep Problems Questionnaire (SPQ), Brief Symptom Inventory (BSI) and structured clinical interview (Zhabenko, Krentzman, Robinson & Brower, 2013). In 364 alcohol dependent men and women in the general US population, depression severity and quantity of alcohol use significantly predicted insomnia severity over a period of 2.5 years. These results possibly show people who are alcohol dependent and have depression are at risk of developing insomnia over time. However, Zhabenko and colleagues failed to include a diagnostic assessment of insomnia and did not measure/control for other sleep disorders, illicit drugs or prescribed medication, any of which could negatively impact upon sleep quality and insomnia severity.

The following sections will now describe the evidence in relation to specific psychiatric disorders.

#### 2.2.5.2 Depression and anxiety

The evidence of a relationship between insomnia and depression and/or anxiety is stronger than that for other mental health disorders (e.g. Baglioni, Spiegelhalder, Lombardo and Riemann, 2011; Gillespie et al., 2012; Ohayon, 1997; Taylor et al., 2005). In a retrospective, cross-sectional study, Taylor et al. (2005) examined the relationship between insomnia, depression and anxiety in a random sample of 772 American adults (50.6% women). Participants completed a questionnaire pack that covered demographic information, a sleep diary, daytime functioning and symptoms of anxiety and depression. After exclusions<sup>4</sup>, a refined sample of 534 participants was used to compare those with and without insomnia on a number of factors (19.7% and 50.4% respectively). Results showed that participants with insomnia were significantly more likely to have anxiety and depression than those who did not. Notably, Taylor and colleagues confirmed these results after controlling for factors such as age and gender.

In a more recent study, Baglioni et al. (2011) conducted a systematic review on the relationship between emotional reactivity (i.e. “threshold, peak intensity and the recovery time in response to emotional stimulation” p.228) and the insomnia-depression-anxiety triad. Seventy-two studies were included for examination. Overall, results showed that insomnia was associated with internalising problems (i.e. anxiety/depression) rather than externalising problems (i.e. verbal and physical aggression). Similarly, negative emotional states, including loneliness and hostility, were associated with poor sleep.

There is therefore an association between anxiety, depression and insomnia but it not clear whether anxiety and depression lead to insomnia, or whether insomnia is a trigger factor for either or both. Despite evidence from a small number of studies there is likely to be a bidirectional relationship between insomnia, anxiety and depression (Alvaro, Roberts & Harris, 2013). Moreover, it is also unclear whether insomnia is an integral symptom of depression and anxiety (i.e. no cause and effect), a disorder that occurs as a precipitating factor or as a result of these two conditions. Larger samples and studies that separate depression and anxiety as risk factors for insomnia are needed to further understand these complex relationships.

#### 2.2.5.3 Other psychological issues

Although not as common as depression and anxiety, other sleep (e.g. apnoea) and mental disorders (e.g. schizophrenia), and psychological issues such as stress and suicidality are associated with insomnia.

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<sup>4</sup> Exclusion criteria was extensive: no ethnicity mentioned, ethnic minorities, had another sleep disorder and those who met an insomnia diagnosis but who did not complain about insomnia

#### 2.2.5.3.1 Suicide

In 2013, there were 6,233 suicides in the UK (National Confidential Inquiry into Suicide and Homicide by People with Mental Illness, 2015). The strongest risk factors for suicide include a previous history of self-harm, suicide attempts and ideation; historic and current symptoms of mental illness, particularly depressive symptoms, hopelessness and alcohol misuse (Centre for Suicide Research, n.d.). Other predictive factors, albeit to a lesser extent, are physical ill health, unemployment, stressful events, persistent nightmares and insomnia (Norra, Richter, & Juckel, 2011). Recent research has given insomnia more prominence as a risk factor for suicide ideation, attempts and completed suicide (Bernert & Joiner, 2007; Bernert, Kim, Iwata, & Perlis, 2015; Bernert & Nadorff, 2015; Fujino, Mizoue, Tokui, & Yoshimura, 2005; Kay et al., 2016; Nadorff, Nazem, & Fiske, 2011; Rezaie, Khazaie, & Yazdani, 2016), particularly in depressed individuals (S. X. Li, Lam, Yu, Zhang, & Wing, 2010).

One particularly large longitudinal study ( $n=15,597$ ) in Japan examined the relationship between suicide completion and possible risk factors, including insomnia, using self-report questionnaires (Fujino et al., 2005) over 14 years. Questionnaires were matched to records post suicide. Results showed “problems with maintaining sleep” was the only insomnia related factor, which was a significant risk factor for suicide. Problems with onset insomnia, early final awakening and non-restorative sleep did not significantly predict suicide completion. However, the study presents multiple methodological issues. Insomnia was not assessed according to any diagnostic criteria, no standardised measure was utilised (see table 6) and depression was not measured. The latter is particularly important, as depression is a risk factor in suicide attempts and suicide completions (Dumais et al., 2005).

In contrast to Fujino et al.'s study, McCall and colleagues (2010) focused on insomnia as an independent predictor of suicidality (McCall et al., 2010). A clinical trial of 60 clinically depressed participants examined the possibility that insomnia could be an independent predictor of suicidality. Using the Insomnia Severity Checklist and Hamilton Depression Scale for Depression (HDSD), higher levels of insomnia severity were significantly related to suicidality, even when insomnia and depression were in a combined model. However, a limitation in the study is the small sample size, which could limit the representativeness of the results. In summary, despite small sample sizes, research indicates that there is a relationship between sleep problems and suicide.

#### 2.2.5.3.2 Stress

Stressful life events, such as interpersonal relationship problems, have been associated with depression and suicide (Mann et al., 2005) and can also anticipate insomnia (Basta, Chrousos, Vela-Bueno & Vgontzas, 2007; Bastien et al., 2004; Morin, 2003). Using three reliable, standardised measures (Coping Inventory for Stressful Situations; CISS; Endler and Parker, 1990; Perceived Stress Scale; PSS, Cohen, Karmack and Mermelstein, 1983, and

Life Experience Survey; LES, Sarason, Johnson & Siegel, 1978), LeBlanc et al. (2009) looked at potential risk factors for onset insomnia including the incidence of stressful events in the last year, in a sample of 494 Canadians from the general population. Based on these measures, participants were assigned to three different groups: good sleepers, “insomnia syndrome” (i.e. met an amalgamation of ICD-10 and DSM-IV-TR diagnostic criteria) and “insomnia symptoms” (i.e. various insomnia criteria without meeting all diagnostic criteria). Results showed that the group identified as “insomnia syndrome”, the most stringent category, had experienced more stressful life events than those who were good sleepers. This could indicate that stressful life events are a potential risk factor of insomnia. However, LeBlanc and colleagues only examined the incidence of events and not the response to each stressful event. Nevertheless, the study was comprehensive; indeed, it controlled for physical health, lifestyle factors, depression and anxiety when assessing insomnia incidence.

#### 2.2.5.4 Physical health problem

Another common cause of insomnia in the general population is poor physical health (Bastien et al., 2004). Many physical conditions are associated with insomnia symptoms including neurological issues e.g. chronic pain (Hester & Tang, 2008; LeBlanc et al., 2009; Palermo, Law, Churchill, & Walker, 2012; Sivertsen et al., 2009; Tang et al., 2015); stroke (Foley et al., 1999); headaches (Ong & Park, 2012); cardiovascular complaints e.g. hypertension (Fernandez-Mendoza et al., 2012) and heart failure (Hayes, Anstead, Ho & Phillips, 2009); and pulmonary disorders e.g. chronic obstructive pulmonary disease (COPD; George & Bayliff, 2003).

Chronic insomnia and sleep duration has also been linked to mortality (Gallicchio & Kalesan, 2009; Kripke et al., 2002; Kripke, Langer & Kline, 2012; Mallon, Broman & Hetta, 2000). For example, a systematic review and meta-analysis of 23 studies examined sleep duration and mortality. In 17 studies that were methodologically acceptable to include within the meta-analysis, there was a relative risk of 1.10 for short sleep duration and 1.23 for long sleep duration for all-cause mortality (10% and 20% increased risk respectively). Short and long sleepers were both found to be at increased risk of mortality. However, more studies are needed to give further verification to these findings.

The association between chronic pain and insomnia has recently received attention (Hester & Tang, 2008; LeBlanc et al., 2009; Palermo et al., 2012; Sivertsen et al., 2009; Tang et al., 2015; Zhang et al., 2012). Whilst some authors have found a significant relationship between pain and insomnia (Zhang et al., 2012), others found no evidence for such a link (Siversten et al., 2009). In a recent study, it was predicted that insomnia would be significantly associated with somatic conditions and pain (Zhang et al., 2012). Standardised measures of insomnia, somatic conditions and pain were administered on both adolescents with insomnia complaints and their parents from Hong Kong (n=259 and n=256 respectively). Zhang and colleagues

found that both groups of participants with insomnia rated higher on somatic and pain measures than their non-insomniac counterparts. In contrast, a large cross-sectional study (n=47,700) in Norway found no significant association between insomnia and somatic conditions (Sivertsen et al., 2009). However, this result was only present when controlling for other health covariates including chronic pain, anxiety and depression. As a result, any relationship between somatic conditions and insomnia remains unclear.

## 2.2.6 *External environmental factors*

### 2.2.6.1 Poor sleep environment

The physical environment and other external factors have been shown to negatively impact upon sleep. Bedroom-related factors including temperature (e.g. too hot/cold), noise (Hauri, 1991; Kageyama et al., 1997), light (Hauri, 1991) and inadequate bedroom setup (e.g. poor mattress quality; Morin & Espie, 2003) have all been demonstrated to reduce the quantity and quality of sleep. For example, sudden and unpredictable noises (e.g. a loud bang) or prolonged noises (e.g. a clock ticking or continuous chatter) can contribute to sleep disturbance and thus to the development of insomnia (Halperin, 2014).

Whilst it appears logical that noise could impact upon a person's sleep, both delaying sleep-onset and interrupting sleep, there is limited robust evidence for such an association, although the impact of noise on sleep is a public health concern (World Health Organization, 2009). Most recently, a descriptive article summarised the evidence, reporting nocturnal noise affects sleep architecture, resulting in being awake more and increased time in stage 1 sleep rather than natural time in slow wave and REM sleep; in short, noise generates a lighter sleep (Halperin, 2014). Moreover, several studies have indicated nocturnal noise negatively affects daytime functioning, increases sleepiness and contributes to poor sleep quality (Elmenhorst et al., 2010; Franssen, van Wiechen, Nagelkerke & Le Bret, 2004; Fyhri & Aasvang, 2010; Kageyama, Yano, Kuwano, Sueoka & Tachibana, 2016; Muzet, 2007). Nocturnal noise exposure also increases risk for physical conditions including hypertension, heart disease and stroke (de Souza, Périssé & Moura, 2015; Floud et al., 2013). However, most of the literature denotes the effects of road and aircraft noise on sleep, but nocturnal noise in the immediate bedroom and surrounding environment is also problematic (Gellerstedt, Medin & Karlsson, 2014; Lei et al., 2009; Park et al., 2014; Patel, Chipman, Carlin & Shade, 2008; Thomas et al., 2012; Xie, Kang & Mills, 2009).

Several studies have looked at the impact of noise in forced-contact environments' (i.e. having close proximity with other people and little control over the environmental factors, for example in a general or psychiatric hospital) such as hospitals (Park et al., 2014; Topf, 1985; Topf & Thompson, 2001). Most recently, Park and colleagues found the noise in wards were over double the recommended maximum of 30 decibels (dB) for avoiding negative effects on

sleep. Of the 103 patients included in the study, the majority (86%) experienced sleep disturbance directly related to hospital noise. An earlier study looked at the interaction between noise stress and poor sleep using a standardised measure (Topf & Thompson, 2001). In 97 patients, a hierarchical multiple regression found significant bed stress (unfamiliar bed) interacted with noise stress, creating poorer sleep. However, some people who experience noise and sleep disturbance will not develop insomnia, which suggests that some are less sensitive to noise than others (Lukas, 1975). Therefore, whilst residential factors may be important to consider when identifying precipitating factors of insomnia, they may be more likely to perpetuate existing, rather than be a primary cause of, insomnia symptoms (Morin, 1993).

### *2.2.7 Forced-contact closed environmental factors*

A forced-contact closed environment can negatively impact upon a person's sleep routine, quality and quantity (Collier, Skitt & Cutts, 2003; Donaldson & Chintapanti, 2009; Frighetto et al., 2004; Griffiths & Peerson, 2005; Haynes et al., 2011; McCall, Reboussin & Cohen, 2000). Studies in in-patient settings have found that insomnia is present, both when using specific and non-insomnia specific tools - such as the Beck Depression Inventory (BDI) (Beck, Steer, & Brown, 1996). In several studies of UK mental health in-patients, although not the main aim of the research, authors have highlighted possible environmental causes of poor sleep. For example, Donaldson and Chintapanti (2009) suggested that unfamiliar settings, medication and hospital noise (e.g. voices of patients and staff, doors opening and closing and televisions) could have affected in-patients' sleep. Moreover, prolonged and consistent hospital noises have been strongly suggested to be a cause of insomnia (Lower, Bonsack & Guion, 2002; Simpson, Lee, & Cameron, 1996; Topf & Davis, 1993). However, confounders such as mental and physical health were not considered in most studies, which could have influenced the results. Factors such as noise, medication and unfamiliar settings have been studied previously in some manner as possible causes of insomnia in the general population. Each one of these factors is likely to be present in a hospital on a consistent basis. However, it is not clear whether increased rates of insomnia are due to the nature of the environment, the persons within it or other, unknown, factors. Nevertheless, it is possible that forced-contact with other patients and staff in a restricted environment increases the likelihood of developing insomnia.

### *2.2.8 Why is it important to treat insomnia?*

Insomnia is one of the most common health disorders and can develop due to various factors. Despite this it is under-appreciated, under-diagnosed and therefore, under-treated (Chilcott & Shapiro, 1996). The concerns regarding insomnia are five-fold: it is prevalent and widespread; incessant; has high economic costs; results in daytime consequences; and is a risk for developing other conditions (Matteson-rusby, Pigeon, Gehrman & Perlis, 2010).



*Chapter 2* has already discussed the relationship between medical and psychiatric conditions and insomnia. Perhaps what has not been established is the impact on daytime functioning, one of the insomnia diagnostic criteria.

Two large studies showed the impact of insomnia on cognitive and social functioning (Kyle et al., 2013; Leger et al., 2010). In a cross sectional study, Leger and colleagues (2012) examined the presence of daytime consequences in 2,085 individuals with chronic insomnia, compared to 1,982 good sleepers, across France, US and Japan. Daytime consequences (e.g. impairments in social functioning, physical problems, mental health and general health perception) were measured using the reliable Short Form Health Survey of Medical Outcomes Study (SF-36). Results showed that those with chronic insomnia had significantly worse SF-36 scores than their good sleeper counterparts. The study provides additional evidential support that poor sleep negatively affects cognitive, social and physical health. However, the SF-36 measure is not specifically designed to examine the impact of poor sleep; this may be a study limitation. Recently, Kyle et al. (2013) designed the first measure to specifically assess the impact of poor sleep on daytime dysfunction and quality of life impairment. The measure, the Glasgow Sleep Impact Index (GSII), was used to assess the impact of poor sleep in 108 patients with diagnosed DSM-V Insomnia Disorder (ID). Results showed that the most commonly reported negative consequences of ID were low energy and motivation, poor cognitive functioning, poor social functioning, poor health/low wellbeing and impairment in relationship functioning. This study provides evidence that poor sleep can negatively impact upon daytime functioning. However, the lack of a control group makes it hard to conclusively determine whether negative outcomes and poor sleep were causally related.

A study conducted by Pillai et al. (2016) suggests that the negative impacts of insomnia can be persistent. In one of the first longitudinal studies of insomnia, which applied DSM-V criteria on 649 people, they found 58.2% of adults still had DSM-V insomnia at 1 year after baseline assessment (n=378), including daytime consequences. However, two-thirds (66%) of individuals, whilst no longer meeting DSM-V diagnostic criteria (n=271), continued to experience sleep disturbance and consequential negative daytime consequences. Thus, combined with those who continued with DSM-V insomnia, the majority of adults continued to experience symptoms a year after initial diagnosis, indicating high levels of continued treatment need.

Insomnia results in both direct (e.g. healthcare) and indirect (e.g. loss of productivity) costs. In the US, direct costs, namely clinician consultations, medication and non-pharmacological treatment have been estimated at \$100 billion annually (Fullerton, 2006). Indirect costs, including absenteeism, poor work performance and accidents, have been demonstrated to cost between \$77 and \$92 billion per year (Matteson-rusby et al., 2010). A review examining the socioeconomic impact of insomnia in the working population also concluded that insomnia

could lead to more work accidents, absenteeism and less productivity (Metlaine, Leger, & Choudat, 2005).

A final reason to treat insomnia is the potentially positive influence it may have on reducing symptoms in other conditions. Insomnia is a known risk factor for the onset of medical conditions (e.g. hypertension, heart disease, diabetes etc.) and psychiatric conditions. For example, the most robust evidence relates specifically to insomnia and depression. Research suggests treating the insomnia could indirectly improve medical and psychiatric symptoms (Edinger, Wohlgemuth, Krystal & Rice, 2005; Leger et al., 2010; Rusch, Guardado, Baxter, Mysliwiec & Gill, 2015). In a study of 44 military American adults, Rusch and colleagues explored the relationship between improved sleep quality and reduction in depression. Results showed treating insomnia with cognitive behavioural therapy for insomnia (CBTi), a non-pharmacological intervention, improved sleep quality but also reduced depressive symptoms. Indeed there are now numerous studies looking at insomnia comorbid with other conditions with the aim of using a transdiagnostic treatment<sup>5</sup> approach (Harvey, 2008), that is, treating both the insomnia and condition together rather than as single disorders.

## **2.3 The management of insomnia**

The management of insomnia is dependent on various factors including the population type and duration of symptoms (Schutte-Rodin, Broch, Buysse, Dorsey, & Sateia, 2008). This section will initially examine National Institute of Health and Care Excellence (NICE) guidance in relation to insomnia management (NICE, 2004). NICE exists to provide national guidance in England, but additionally commonly adopted by the devolved nations, to improve healthcare services based on the best evidence, experts and thorough reviews. Their guidance is known for its “rigour, independence and objectivity” (NICE, 2016). Based on this guidance, this section will then examine the evidence around the effectiveness of pharmacological and non-pharmacological treatment and their treatment advantages and disadvantages. Discrete management challenges within forced-contact closed environments will also be considered, alongside issues with staff-patient interpersonal relationships and patient perceptions of different treatment modalities.

### *2.3.1 Pharmacological treatment*

#### 2.3.1.1 NICE guidance

Pharmacological treatment is the most commonly used and researched intervention in insomnia management (Walsh & Schweitzer, 1999). There are a number of different types of

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<sup>5</sup> ‘Transdiagnostic or ‘unified’ treatments apply the same underlying treatment principals across mental disorders, without tailoring the protocol to specific diagnoses’ (p.21, McEvoy, Nathan, & Norton, 2009)

drugs prescribed to treat insomnia, including benzodiazepines (e.g. loperazolam, temazepam), non-benzodiazepine hypnotics, known commonly as the “z-drugs” (zopiclone, zolpidem and zaleplon) and “off-label” use of non-insomnia specific drugs with sedative action (e.g. antidepressants and antipsychotics). Antihistamines (e.g. promethazine) can be used but are not recommended because of insufficient evidence of their effectiveness (NICE, 2015). NICE has produced clinical guidance on the use of the three main hypnotic z-drugs, as compared (where possible) with benzodiazepines (NICE, 2004), both of which are commonly prescribed in primary care.

NICE guidance for treating insomnia was produced based on the evaluation of high quality evidence, including 24 randomised controlled trials (RCTs), producing four recommendations for prescribing hypnotic medication. Firstly, non-pharmacological interventions should always be used before pharmacological interventions are implemented. Secondly, the most cost-effective hypnotic drug available should be prescribed. Thirdly, if one hypnotic drug does not work in reducing or eliminating insomnia, another drug should not be substituted. Finally, hypnotic drugs including benzodiazepines should only be prescribed for short-term use; the maximum recommended prescription time is four weeks. Hypnotic medication is not usually recommended for long-term, chronic insomnia (NICE, 2015).

#### 2.3.1.2 Effectiveness of pharmacological treatment

Pharmacological interventions for insomnia have usually been evaluated against six main outcome measures. These include total sleep time, sleep-onset latency, number of awakenings, wake after sleep onset, sleep quality and daytime consequences. Dündar et al. (2004) produced both a systematic review and a meta-analysis to assess the efficacy of drug therapy in insomnia management. The z-drugs (zopiclone, zolpidem and zaleplon) and the main benzodiazepines, including diazepam, loperazolam and lorazepam, were compared and contrasted using several evaluative sleep outcomes. Of 24 selected studies, results showed that there was no single superior drug in reducing insomnia symptoms. However, zaleplon showed significantly less sleep-onset latency than the other drugs. Nonetheless, the small number of studies could indicate unrepresentative and possible unreliable results, and an underestimation of the effect of the hypnotic drugs.

Buscemi et al., 2007 conducted a meta-analysis on a larger sample of 105 random controlled trials that examined the effectiveness of pharmacological interventions for chronic insomnia. Both benzodiazepines and non-benzodiazepines were effective in decreasing sleep onset latency. Results showed that many of the studies failed to include the evaluative criteria required to show efficacy of the intervention. In Dündar et al.'s (2004) systematic review and meta-analysis, z-drugs were compared with benzodiazepines in terms of clinical and cost-effectiveness. Results showed in general there was no significant difference of clinical effectiveness between drug types, therefore all types of sleep medication were deemed effective in reducing insomnia symptoms. More recently, a systematic review of the

effectiveness of pharmacological treatment for ID was completed using data from 35 RCTs (Wilt et al., 2016). Effect sizes were small for eszopiclone and zolpidem compared to placebo and evidence strength was low to moderate. Over 10 years later research is still insufficient to conclude hypnotic medications are effective and, success rates over different durations and comparative medication effectiveness is still lacking. However, we do know that all have been associated with side effects such as dizziness, fatigue and headache when compared to placebos. Moreover, the reviews do not compare against less commonly prescribed medications, such as melatonin.

Melatonin is a hormone used as an alternative to benzodiazepines and non-benzodiazepines. Recent reviews and meta-analyses have examined the effectiveness of melatonin in adults. Auld and colleagues reviewed 5,030 articles that studied its effectiveness under controlled conditions, concluding that melatonin reduced sleep-onset latency, was effective in patients with delayed sleep syndrome and regulated sleep-wake patterning (Auld, Maschauer, Morrison, Skene & Riha, in press). These results were largely replicated in a further 14-study meta-analysis which reported melatonin lessens sleep-onset latency, particularly in older adults (Ferracioli-Oda, Qawasmi, & Bloch, 2013). One of the most recent RCTs to investigate the effectiveness of prolonged released melatonin (PRM), found that, in 791 Scottish adults, there was no significant reduction in insomnia symptoms over a six-month period (Wade et al., 2010). However, PRM did significantly reduce sleep latency in older adults specifically. This suggests that, as supported by previous RCTs, melatonin should possibly be administered in older adults only (Lemoine, Nir, Laudon, & Zisapel, 2007; Lemoine, Wade, Katz, Nir, & Zisapel, 2012; Wade et al., 2010). Nevertheless, whilst deemed safe and effective in the short-term, the limited number of large scale RCTs provides no confidence in its effectiveness long term.

The benefits of pharmacological interventions for insomnia must be weighed against the adverse effects of using such medicines. NICE recommends hypnotic medication for short-term insomnia, which can result in rapid clinical improvements (Asnis, Thomas, & Henderson, 2016; NICE, 2015). However, negative outcomes associated with hypnotic medication use include increased risk of drug overdose, dependence and acquired tolerance to the drug, withdrawal syndrome and rebound insomnia. Such issues contribute to the type of long-term use of the medication that is not recommended by NICE guidance (2004). Moreover, medication only treats the symptoms of insomnia, not the cause.

### *2.3.2 Non-pharmacological treatment*

NICE specifies that non-pharmacological treatment should always be attempted prior to short-term drug therapy (NICE, 2004). A range of non-pharmacological treatments for insomnia have been used in primary care including good sleep hygiene, cognitive behavioural intervention (e.g. CBTi; Mitchell, Gehrman, Perlis, & Umscheid, 2012); alternative therapies

(e.g. acupuncture; Cheuk, Yeung, Chung & Wong, 2007); and mind-body therapies (Kozasa et al., 2010). Despite the vast number of interventions available, only a select few are formally considered and recommended by NICE (exercise, cognitive behavioural interventions and sleep hygiene).

#### 2.3.2.1 Sleep hygiene

Sleep hygiene education is often considered the first line non-pharmacological method of managing insomnia in the general population. The fundamental aim of sleep hygiene is to change health and environmental factors that might affect sleep (Kyle, 2013). Good sleep hygiene practices typically incorporate five main steps: 1) avoid caffeine/cigarettes; 2) avoid alcohol; 3) do not watch the clock; 4) exercise regularly; and 5) maintain a peaceful bedroom environment (i.e. no light, no noise and comfortable surroundings) (Morin & Benca, 2012). In addition, watching television or using electronic devices (e.g. mobile phone, tablet etc.) is generally not recommended as recent evidence suggests exposure to blue light delays sleep onset (Chang, Aeschbach, Duffy & Czeisler, 2014; Pilonis et al., 2016). Nonetheless, some researchers have found that the use of media does not significantly impact upon tiredness (Custers & Van den Bulck, 2012). Although there are no RCTs or systematic reviews establishing its effectiveness, the principles of sleep hygiene are commonly cited in the literature (Budur, Rodriguez, & Foldvary-Schaefer, 2007; Morin et al., 2015).

#### 2.3.2.2 Cognitive behavioural intervention

There is evidence to suggest that a focus on cognitive change and subsequent behaviour is an effective method of improving poor sleep (Mitchell et al., 2012; Wang, Wang, & Tsai, 2005). NICE (2015) supports the use of the following psychological interventions for insomnia: paradoxical intention (a cognitive therapy that helps the patient to confront fear of staying awake), biofeedback (helps individual to control a physiologic variable through visual or audio feedback) (Hauri, 1981), stimulus control therapy (Bootzin, 1973), sleep restriction therapy (Spielman, Saskin, & Thorpy, 1987), sleep hygiene, cognitive therapy, relaxation techniques, and the most common and effective, cognitive behavioural therapy for insomnia (CBTi) (Mitchell et al., 2012), which encompasses the latter five approaches (Manber, 2012) (see table 3). CBTi aims to address perpetuating (e.g. poor sleep hygiene, dysfunctional beliefs about sleep, stimulus dyscontrol) factors associated with insomnia and can be delivered to patients with comorbid insomnia or insomnia only. Before CBTi is given, an initial assessment of possible underlying causes of sleep disturbance is performed, other sleep disorders are ruled out and patient motivation for treatment is established (Perlis, Benson-Jungquist, Smith, & Posner, 2014). CBTi is usually delivered as part of a holistic package but there are exceptions. For example, sleep restriction therapy is usually contraindicated for patients with bipolar disorder, untreated sleep apnoea and parasomnia because of the risks of aggravating the underlying condition(s). However, some researchers suggest adaption of some CBTi components can be an alternative to removing them entirely from the treatment

package (Soehner, Kaplan & Harvey, 2013). For example, patients with depression lack motivation to keep to the sleep schedule proposed by stimulus control instructions. Therefore setting encouraging activities that persuade the patient to get out of bed could help to keep to the schedule.

Table 3: Description of CBTi components

<b>Component</b>	<b>Description</b>
Stimulus control	Reconditioning the bedroom to promote good sleep
Sleep restriction	Limiting time in bed (TIB) to the average self-reported sleep time slowly increasing time in bed (TIB) as sleep improves
Cognitive therapy	Targets dysfunctional beliefs and thoughts about sleep
Relaxation techniques	Progressive muscle relaxation, visual imagery to help reduce somatic anxiety related to sleep
Sleep hygiene education	Limit coffee, alcohol and exercise before bed. Promote good sleep including keeping bedroom quiet, dark and at a cool temperature

CBTi on its own has been identified as the “gold standard” of treatment for chronic insomnia in the USA, (Morin et al., 2015; National Institute of Health, 2005). CBTi is mostly used to treat insomnia within primary care, whether face to face or using an internet platform, thus most evidence of its effectiveness exists within this population group (Mitchell et al., 2012) (Trauer, Qian, Doyle, Rajaratnam & Cunnington, 2015) (Cheng & Dizon, 2012; Seyffert et al., 2016). However, several systematic reviews and meta-analyses have examined the effectiveness of CBTi in other populations, for example those with insomnia comorbid with cancer, anxiety, pain and other psychiatric symptoms that may constitute the underlying cause of sleep disturbance (Jansson-Fröjmark & Norell-Clarke, 2016; Taylor & Pruiksma, 2014). For example, a systematic review of 16 RCTs testing CBTi in psychiatric populations with comorbid insomnia found CBTi to be an effective way of treating the sleep problem and psychiatric symptoms (Taylor & Pruiksma, 2014). A more recent review generally agreed insomnia symptoms were reduced in this population following CBTi but, overall, conclusions on improving psychiatric symptoms including depression, were mixed (Jansson-Fröjmark & Norell-Clarke, 2016). Extending these findings to psychiatric inpatients is needed because the additional situational and environmental contributory factors evident in these restricted settings may indicate a need for an adapted CBTi treatment to account for these factors.

However, although inpatients may present as a different population research in this area is rare. One study examined the impact of CBTi on sleep quality and depressive symptoms in inpatients with a diagnosis of insomnia and depression (n=24) residing in a restricted psychiatric hospital setting (Hsu et al., 2015). There was emphasis on sleep hygiene and sleep environmental factors but, overall, CBTi addressed education about sleep and Spielman’s 3P model tackled changing cognitions that interfere with good sleep, good sleep

hygiene practice, sleep restriction, relaxation techniques and relapse prevention, compared with a control group (health education manuals for insomnia). Measures including the Pittsburgh Sleep Quality Index (PSQI), Dysfunctional Beliefs and Attitudes about Sleep Scale (DBAS) and Hamilton Rating Scale for Depression (HDRS) were administered pre and post intervention, and showed an improvement in subjective sleep quality and sleep beliefs and attitudes. However, treatment effects for sleep quality reduced after discharge to community; this may be because of the lack of support with individual components of insomnia post-discharge. For example, patients may have needed refresher sessions on cognitive therapy, sleep hygiene and stimulus control and an adapted approach for their new community setting and routine. Limited RCTs exist that examine CBTi effectiveness in inpatient settings and none exist in prisons. More RCTs are needed to ascertain the effectiveness and relevance of individual CBTi components in other restricted settings including prisons and long-term post-discharge.

Overall, CBTi is effective in the long term and across various populations; however, when compared with hypnotic medication, it may have limitations, particularly in short-term effectiveness. Mitchell et al. (2012) conducted a systematic review on the effectiveness of CBTi compared to medication (294 patients). Results showed that when using GRADE<sup>6</sup> evidence quality criteria, CBTi is at least as effective in long-term management (i.e. 6 months or more) of insomnia compared to medication (e.g. zopiclone, zolpidem, temazepam and triazolam). However, CBTi was less effective than temazepam in short-term management. The evidence was only based on five studies; therefore results should be interpreted with caution. Despite the small number of studies on outcomes of CBTi it should be noted that, in a practical sense, CBTi is often expensive because it can require trained staff delivering one-to-one sessions. In addition, as improvements in sleep are not usually seen for several weeks, there can be early drop out of treatment before insomnia symptoms are reduced.

### 2.3.2.3 Alternative interventions

Hypnotic drug therapy and CBTi are the most common and most effective treatments for insomnia; however the former is not recommended for long-term insomnia and has subsequent risk effects, whilst the latter is difficult to implement for some individuals (Sarris & Byrne, 2011). Recently, a collection of alternative interventions has gained attention (Sarris & Byrne, 2011). These therapies include mindfulness (Garland, Zhou, Gonzalez & Rodriguez, 2016), alternative exercise (Tai-Chi; (Irwin, Olmstead & Motivala, 2008; Irwin et al., 2014)); yoga; (Manjunath & Telles, 2005), physical manual therapy such as acupuncture (Cheuk et al., 2007) and acupressure (Yeung et al., 2012). Reviews have been conducted on each therapy. Overall, there is some support for yoga, acupressure and tai chi (Cheuk et al., 2007; Hughes, Towler, Storey, Wheeler & Molassiotis, 2015; Irwin et al., 2014; Mustian, 2013),

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<sup>6</sup> Grading of Recommendations, Assessment, Development and Evaluations

mixed support for acupuncture (Shergis et al., 2016) and limited evidence of the effectiveness of valerian (a herbal medicine), lavender oil and massages (Bent, Padula, Moore, Patterson, & Mehling, 2006; Fisser & Pilkington, 2012; Leach & Page, 2015; Sarris & Byrne, 2011). Furthermore, NICE does not currently recommend valerian or acupuncture and does not mention lavender oil, yoga or tai chi at all in its guidance (NICE, 2015). Although some studies support the effectiveness of alternative therapies, to generate more solid evidence such therapies would need to be evaluated against existent recommended interventions such as hypnotic medication and CBTi in large RCTs over adequate follow-up periods.

### *2.3.3 Pharmacological combined with non-pharmacological*

There is support for combining the main treatment modalities of hypnotic medication and CBTi. Morin and Benca (2012) have proposed treating insomnia through initially integrating drug therapy and CBTi, gradually reducing medication whilst continuing CBTi. To my knowledge, only five studies have examined combined psychological and pharmacological therapy to assess their effectiveness (Jacobs et al., 2004; Morin, Colecchi, et al., 1999; Morin, Vallières, et al., 2009; Børge Sivertsen et al., 2006; Wu, Bao, Zhang, Deng, & Long, 2006). Overall, there is little difference in effectiveness when comparing combined therapy to single therapies, but successful outcomes for CBTi over the long-term were evident. Moreover, small sample sizes and lack of robust methodologies linked to NICE guidance present a large gap in the literature; therefore recommendations cannot yet be made for practice. This is particularly problematic for people with prior insomnia treatment history as it can affect the treatment outcome. For example, whilst treatment recommendations are standardised, some people respond differently to psychological therapies and drug therapies than expected and sequential treatment may be needed, particularly with comorbid conditions. Research is needed to examine this, as it is possible that CBTi might not be effective in people who are already dependent on hypnotic medication. A study by (Soeffing et al., 2009) examined this notion in older hypnotic dependent adults. Results showed CBTi improved sleep in individuals who were dependent on hypnotic drugs. However, it is not obvious to the reader how many participants were included in the study in order to establish the significance and representativeness of the impact of CBTi on people with a recent history of hypnotic medication use. An RCT is currently underway examining the effectiveness of sequential sleep medication and CBT for insomnia over a period of 3, 6, 9 and 12 months (Morin et al., 2016). However, at present there is limited evidence to suggest combined treatment is more effective than CBTi alone (Schutte-Rodin et al., 2008).

### *2.3.4 Insomnia treatment in a forced-contact closed environment*

Reasons for poor sleep in a forced-contact environment such as hospitals are multifaceted. As previously mentioned, factors can include noise, unfamiliar settings, light, medication and which are in addition to known precipitating factors including chronic illness. Two systematic reviews have been completed to investigate the effectiveness of pharmacological and non-



pharmacological interventions in hospital settings respectively (Kanji et al., 2016; Tamrat, Huynh-Le & Goyal, 2014). In 13 studies comparing interventions such as relaxation, sleep hygiene and massages to treatment as usual, Tamrat and colleagues concluded there was insufficient evidence to suggest non-pharmacological interventions are effective in improving sleep. However, evidence of the effectiveness of pharmacological interventions were also deemed insufficient (Kanji et al., 2016). Kanji and colleagues included 15 studies in their review and found no one drug was more effective than any other. Both systematic reviews concluded all studies lacked quality thus more robust RCTs are needed to fully ascertain the effectiveness of insomnia treatment in hospital settings.

Despite not knowing 'what works' for insomnia in hospital settings, provision still occurs and therefore understanding patient preference is important. Patients who are willing to try a non-pharmacological alternative treatment still prefer hypnotic medication (Azad, Byszewski, Sarazin, McLean, & Koziarz, 2003; Shaw et al., 1999). One survey study examined preference for pharmacological and non-pharmacological treatments for insomnia in 100 hospitalised patients (Azad et al., 2003). They found that, whilst two-thirds of patients were willing to try a non-pharmacological alternative, non-pharmacological options were only offered to 11% of all patients. In contrast, one author found that chronic insomnia patients already using hypnotic medication would refuse a non-pharmacological alternative (McDowell, Mion, Lydon, & Inouye, 1998). It is possible that these results occurred due to a generally poor understanding of the strengths of non-pharmacological intervention by the practitioners, but also perhaps a relative lack of availability and complexity of arranging such care, and that this limits patient choice. Therefore, there seems to be logistical and practical issues to introducing non-pharmacological interventions in a hospital setting.

The examination of the relationship between psychiatric disorders and insomnia has been extensive, however, few studies have specifically investigated interventions for insomnia in in-patient psychiatric settings, another forced-contact environment. Moreover, to my knowledge, only one study has directly examined the effectiveness of pharmacological intervention for insomnia (i.e. trazadone and zaleplon) in a psychiatric setting (Schwartz et al., 2004). Unfortunately, the paper was unavailable for full-text download therefore I cannot infer any findings based on the abstract alone. Furthermore, no studies have examined the effectiveness of zolpidem or zopiclone in psychiatric inpatients. However, one study conducted across two forensic psychiatric settings in the Netherlands examined treatment for insomnia. In a small sample (n=110), just over a third of patients with insomnia received hypnotics specifically (35%), nonetheless the majority received sleep-promoting medications, including antipsychotics (Kamphuis, Karsten, de Weerd, & Lancel, 2013). Furthermore, receiving these drugs did not alleviate symptoms of insomnia.

## 2.4 Healthcare needs and treatment issues in prison

This section discusses the prevalence of mental and physical illnesses in prison and the treatment environment in prisons, including prisoner-staff relationships and the challenges of delivering care of an equivalent standard to that available in the wider community. A brief overview of insomnia in prison is presented followed by the first paper; a systematic integrative review of the sleep-prison literature.

### 2.4.1 *The prison population*

The world prison population is increasing. A Prison Studies report found that the world prison population in most countries had increased between 2006 and 2015 (from 9.8 million to 10.4 million; Walmsley, 2009, 2016). The US makes up just under a quarter of the total world prison population, comprising 2.2 million in 2014 (Walmsley, 2016). In comparison to the US imprisonment rate of 698 per 100,000, the rate in England and Wales is considerably lower at 148 per 100,000. However, compared to the rest of Northern Europe, England and Wales has the fifth largest imprisonment rate behind Lithuania, Latvia, Estonia and Jersey (UK) higher (268, 239, 216 and 152 respectively) (Walmsley, 2016).

### 2.4.2 *Poor mental and physical health and substance misuse in a prison population*

Prisoners are significantly more likely to have issues with mental and physical ill-health and histories of substance misuse than the general population (Fazel & Baillargeon, 2011). Poor mental health is a significant problem in the prison population (Brugha et al., 2005). A landmark UK psychiatric morbidity study by Singleton and colleagues (1998) revealed that over 90% of the prison population had at least one mental disorder. The most common diagnoses were personality disorder (66%), depression or anxiety (45%) and drug dependency (45%). In contrast, a methodologically comparable study in the general population found that just over one in ten people had depression or anxiety and one in twenty people had a personality disorder or drug dependency (13.8%, 5.3% and 5.2% respectively) (Singleton & O'Brien, 2000). Alcohol dependency was the second most common mental health problem in the general population, but was just under two thirds less likely than in a prison setting (12% and 30% respectively). These comorbidity figures were broadly replicated in more recent meta-analyses (Fazel, Bains & Doll, 2006; Fazel & Danesh, 2002; Fazel & Seewald, 2012). Systematic reviews have been completed for mental health and substance misuse (Fazel et al., 2006; Fazel & Danesh, 2002). However, a review of physical health is over 20 years old. Fazel completed narrative review of the health of prisoners which included a discussion of non-infectious conditions (Fazel & Baillargeon, 2011). Fazel revealed studies showed higher rates of chronic physical disorders in prisoners compared to the general population (Baillargeon et al., 2009; Binswanger, Krueger, & Steiner, 2009; Feron, Paulus, Tonglet, Lorant & Pestiaux, 2005; Mathew, Elting, Cooksley, Owen, & Lin, 2005; Wilper et al., 2009). For example, Binswanger and colleagues found considerably higher rates of cervical cancer and hepatitis (odds ratio [OR] 4.82 and 4.23) in prisoners than the general population

and, to a slightly lesser extent, increased prevalence of asthma, arthritis and hypertension (odds ratio [OR] 1.34, 1.66 and 1.17) (Binswanger et al., 2009).

#### 2.4.3 *Prescribing in prison*

Seen in the community, but of particular risk in prison include prisoners trading, selling or misusing medication. Indeed, medication has high currency value in prison and can lead to feigning illnesses, deception and peer bullying (Ireland, 2002; Stewart, 2007). A Home Office qualitative study examined the drug market, including drug use, supply and demand across six UK prisons (Penfold, Turnbull & Webster, 2005). Results showed that prescribed medication was often sold to other prisoners. The recruited prisoners (n=96) reported that benzodiazepines and antidepressants were the most commonly used non-prescribed drugs within the prisons, however illicit drugs including cannabis, heroin and crack cocaine were the most commonly used overall. Drug misuse impacts on how staff assess insomnia and prescribe appropriate medication, which can therefore affect their ability to fully follow community guidelines. For example, staff may refuse to prescribe medication due to concerns about the possibility of illicit misuse, trading and diversion. Staff concerns about drugs being sold/traded could mean genuine cases of insomnia are diagnosed and it's therefore left untreated. Untreated insomnia can be harmful to the prisoner and others. For example, untreated insomnia can lead to self-medication with illicit substances, suicide completion, fatigue-related accidents and an increase in violence risk in prison (Elger, 2008). The detection and treatment of genuine cases of insomnia in prisoners is therefore integral in reducing such risks.

#### 2.4.4 *Interpersonal relationships between staff and prisoners*

Good communication between prison and healthcare staff and prisoners is important in securing effective treatment outcomes (Bowen, Rogers & Shaw, 2009). Using semi-structured interviews with prisoners and staff and observations of actual clinical consultations, Bowen et al. examined the issues of medication management in prison. With regards to the staff-prisoner relationship, they found mutual distrust operating when medication was requested, prescribed and supplied. Some staff felt prisoners may have attempted to deceive them in order to be prescribed medication. In contrast, prisoners stated they rarely discussed their opinions towards their own treatment as they thought healthcare staff would just ignore them. Disparities such as these are concerning as they may contribute to poor staff-patient relationships.

In a similar qualitative study, Plugge, Douglas and Fitzpatrick (2008) examined women prisoner's experiences and opinions of healthcare across two UK prisons. Thirty-seven women were recruited for six focus groups and twelve structured interviews. Overall, results showed that women prisoners felt that: healthcare staff had poor attitudes towards them; healthcare staff were not as competent as staff in the community; the quality of prison

healthcare was poor; and there were specific difficulties accessing medication. Both of these qualitative studies highlighted a clear gap between prisoner treatment expectations and their lived experiences. In regards to the success of insomnia management, prisoners' preference towards treatment, indeed whether to accept or refuse treatment should be considered (Elger, 2008).

## **2.5 Insomnia in prison**

This section comprises treatment and demographic considerations that are not included in the integrative review at the end of this chapter (**paper 1**).

### *2.5.1 Relevance of multi-component CBTi treatment in a prison population*

CBTi is the first choice treatment for chronic insomnia in the USA and UK and has demonstrated effectiveness as a multi-component treatment (Morin et al., 2015; National Institute of Health, 2005) (see Table 3). CBTi is modelled on the psychobiological inhibition model/A-I-E pathway (Perlis et al., 2011) (see 2.1.4). To recap, CBTi encompasses five components: sleep hygiene, stimulus control therapy, relaxation, cognitive therapy and sleep restriction therapy. Some components may be more relevant depending on the perpetuating factors of the sleep disturbance and may differ in a prison population compared with the community (Taylor & Pruiksma, 2014). The following section attempts to explore the potential relevance of CBTi components for use in prison.

It is likely that sleep hygiene education is derived from Spielman's 3P model of insomnia (Spielman & Glovinsky, 1991). This is because the model acknowledges perpetuating factors that exacerbate sleep difficulties, including poor sleep hygiene practice (Spielman, Caruso, & Glovinsky, 1987). However, definitive evidence of this model link is undetermined. Sleep hygiene education, whilst lacking evidence as a single component, makes up part of the multi-component CBTi and is usually undertaken in primary care as part of the initial advice to a person with insomnia (NICE, 2015). Sleep hygiene education may be relevant to a prison population as many sleep hygiene suggestions such as the avoidance of napping and the reduction of stimulants are within the control of prisoners and self-management is encouraged to help prisoners take control of their own health (Royal College of General Practitioners & Royal Pharmaceutical Society, 2011). To my knowledge, there is only one study that has examined the effectiveness of a sleep hygiene intervention in prisoners (Hodges-Crowder, 2007). In a PhD study, 75 prisoners were randomly assigned to the sleep hygiene intervention, relaxation intervention comprising muscle relaxation, deep breathing and stretching exercises or control group to assess whether interventions improved sleep quality. After four weeks, results showed no significant effect on sleep quality in either of the intervention groups. These findings are comparable to other studies that show sleep hygiene is not effective in other populations (Dietrich, Francis-Jimenez, Knibbs, Umali, & Truglio-Londrigan, 2016). Therefore, whilst the sleep hygiene component is relevant to *prisoners*

because of the high likelihood of them spending long periods in a joint living and sleeping environment, coupled with limited opportunities for vocational and work activities, as a single component it is not effective and should be attempted only be in combination with the other CBTi components.

Cognitive therapy is a single component derived from the cognitive model for insomnia (Harvey, 2002). It has gained considerable attention as a stand-alone intervention for insomnia in relation to targeting unhelpful beliefs (Harvey et al., 2007). Indeed, without changing cognitive processes that can maintain the insomnia the problem may persist. The cognitive therapy component may be particularly relevant to prisoners that have developed problems maintaining sleep because they have unhelpful beliefs about sleep, are worried about not sleeping or are fearful of the daytime consequences of not sleeping. For example, a prisoner may expect to sleep as well as they did in the community and when their sleep patterns are not the same in prison, they start to worry about not sleeping. Therefore, emphasis on altering unrealistic expectations regarding sleep in a problematic environment of the prison through cognitive therapy may be required.

The cognitive model of insomnia (Harvey, 2002) explains 'worries' in relation to insomnia development. The cognitive model suggests the anxious state experienced when worrying subsequently makes the individual overestimate the effect this will have on their sleep and daytime functioning. This then results in actual sleep deficit and negative effect on daytime functioning. Rumination, worry and anxiety are common concerns within the general population; however, they are considerably more likely in a problematic prison environment. For example, worry about not sleeping and other non-sleep issues such as family, medical problems and prison-related concerns are evident in this vulnerable prisoner group (Elger, 2009). Subsequent dedication to relaxation techniques may ease general, sleep-related and prison-related anxiety and may be particularly relevant to prisoners.

Spending up to 23 hours a day in a cell, which is possible in the prison population, may alter prisoner perception and make distinguishing between a 'living' and a 'sleeping' environment difficult. Indeed, prisoners who have trouble sleeping are unable to leave their sleeping environment easily or independently, at a time and for a duration of their choosing, as deemed necessary as part of stimulus control (Green & Brown, 2015). Prisoners may also exhibit stimulus dyscontrol by eating, reading, watching TV, working, cleaning and worrying in the same environment that they sleep in (Perlis et al., 2011). Therefore, their 'sleeping environment' is likely to be associated with arousal, negatively affecting sleep-onset which potentially makes the stimulus control component (e.g. reconditioning a prisoner's cell to promote good sleep) paramount to improving prisoner's sleep.

Sleep restriction therapy (SRT) may be considered controversial because it initially restricts sleep depending on self-reported total sleep time (TST) to address excessive time in bed.

However, it is one of the most effective CBTi components (Morin et al., 1994). SRT has not been examined in prisoners; however, it is likely it would be relevant to this population because sleep restriction therapy can help to improve sleep quality and reduce anxiety and suicide ideation in individuals in restricted settings (Breutstein et al., 2014), issues which are likely for prisoners. Prisoners are four times likely to experience mental health anxiety and depression and seven times more likely to complete suicide than the general population (Fazel & Danesh, 2002; Fazel & Seewald, 2012; Fazel & Baillargeon, 2011). Nevertheless, implementing SRT in practice with prisoners may be difficult because time in bed (TIB) should never be less than six hours for patients with mental health problems but may be needed to treat insomnia effectively (Spielman, Chien-Ming & Glovinsky, 2010). Furthermore, prisoners would need to practice self-discipline to keep to the sleep routine set by therapist which could be difficult for some prisoners (Green & Brown, 2015).

In summary, consideration of CBTi's individual components and potential emphasis on stimulus control, cognitive therapy and relaxation may be needed to treat insomnia in a prison population.

#### 2.5.2 *Pharmacological intervention guidance for insomnia in prison*

In 2011, the Royal College of General Practitioners and the Royal Pharmaceutical Society (RCGP/RPS) produced a document that was designed to give guidance to practitioners about prescribing medication in a prison setting in England and Wales. Using a traffic light system, drugs designated as “green” are deemed to carry the lowest risks in treatment. Drugs under the “amber” indicator are considered appropriate if previous treatment has not been successful (e.g. first-line medications or non-pharmacological treatment see NICE, 2004). Lastly, drugs within the “red” category are not considered appropriate in a prison setting and present the highest risk. They should be used only when no other treatment is available.

According to the RCGP/RPS guidance, medications recommended for insomnia in prison include melatonin, the common z-drugs and promethazine (all categorised as ‘amber’). Notably, benzodiazepines are categorised as red for insomnia and use is *specifically* discouraged over other drug treatment (e.g. z-drugs). The RCGP/RPS consider temazepam (a particular short-acting benzodiazepine) a “red” drug.

When treating insomnia, practitioners need to take into account the individual's particular mental and physical health needs. Whilst it might be considered standard practice to prescribe hypnotic drugs for short-term insomnia (NICE, 2015), clinicians in prisons need to consider the full range of factors that can influence treatment. For example, they may need to account for coexisting health problems or treatment needs that are prevalent among prisoners. For example, if the prisoner has a drug addiction or is drug dependent, it is possible that drug therapy for insomnia could have a negative impact on any drug

dependence treatment. This is because hypnotic drugs can be addictive (Department of Health, 2006), therefore prolonging dependence. Moreover, whilst pharmacological treatment can reduce insomnia in some prisoners, it can be ineffective in others (Elger, 2004a). Therefore, alternatives to hypnotic medication should be available in prisons.

### *2.5.3 Prisoner treatment preference for insomnia*

A recent paper examined the perspectives of prisoners and prison staff in prescribing psychotropic medications for various psychiatric disorders in prison (Hassan, Edge, Senior & Shaw, 2013). Participants' responses suggested that psychotropic medication (i.e. those which affect mental state and behaviour) was used to reduce psychiatric symptoms as well as to improve coping behaviour and reduce insomnia. Security measures and the pressures of the prison regime also introduced added complexities with hypnotic prescribing. For example, staff perceived pressure to prescribe medication with sedating properties. The restrictions of the prison regime meant that prisoners were locked up in the evening unable to access night-time medication at appropriate times. Instead, hypnotic medicines were commonly administered too early, under supervised conditions during the afternoon, meaning they were asleep during the evening and awake during night. Furthermore, some prisoners identified a reliance on psychotropic medication such as antidepressants for their sedative, rather than mood improving, properties, due to what they considered to be inadequate access to hypnotic medicines. This is concerning as it is possible that reliance on medication not specifically designed to treat insomnia can be damaging to other mental and physical health needs.

It has been suggested that some prisoners prefer pharmacological to psychosocial interventions, particularly among those with a history of substance misuse (Royal College of General Practitioners & Royal Pharmaceutical Society, 2011). Anecdotally, reasons for medication preference can include a need to validate their condition with a "physical" intervention and/or to exchange the drug for financial gain. Moreover, (Jaeger & Monceau, 1996) examined the epidemiology of hypnotic and anxiolytic medication in a French prison (including both remand and sentenced prisoners). One hundred and two prisoners were asked if they had insomnia and their opinion on insomnia treatment. Prisoners reported a preference for hypnotic medication, arguing it helped them survive being imprisoned by being able to sleep at night and relax during the day.

### *2.5.4 Gender and age differences of insomnia in prison*

In the general population, insomnia is most common in older adults and women (Morin, Be, et al., 2009; NICE, 2004). There is no reason why this should not also be the case in prison, yet the limited research tends to focus almost exclusively on men who, internationally, form the largest majority of prisoners; for example, in England and Wales 95% of the prison population is male (HMPS, 2016). Indeed, to my knowledge, in the prison studies that have looked at sleep problems, only four prison studies have looked at women (Harner & Budescu, 2014;

Mahmood, Tripodi, Vaughn, Bender, & Schwartz, 2012; O'Brien, Mortimer, Singleton, & Meltzer, 2001; Sumter, Monk-Turner, & Turner, 2009). None of these specifically investigated insomnia disorder (DSM-V criteria) and only one used a recommended measure for assessing insomnia symptoms (Harner & Budescu, 2014). In a cross-sectional descriptive exploratory study of 438 American women prisoners (20 years of age or older), 72% women prisoners were identified as poor sleepers using the Pittsburgh Sleep Quality Index (Harner & Budescu, 2014). Whilst studies examining insomnia among women in prison are rare, there are even fewer studies directly comparing the prevalence of insomnia in men and women in prison (Diamond, Magaletta, Harzke, & Baxter, 2008; Kjelsberg & Hartvig, 2005; Singleton et al., 1998) and no studies exist that solely focus on prevalence of insomnia in prison as their main objective. Therefore, there is insufficient evidence to determine whether insomnia is more problematic in women and older prisoners, as is the case within the general population.

The following paper, published in *Sleep Medicine Reviews* now provides a full review of the sleep-prison literature.



**Prevalence, associated factors and management of insomnia in prison populations: an integrative review**

Dewa LH, Kyle S, Hassan L, Shaw J, Senior J.

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## **Summary**

Prisoners have many potential risk factors for insomnia including mental ill health and substance misuse. However, literature on prevalence, associated factors and management of insomnia in prison has yet to be systematically examined in this group. The paper objective was to synthesise and appraise the research that examines insomnia in a prison environment. An integrative literature review using thematic analysis was conducted to critically reflect on the current evidence base and outline a prospective research agenda. From the original 384 sourced papers, 33 met the inclusion criteria and were subsequently included for review. Definitions of insomnia and assessment tools used in studies varied considerably making the overall validity of findings uncertain. Notably, no studies used a recommended measure to assess Insomnia Disorder (ID). Thematic analysis yielded five themes: 1) the varied prevalence of insomnia; 2) the comorbidity of insomnia, psychiatric disorder and substance misuse; 3) the negative influence of prison-related situational and environmental factors on insomnia; 4) the role of hypnotic medication, and, 5) preliminary indications that non-pharmacological treatment can improve sleep. The methodological heterogeneity and variable quality across studies in the assessment of insomnia means conclusive data on prevalence, associated factors and management is lacking. Nonetheless, sleep problems are common and impairing in prison, are linked to comorbid conditions and negatively influenced by the prison environment, which routinely provides limited scope for effective management. Future research in prison populations is needed to reliably identify insomnia prevalence and determine how it can be managed effectively.

## **Keywords**

Insomnia; prison; prevalence; hypnotics; non-pharmacological treatment; integrative review

## INTRODUCTION

In the United States, nearly 1% of the adult population is incarcerated at any one time (Walmsley, 2013). It has been estimated that the majority of prisoners have some type of mental disorder (Brooke, Taylor, Gunn & Maden, 1996; Brugha et al., 2005; Fazel & Danesh, 2002; Fazel & Seewald, 2012). While much work has focused on mental health and physical comorbidity in prison populations (see Fazel & Seewald, 2012) for review), there has been comparatively little research on insomnia specifically, either as a symptom of these disorders or a disorder in its own right. Crucially, the prison context may both directly interfere with sleep-wake regulation and present a barrier to effective management of sleep disturbance.

General population studies report that around a third of people experience general insomnia symptoms and between 5 and 15% experience clinically defined Insomnia Disorder (ID) (Morin & Benca, 2012; Roth, 2007). This wide prevalence range reflects the differing definitions of insomnia and the variety of assessment tools adopted by different studies (Morin & Jarrin, 2013). In terms of agreed definitions of insomnia, all three commonly used sleep classification manuals accept that the main symptoms of insomnia are a persistent problem initiating or maintaining sleep; experiencing early morning awakenings; and/or non-restorative sleep (American Academy of Sleep Medicine, 2014; American Psychiatric Association, 2013; World Health Organization, 1992). To obtain disorder status at a clinical threshold, daytime functioning such as concentration, work productivity and mood must be adversely affected. The most widely accepted risk factors for insomnia are: being female (Zhang & Wing, 2006); increasing age (Foley et al., 1995; Sivertsen et al., 2009; Stewart et al., 2006); and comorbid physical and psychiatric disorders (Morin & Benca, 2012). Insomnia can negatively impact on quality of life (Kyle, Morgan, & Espie, 2010) and is a risk factor for the future onset of cardiovascular disease, depression and anxiety disorder and even mortality (Vgontzas, Fernandez-Mendoza, Liao, & Bixler, 2013). However, hypnotic medication (e.g. zopiclone, zolpidem, diazepam etc.) (Riemann & Perlis, 2009) and non-pharmacological treatments (e.g. cognitive behavioural therapy (CBT) etc.) (Morin et al., 2006; C. Morin, Hauri, et al., 1999; Stepanski & Wyatt, 2003) can improve insomnia, health and non-health related quality of life symptoms (Kyle et al., 2010).

Around 90% of prisoners have some sort of mental disorder including personality and substance misuse disorders (Singleton et al., 1998). The high prevalence of mental disorder, physical health problems, substance misuse issues and prescription medications within prison settings may also compound premorbid sleep disturbances, given the recognised relationship between sleep and health (Brugha et al., 2005; Fazel & Danesh, 2002; Hassan et al., 2011; Hassan, Weston, Senior, & Shaw, 2012). Due to the nature of the prison regime normal sleep-wake patterning may be affected through interruption of usual daily routines (Levin & Brown, 1975); forced contact with others (Weiner, 2012); fear of violence (Liebling & Arnold, 2012); and lack of autonomy (Royal College of General Practitioners & Royal Pharmaceutical Society, 2011). Features of the physical environment are also likely to confer

further disturbance to sleep-wake regulation including exposure to extreme hot or cold temperatures (Clinical Practice Guidelines Working Group, 2007); experiencing too much or too little light (Hauri, 1981); excessive noise (Hauri, 1981; Kageyama et al., 1987) (e.g. cell doors slamming, prisoners shouting, keys jangling etc.); and inadequate bedroom setup (e.g. poor mattress quality) (Morin & Espie, 2003). It is not known what non-pharmacological interventions for insomnia are offered across the prison estate internationally, however some general interventions have been recommended in the United Kingdom (UK) policy literature, including psychological therapies, lavender, milky drinks and sleep hygiene advice as preferable to prescribing medication (Royal College of General Practitioners & Royal Pharmaceutical Society, 2011).

There has been only one other review conducted in this area to date. In a scoping review published in 2007, Elger (Elger, 2007) asked three research questions: 1) are sleep complaints in prisoners caused by substance misuse, post-traumatic stress disorder and mental disorder including insomnia; 2) is insomnia situational; and; 3) what is the importance of reactive anxiety and depression due to being imprisoned compared to prison environmental factors (e.g. light, noise etc.). The review included nine research studies in its analysis, however inclusion and exclusion criteria were not identified and there was no objective evaluation of study quality. Thus there remains the need for an up-to-date rigorous review, which examines these factors. Therefore, in this integrative review we collate, describe and discuss the available insomnia-prison literature, identifying key themes for research and practice. The paper will critically reflect on the method and quality of conducted studies, and outline a thorough research agenda, delineating a series of studies required to further elucidate the prevalence and management of insomnia in prison settings.

## **METHODOLOGY**

Systematic reviews and meta-analyses rigorously assess research evidence, usually concentrating on gold standard studies including randomised controlled trials (RCTs). There was a clear lack of RCTs in this area therefore an integrative review method was chosen. This approach permits an integrated assessment and comparison of many different research methods (e.g. experiment, semi-structured interview etc.), regardless of design (Whittemore & Knafl, 2005). An integrative review routinely consists of five stages of work: search strategy, search outcome, data extraction, data evaluation and data synthesis (Ward, Hoare & Gott, 2014). These stages are outlined below with reference to our particular study.

### ***Search strategy***

Cochrane Library, EMBASE, MEDLINE, Evidence Based Medicine Reviews and PsycINFO were identified as the over-arching databases to be interrogated. A series of search operators of insomnia-related terms were developed, with insomnia-related terms sleep, sleepless\*, sleep problem, sleep disturbance\*, hypnotic, z-drug, zopiclone, zolpidem, zaleplon and melatonin searched in conjunction with prison-specific terms, including prison, imprison\*,

prisoner, inmate, correctional, jail, custody, offender, detainee or incarcerated\*. All ages were included. Finally, in an attempt to capture any recent peer reviewed and/or data-based grey literature, requests for information were circulated via email distribution lists, professional networks and social media.

### **Grey literature**

Google and Google Scholar were searched for results relevant to search criteria. The first 10 pages were screened and assessed for relevance. Reports were identified, retrieved and included in this review.

**Table 1: Inclusion and exclusion criteria**

<b>Inclusion criteria</b>	<b>Exclusion criteria</b>
Peer reviewed primary research	Books, dissertations, conference abstracts, summaries of reports, editorials, reviews, guidance, legislation, discussion papers
All accessible papers in English language	Study did not involve prisoners
Between 1946 to 4 <sup>th</sup> quarter 2013	No mention of sleep problems and/or insomnia in the paper
	Sleep disorders other than insomnia only (e.g. sleep apnoea, sleep-movement disorder etc.)
	Prisoner of war sleep disturbance

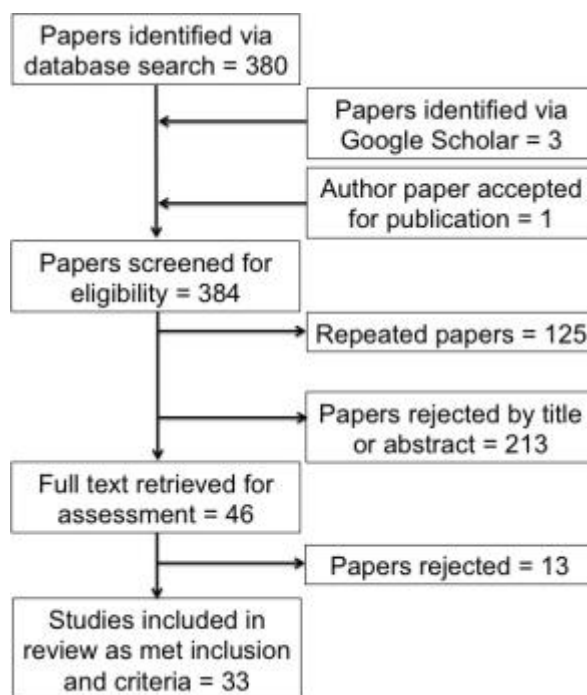
### **Search outcome**

Three hundred and eighty-four articles were found in the original search. One hundred and twenty-five papers were duplicates and a further 213 were rejected as irrelevant based on review of the title and abstract alone. Full manuscripts for the remaining 46 papers were then obtained and reviewed against the inclusion and exclusion criteria (see Table 1). Following full text retrieval, a further thirteen articles were removed which resulted in the inclusion of thirty-three papers (see Fig 1).

### **Data extraction**

A standard data extraction method was used. For each paper, we documented author, year and country; study design (main; quantitative/qualitative and specific; experiment, questionnaire design etc.); setting (e.g. type of prison) and participants (e.g. demographics); sleep measure and reliability; main aim and results; and data specifically related to self-report

of sleep quality and problems with initiating and maintenance of sleep (insomnia<sup>7</sup>) (see Tables 3-8).



**Fig 1:** Search results.

### **Data evaluation**

To date, there is no single, standardised critical appraisal tool that can be used for all study designs. Moreover, integrative reviews allow the incorporation of a range of research designs, making global critical assessment difficult. In line with previously published integrative reviews (Ward et al., 2014), Hawker and colleague’s checklist was used to evaluate study quality of both quantitative and qualitative research designs to ensure validity and methodological rigour (Hawker, Payne, Kerr, Hardey & Powell, 2002). We used critical appraisal criteria and evaluated across nine domains: 1) abstract/title; 2) introduction and aims; 3) method and data; 4) sampling; 5) data analysis; 6) ethics and bias; 7) results; 8) transferability and generalisability; and 9) implication and usefulness (Hawker et al., 2002). A study quality score was assigned to each domain on a descending scale of quality (good: 40 points; fair: 30 points; poor: 20 points; or very poor: 10 points). Each study’s scores were summed and then divided by 9 to get a total score (Hawker et al., 2002) (see Table 3). Each domain examined has an overall question and specific statements of what evidence was required to meet each rating level. For example, for domain one, the overall question required assessment of “Did they provide a clear description of the study?”. The first author (LD) scored each paper. A “good” score was given if there was a structured abstract with full information and clear title, through to a “poor” score being warranted where there was no abstract at all.

<sup>7</sup> Sleep disturbance, sleep problems or insomnia reflect difficulties with sleep initiation or maintenance. The ambiguous terminology used in the included papers reflects the lack of appropriate sleep assessment and precisions when interpreting sleep complaints.

### ***Data synthesis***

All papers were imported into NVivo qualitative software package (QSR International Pty Ltd, 2008). Using a thematic analysis approach, there were then six main stages of data synthesis: 1) familiarisation with the data; 2) generating initial codes across all content; 3) bringing the codes together to make up themes; 4) reviewing themes in relation to the overarching objectives; 5) defining, naming and finalising the themes; and 6) producing the extracts for each theme (Braun & Clarke, 2006).

## **RESULTS**

### *Overview of evidence*

Overall, using Hawker et al.'s checklist, seven studies were rated as good (Carli et al., 2011; Diamond et al., 2008; Hassan et al., 2013; Ireland, Boustead & Ireland, 2005; Lader, Singleton & Meltzer, 2000; O'Brien et al., 2001; Singleton et al., 1998), twenty-one as fair (Abrams & Siegel, 1978; Elger, 2003, 2004a, 2009; Elger & Sekera, 2009; Eytan et al., 2011; Feron et al., 2005; Harty, Duckworth, Thompson, Stuewig & Tangney, 2010; Hassan, Senior, Frisher, Edge & Shaw, 2014; Hughes & Boland, 1992; Ireland, 2005; Ireland & Culpin, 2006; Karacan et al., 1974; Kashani et al., 1980; Kjelsberg & Hartvig, 2005; Lutz, 1990; Mahmood et al., 2012; Nasset, Rustad, Kjelsberg, Almvik & Bjørngaard, 2011; Rogers, Jackson, Salekin & Neumann, 2010; Sumter et al., 2009; Toler, 1978) and five as poor (Elger, 2004b; Elger, Goehring, Revaz & Morabia, 2002; Haghghat, Tabatabaee & Boogar, 2014; Ihalainen, 1989; Reeves, 2012). The studies that were rated as poor mainly had an inadequate introduction and/or lacked clear research questions or objectives and limited explanation of the methodology and the sampling strategy. For example, four poor studies failed to include sample size calculations, details of recruitment or response rates (Elger et al., 2002; Haghghat et al., 2014; Ihalainen, 1989; Reeves, 2012). Indeed, across the 33 studies only one study showed evidence of a sample size calculation (Feron et al., 2005). Nearly all studies included limited evidence that ethical considerations had been addressed or generalisable to wider populations. This was mainly because of a minimal description of the prison setting or sample details (e.g. age, race etc.) or an underrepresentation of female prisoners. All seven good studies provided evidence of sampling, adequately described the recruitment, scales and method used and largely used sub-sections of standardised general health measures (e.g. Hamilton depression rating scale; HDRS (Hamilton, 1960), general health questionnaire; GHQ (Goldberg & Hillier, 1979)) to identify insomnia. Moreover, they all provided a clear statement of findings that was directly linked to the aims of the study.

### *Thematic analysis*

The thematic review revealed five main themes from the included studies:

- The varied prevalence of insomnia;
- The comorbidity of insomnia, psychiatric disorder and substance misuse;

- The negative influence of prison-related situational and environmental factors on sleep;
- The prescribing of hypnotic medication; and
- Preliminary indications that non-pharmacological treatment can improve sleep.

***Theme 1: The varied prevalence of insomnia***

The most common theme identified across 12 papers was the widely varied reported prevalence rates of insomnia (see Table 3) (Carli et al., 2011; Diamond et al., 2008; Elger, 2004b; Feron et al., 2005; Karacan et al., 1974; Kashani et al., 1980; Kjelsberg & Hartvig, 2005; Lader et al., 2000; Mahmood et al., 2012; Nettet et al., 2011; O'Brien et al., 2001; Singleton et al., 1998). The estimated insomnia prevalence rates ranged from 10.9% to 81.0%. The variation appears to have been due to differences in the insomnia criteria used as well as differences in population studied including variation in age, gender and sentence type. In one study, the prevalence was difficult to infer because an exact figure was not included (Feron et al., 2005). Also, the identification of sleep disturbance and comorbid conditions was not the main aim of the study. Overall, sample sizes ranged from 513 to 3563 participants, with all authors deeming their particular sample size acceptable to make estimates of prevalence. Only one prevalence study provided a formal sample size calculation and used a random sample (Feron et al., 2005), which are important factors in ensuring studies are adequately powered and that samples are representative, thereby improving generalisability. Moreover, only one study used an appropriate control to further validate the prevalence rate enabling relative comparisons between incarcerated and non-incarcerated populations to be made (Kashani et al., 1980).

The method used to identify prevalence differed across the papers. Some studies used unstandardised questionnaires (Diamond et al., 2008; Elger, 2004b; Mahmood et al., 2012; Nettet et al., 2011) whilst others used discrete sub-sections of standardised general health measures including the clinical interview schedule (CIS-R) (Lader et al., 2000; O'Brien et al., 2001; Singleton et al., 1998); HDRS (Carli et al., 2011); ICPC-2 (Feron et al., 2005; Kjelsberg & Hartvig, 2005); and the Diagnostic and Statistical Manual of Mental Disorders, 3<sup>rd</sup> edition (DSM-III) (American Psychiatric Association, 1978). Although the HDRS and DSM-III are valid and reliable, the accuracy of the prevalence data is in doubt. This is because insomnia was defined as a symptom of other conditions or behaviour (e.g. depression, suicide) (Carli et al., 2011; Kashani et al., 1980), combined with another condition (e.g. anxiety) (Feron et al., 2005) or was identified as a result of the prisoner taking hypnotic medication (Kjelsberg & Hartvig, 2005). Insomnia is not reliably identified as a symptom or as a disorder. In contrast, the CIS-R measure and most of the unstandardised sleep measures specifically asked questions about sleep problems, giving the reader more confidence in the prevalence data, at least in the particular sample studied, if not more generally. Nevertheless, the reliability, accuracy and comparability of the non-standard measures are unknown, thus it is difficult to reliably determine the scale and severity of insomnia in prisons.



**Table 2: PSQI component mean scores of three studies (standard deviation)**

PSQI	Elger 2003. T1 (Consultation for insomnia) (n=40)	Elger 2009. Consultation for insomnia (n= unknown)	GS (n= unknown )	Elger & Sekera 2009. Consultation for insomnia (n=86)	GS (n=61)
C1 Subjective sleep quality	2.0 (0.9)			2.1 (0.7)	0.6 (0.6)
C2 Sleep latency	2.3 (1.1)			2.4 (1.1)	0.8 (0.9)
C3 Sleep duration	2.1 (1.2)			2.2 (1.1)	0.3 (0.5)
C4 Habitual sleep efficiency	1.6 (1.4)			1.9 (1.3)	0.3 (0.6)
C5 Sleep disturbance	1.6 (0.7)			1.6 (0.7)	1.0 (0.3)
C6 Sleep medication	2.0 (1.4)			1.7 (1.4)	0.0 (0.2)
C7 Daytime dysfunction	0.7 (1.0)			1.0 (1.1)	0.3 (0.5)
PSQI total score	12.3 (4.7)	12.5 (4.0)	3.2 (2.0)	12.8 (4.0)	3.2 (2.0)

**Key: GS:** good sleepers

One recommended and validated insomnia assessment is the Pittsburgh sleep quality index (PSQI) (Buysse, Ancoli-Israel, Edinger, Lichstein & Morin, 2006). The higher the PSQI total score, the poorer the sleep quality. In one study, PSQI total scores were reported as significantly higher in prisoners that had consultations for insomnia than good sleepers (GS) (see Table 2) but similar to a community sample of people with insomnia ( $12.5 \pm 38$ ) (Backhaus, Junghanns, Broocks, Riemann & Hohagen, 2002). However, the PSQI was only used on Swiss unconvicted prisoners; with a small sample and were mainly male. Consequently, generalising findings to sentenced prisoners, women or prisoners residing in other countries is difficult.

From the few studies that reported data on women, insomnia or sleep problems were more common than in men. Indeed, the highest prevalence rates were found consistently at around 81% in women (O'Brien et al., 2001; Singleton et al., 1998). This finding reflects a similar pattern in the community (Zhang & Wing, 2006). Only two studies focused on women only (Mahmood et al., 2012; O'Brien et al., 2001) and three studies generated gender-specific prevalence rates (Diamond et al., 2008; Kjelsberg & Hartvig, 2005; Singleton et al., 1998). Study samples, overall, were predominantly male and from white ethnic backgrounds. Other ethnicities were under-represented, with three studies failing to report ethnicity at all (Carli et al., 2011; Feron et al., 2005; Kjelsberg & Hartvig, 2005). Given that black and minority ethnicities (BME) are overrepresented in prisons, especially in the USA and UK, this limits the generalisability of such findings to wider prison populations. Similarly, the included studies did not explore the effect of increasing age as a risk factor, even though this is contrary to what is a risk factor in the community. With regards to criminogenic factors, three studies examined unconvicted and sentenced prisoners, finding that insomnia tended to be more common in

the former (Lader et al., 2000; O'Brien et al., 2001; Singleton et al., 1998). Overall, insomnia symptoms prevalence was higher in a prison population than in the general population (30%-36%) (Morin & Jarrin, 2013) with the exception of just two studies (10.9% and around 20%) (Diamond et al., 2008; Feron et al., 2005). The former study identified this figure based on whether the prisoner had been prescribed hypnotic medication only and not by prisoner self-report of insomnia symptoms. Therefore, this is likely to reflect an underestimation of insomnia in a prison population.

***Theme 2: The comorbidity of insomnia, psychiatric disorder and substance misuse***

A number of studies identified a significant relationship between insomnia and psychiatric disorder (Elger, 2004b; Elger & Sekera, 2009; Eytan et al., 2011; Harty et al., 2010; Mahmood et al., 2012). Prisoners with insomnia were significantly more likely to have a history, or current symptoms of, psychiatric disorder than good sleepers (Elger, 2004b; Elger & Sekera, 2009). This relationship was particularly evident with prisoners who had a diagnosis of personality disorder (PD) (Harty et al., 2010; Mahmood et al., 2012) or those who identified depression (Elger, 2004a) or anxiety (Elger, 2004a, 2004b, 2009) as a source of insomnia symptoms. There was a significant and complicated negative relationship between insomnia and anxiety (Elger & Sekera, 2009; Haghghat et al., 2014; Ireland, 2005; Ireland et al., 2005; Lutz, 1990), except in one study which found that as both state and trait anxiety increased, subjective sleep quality decreased (Haghghat et al., 2014). However, this sample was not randomised, other highly co-morbid conditions were not controlled for and the data lacked both clarity and appropriate exploration in the study's discussion and conclusions. Moreover, all but one study (Elger, 2004b) used a standardised scale to measure mental ill health.

The evidence of the relationship between substance misuse and insomnia is mixed, with two studies sharing a significant association with opiate and cocaine use (Elger & Sekera, 2009; Harty et al., 2010) but not cannabis, and others sharing no association (Carli et al., 2011). Data on psychosis were collected in seven studies (Elger, 2004b; Eytan et al., 2011; Kjelsberg & Hartvig, 2005; Lader et al., 2000; O'Brien et al., 2001; Rogers et al., 2010; Singleton et al., 1998) but participant numbers were either very low in one study or not assessed against insomnia in the remaining. Physical pain was significantly more likely in prisoners with insomnia than good sleepers (Elger & Sekera, 2009). However, this finding was reported for only one study with a reasonable sample size (n=147). Skin and respiratory problems were found to be significantly related to insomnia (Eytan et al., 2011). No studies examined the implications of wider physical ill health, such as cardiovascular disease, gastrointestinal or sleep disorders other than insomnia. In conclusion, the comorbidity of physical ill health, psychosis and insomnia requires further investigation in order to make valid conclusions.

**Table 3**

*Theme 1: The varied prevalence of insomnia<sup>8</sup>*

Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
(Carli et al., 2011). <b>Italy</b> <b>Quality good</b>	<b>Quantitative</b> Questionnaire	<b>Setting:</b> All male penitentiaries <b>Demographics:</b> 1427 male prisoners (age range 18-77 years) <b>Sample:</b> Not specified (only sentenced prisoners approached)	<b>Standardised measure sub-section:</b> HDRS (Hamilton, 1960) items 4,5,6 and the "insomnia" were identified by summing the items together. <b>Reliability <math>\alpha</math>:</b> not mentioned. However, taken elsewhere the Cronbach alpha reliability for the HDRS ranges from .46 to .97 (Bagby, Ryder, Schuller, & Marshall, 2004).	<b>Main aim</b> To examine the association between sleep and suicidal behaviour in several Italian penitentiaries. <b>Results</b> The association between suicide and insomnia was significant ( $r=0.343$ ; $p<.0001$ ) particularly in prisoners who had a lifetime history of suicide attempts.	Just under two thirds of the sample scored on the insomnia cluster (61.2%).
(Diamond et al., 2008). <b>USA</b> <b>Quality good</b>	<b>Quantitative</b> Cross-sectional design Questionnaire	<b>Setting:</b> 14 prisons <b>Demographics:</b> 2674 offenders (22.7% female; mean age 33.6) <b>Sample:</b> All newly admitted prisoners over 18 months that completed the admission questionnaire.	<b>Unstandardised measure</b> PSIQ (Federal Bureau of Prisons, 1993) <b>Reliability <math>\alpha</math>:</b> Not specified.	<b>Main aim</b> To identify reasons for psychological services on first arrival to a US prison. <b>Results</b> Around one tenth of prisoners on admission to prison ask to see psychological services. Conditions that significantly predicted consultation included male sex, history of treatment for mental health, symptoms of depression and sleep problems.	Sleep problems was the most common reason to see psychological services at entry to prison at 62.7% for men and 81.2% for women. Sleep problems significantly predicted the request the psychological services (OR = 2.36).
(Elger, 2004b). <b>Switzerland</b> <b>Quality poor</b>	<b>Quantitative</b> Combined prospective and retrospective design. Questionnaire/medical records	<b>Setting:</b> Remand prison <b>Demographics:</b> 995 prisoners (2772 consultations) who had a health consultation in prison.	<b>Unstandardised measures:</b> GP questionnaire that highlighted insomnia as a reason for consultation over a year period.	<b>Main aim</b> Focus was to explore the prevalence and associated factors of insomnia in prisoners.	Based on the 995 prisoners that had a consultation in a year and on two sources (insomnia consultation questionnaire and review of

<sup>8</sup> Only the main themes are included in each table. However, studies might have several cross over several themes (e.g. prevalence and comorbidity of insomnia, psychiatric disorder and substance misuse)

Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
(Feron et al., 2005). <b>Belgium</b> <b>Quality fair</b>	<b>Quantitative</b> Retrospective cohort study. Medical records.	<b>Groups:</b> 127 SMNI (14.2% female; mean age 31.4) 104 SMI (12.5% female; mean age 28.9) 615 NSMNI (7.2% female; mean age 31.6) 149 NSMI (8.7% female; mean age 31.4) <b>Refined groups:</b> 112 NSMI prisoners (9.8% female; mean age 30.9) and 103 NSMNI prisoners (6.8% female; mean age 29.7) <b>Sample:</b> Consecutive <b>Setting:</b> 33 prisons <b>Demographics:</b> 513 patients (7.4% female; mean age 34.1) <b>Sample:</b> Randomised	Medical records. <b>Reliability <math>\alpha</math></b> = not mentioned.  <b>Standardised measure sub-section:</b> ICPC-2 (World Organization of National Colleges and Academic Associations of General Practitioners/Family Physicians. Classification Committee, 1998). Code P06 for sleep disturbance. <b>Reliability</b> = not mentioned. See above.	<b>Results</b> Insomnia is prevalent in a prison population. Moreover, chronic insomnia was more common than transient insomnia. The 112 prisoners with insomnia were more likely to have a history of psychiatric illness, prescriptions of psychotropic medication and had symptoms of depression and anxiety in prison than those 103 prisoners without insomnia.  <b>Main aim</b> The reasons for GP consultation in a prison. <b>Results</b> A range of reasons for GP consultation including administrative procedures (22.0%), psychological health (13.1%) and respiratory (12.9%). Anxiety and sleep disturbance was found in almost three-quarters of the total sample (71.0%).	the notes), 44.3% complained of insomnia. Around 51.0% of this group with insomnia also had substance misuse issues.  Moreover, sleep disturbance alone was found in just fewer than 20% of the consultations. Sleep disturbance was the second most common psychological reason for GP consultation.

Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
(Karacan et al., 1974). <b>US</b> <b>Quality fair</b>	<b>Quantitative</b> Experiment.	<b>Setting:</b> Union Correctional Institution <b>Demographics:</b> 44 prisoners (12 white male prisoners who had been convicted of rape/12 white prisoners convicted of other offences) and 12 non-convicted controls (all aged 22-54 years). <b>Sample:</b> Not specified	<b>Objective measure</b> NPT, sleep EEGs and EOG were taken on three consecutive nights. <b>Unstandardised measure</b> Self-report questionnaire on sleep quality upon awakening <b>Reliability <math>\alpha</math></b> = not mentioned.	<b>Main aim</b> To investigate whether men that rape have significant NPT immaturity. Knowing that children have higher level of Non-REM sleep the authors felt that this might also be present in rapists. <b>Results</b> There were no significant differences found on personality between the two prison samples. Prisoners convicted of rape had significantly lower IQ than the other prison group.	Overall, the prisoners convicted of rape experienced less time in bed, lower sleep quality and a higher proportion awake than community controls.
(Kashani et al., 1980). <b>US</b> <b>Quality fair</b>	<b>Quantitative</b> Questionnaire/ forensic records.	<b>Setting:</b> Juvenile Justice Centre <b>Demographics:</b> 100 incarcerated adolescents (29.0% girls; mean age 14.6) and 50 non-incarcerated (36.0% girls; mean age 14.9). <b>Sample:</b> Incarcerated not specified; non-incarcerated randomly selected	Sleep difficulty was identified as a symptom of depression using the DSM-III criteria (American Psychiatric Association, 1978).	<b>Main aim</b> To establish the prevalence of depression in young prisoners <b>Results</b> Depression was significantly found in 18% of comparison of incarcerated delinquents compared to 4% of non-incarcerated delinquents.	Just under a third of non-depressed incarcerated young prisoners (31.7%) but all of the 18 depressed young prisoners had sleep disturbances.
(Kjelsberg & Hartvig, 2005). <b>Norway</b> <b>Quality fair</b>	<b>Quantitative</b> Medical records (Medication sheet identifying psychiatric diagnosis)	<b>Setting:</b> 37 regular prisons <b>Demographics:</b> 2617 prisoners (5.8% females; mean age 33.9). <b>Sample:</b> Consecutive	<b>Standardised measure sub-section</b> ICPC-2 (World Organization of National Colleges and Academic Associations of General Practitioners/Family Physicians. Classification Committee, 1998). Code P06 for sleep disturbance.	<b>Main aim</b> To identify the prevalence of psychiatric and physical health comorbidity across several prison establishments. <b>Results</b> Just over a third of the sample had psychiatric symptoms (35.5%) including depression (11%). Another third had physical health conditions (32.0%).	Just over one in ten (10.9%) had a "sleep disorder" (sleep disturbance). Sleep disturbance was the second most common condition across all ICPC-2 codes (World Organization of National Colleges and Academic Associations of General Practitioners/Family Physicians. Classification Committee, 1998).

Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
(Lader et al., 2000) <b>UK</b> <b>Quality good</b>	<b>Quantitative</b> Questionnaire.	<b>Setting:</b> All England and Wales prisons <b>Demographics:</b> 632 young offenders with 590 full interviews (18.1% female; 16-20 years old) <b>Sample:</b> Stratified	<b>Standardised measure sub-section</b> CIS-R (Lewis & Pelosi, 1990; Lewis, Pelosi, Araya, & Dunn, 1992) (sleep problems as one of 14 sections). <b>Reliability</b> $\alpha = .84$	<b>Main aim</b> To highlight the psychiatric morbidity present in young offenders. <b>Results</b> Differences found male and female young offenders and between young offenders and adult offenders on numerous psychiatric conditions. In particular, young female offenders were more likely to have had treatment for mental health issues than their male remand and sentenced counterparts (27% compared to 13% and 11%).	Overall prevalence ranged from 52% in young male sentenced prisoners, to 60% in male remand prisoners. This prevalence was significantly higher than in the young male and female community population (22% and 23% respectively (Meltzer, Gill, Petticrew, & Hinds, 1995). In addition, the second most common drug prescribed to young female offenders was hypnotics and anxiolytics (14%).
(Mahmood et al., 2012). <b>US</b> <b>Quality fair</b>	<b>Quantitative</b> Secondary data analysis. Questionnaire/ medical records.	<b>Setting:</b> Maximum security penitentiary <b>Demographics:</b> 805 female prisoners (mean age 33.5) <b>Sample:</b> Not specified	<b>Unstandardised sleep measure</b> Dichotomous question: "Problems sleeping in prison compared to the community"	<b>Main aim</b> To explore the relationship between personality disorder and impulsivity in adaptation of prison. <b>Results</b> PD including SPD, AvPD, BPD and DPD significantly predicted anxiety and depressive symptoms. A diagnosis of DPD increased the chance of developing sleep problems than the other PD types.	A prevalence of 51.3% of women with personality disorders had sleeping problems. Women who had been in prison before were less likely to experience sleep problems than those first time in prison.
(Nesset et al., 2011). <b>Norway</b> <b>Quality fair</b>	<b>Quantitative</b> Cross-sectional design. Questionnaire.	<b>Setting:</b> 29 prisons <b>Demographics:</b> 1454 prisoners (95.0% male; mean age 34.7) <b>Sample:</b> Consecutive	<b>Unstandardised sleep measure</b> Self-report questionnaire that examined prisoner opinion of prison health care including sleep problems. Five-integer scale (no problems to all of the time)	<b>Main aim</b> To establish prisoner opinion of prison health care services. In particular, the differences between services for substance misuse, psychiatric and sleep problems. <b>Results</b> The most significantly common reason to see healthcare services were drug misuse and sleep problems.	Just over two-fifths of the sample had sleep problems often or all of the time (41.2%). Moreover, sleep problems significantly predicted help seeking behaviour at the prison health service (sleep problems often; OR 2.93, sleep problems all of the time; OR 2.83).

Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
(O'Brien et al., 2001). <b>UK</b> <b>Quality good</b>	<b>Quantitative</b> Questionnaire.	<b>Setting:</b> All England and Wales prisons <b>Demographics:</b> 771 female prisoners (aged 16-64 years) <b>Sample:</b> Stratified	<b>Standardised measure sub-section</b> CIS-R (Lewis & Pelosi, 1990; Lewis et al., 1992) (sleep problems as one of 14 sections) <b>Reliability</b> $\alpha = .84$	<b>Main aim</b> To highlight the psychiatric morbidity present in female offenders. <b>Results</b> Prevalence of neurotic symptoms including sleep problems and worry were evident in 66.0% of the sample population.	Similar to the previous psychiatric morbidity reports, sleep problems were the most common CIS-R symptom in both female remand and sentenced prisoners (81% and 62% respectively). Again, the prevalence was much higher than in the community (28%).
(Singleton et al., 1998). <b>UK</b> <b>Quality good</b>	<b>Quantitative</b> Questionnaire.	<b>Setting:</b> All England and Wales prisons <b>Demographics:</b> 3563 with 3142 full interviews (24.5% female; 16-64 years old) <b>Sample:</b> Stratified	<b>Standardised measure sub-section</b> CIS-R (Lewis & Pelosi, 1990; Lewis et al., 1992) (sleep problems as one of 14 sections) <b>Reliability</b> $\alpha = .84$	<b>Main aim</b> To explore the psychiatric morbidity of prisoners. <b>Results</b> Neurotic symptoms and disorders, including sleep problems and fatigue were identified as common mental health issues.	Sleep problems were the most common neurotic symptoms in both male and female remand prisoners (67% and 81% respectively) compared to other symptom type (e.g. depression, 56% and 64%, and anxiety 33% and 43%). Hypnotics and anxiolytics medication was the most common prescribed drug.

**Key:** **AvPD:** Avoidant personality disorder; **BPD:** Borderline personality disorder; **CIS-R:** Clinical Interview Schedule; **DPD:** Dependent personality disorder; **DSM-III:** Diagnostic and Statistical Manual of Mental Disorders, 3<sup>rd</sup> Edition; **EEG:** Electroencephalography; **EOG:** Electrooculography; **GP:** General practitioner; **HDRS:** Hamilton Depression Rating Scale; **ICPC-2:** International Classification of Primary Care-Version 2; **NSMI:** Non-substance misusing with insomnia; **NSMNI:** Non-substance misusing without insomnia; **NPT:** Nocturnal penile tumescence; **OR:** Odds ratio; **PD:** Personality disorder; **PSIQ:** Psychology Services Inmate Questionnaire; **SMI:** Substance misusing with insomnia; **SMNI:** Substance misusing without insomnia; **SPD:** Schizotypal personality disorder

**Table 4**

*Theme 2: The comorbidity of insomnia, psychiatric disorder and substance misuse<sup>8</sup>*

Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
(Elger & Sekera, 2009). <b>Switzerland</b> <b>Quality fair</b>	<b>Quantitative</b> Prospective design. Questionnaire.	<b>Setting:</b> Remand prison <b>Demographics:</b> 142 prisoners <b>Groups:</b> 81 insomnia prisoners (7.0% female; 29.1 mean age) and 61 GS (6.6% female; 27.2 mean age). <b>Sample:</b> Randomised	<b>Unstandardised measure:</b> "Insomnia" patients were counted if they asked for a consultation due to insomnia complaints or symptoms. <b>Standardised measure:</b> PSQI <b>Reliability</b> $\alpha = .83$	<b>Main aim</b> A focus on sleep quality in prisoners who complained of insomnia to assess associated factors that can predict insomnia. <b>Results</b> Those with insomnia consultation more likely to be on hypnotics compared to good sleepers (48.8% and 6.6% respectively). Binary logistic regression found that a history of sleep problems (OR of 13.3) significantly predicted insomnia in a prison population.	Additional factors that significantly predicted insomnia to a lesser extent included psychiatric history (OR of 8.3) and opiates (OR of 7.9). Both good and poor sleepers had experienced failed suicide attempts. Prisoners with insomnia were significantly more likely to blame sleep disturbances on having a stressful event in the last week (65.1% compared to 18.0%), stress in general (91.9% to 67.2%) and stress specific to prison conditions (38.4% compared to 16.4%) than GS.
(Eytan et al., 2011). <b>Switzerland.</b> <b>Quality fair</b>	<b>Quantitative</b> Medical records.	<b>Setting:</b> Remand prison <b>Demographics:</b> 1,510 files (5.0% female; mean age 30.0). <b>Sample:</b> Consecutive	<b>Standardised measure sub-section:</b> ICPC-2 (World Organization of National Colleges and Academic Associations of General Practitioners/Family Physicians. Classification Committee, 1998). Insomnia mentioned without stating how it was measured. <b>Reliability =</b> not mentioned. However, an average inter-rater reliability per ICPC-2 chapter as $K = .89$ (Frese,	<b>Main aim</b> To identify the prevalence of psychiatric disorders in a prison population. In addition, to understand the relationship between psychiatric symptoms, physical health conditions and substance misuse. <b>Results</b> A significant relationship was found between psychological symptoms (e.g. anxiety and insomnia) and physical health concerns (e.g. respiratory and circulatory).	A significant association was found between skin, respiratory problems and insomnia. However, it was not known whether insomnia was a prevalent condition in a prison environment.



Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
			Herrmann, Bungert-Kahl, & Sandholzer, 2012)		
(Haghighat et al., 2014). <b>Iran</b> <b>Quality poor</b>	<b>Quantitative</b> Cross-sectional design. Questionnaire.	<b>Setting:</b> Semnan prison; <b>Demographics:</b> 123 male patients who were tranquilliser users. Age not specified <b>Sample:</b> Consecutive	<b>Standardised measure</b> PSQI <b>Reliability <math>\alpha</math></b> = authors state between .78 to .82	<b>Main aim</b> To explore the relationship between anxiety, drug use and sleep disorders. <b>Results</b> Significant associations found between all parts of sleep (e.g. sleep latency, sleep quality and daytime functioning). Poor sleep quality was significantly associated with taking sedative medication. No relationship was found between illicit drugs and anxiety.	Total sleep score was significantly related to state and trait anxiety. No specific PSQI component data reported.
(Harty et al., 2010). <b>USA</b> <b>Quality fair</b>	<b>Quantitative</b> Questionnaire.	<b>Setting:</b> Jail; <b>Demographics:</b> 513 inmates (30% female; mean age 30.0) <b>Sample:</b> Not specified (but at least 4 month sentence)	<b>Standardised measure sub-section:</b> Sleep problems index as part of the PAI (Morey, 1991) (5 item index) and CHIPS measure (Cohen & Hoberman, 1983): <b>Reliability <math>\alpha</math></b> = .79	<b>Main aim</b> To investigate the relationship between BPD and sleep problems, despite depressive symptoms, in a large sample of prisoners. <b>Results</b> All four sub-scales of the borderline personality feature scale (affective instability, identity problems, negative relationships and self-harm) were significantly related to sleep problems.	Sleep problems were significantly associated with depression and borderline personality features even when controlling for substance misuse ( $r=.39$ , $p<.01$ ). However, sleep problems seem to be associated with depression and not anti-social personality factors ( $r=.07$ , $p>.05$ ).
(Ireland, 2005). <b>UK</b> <b>Quality fair</b>	<b>Quantitative</b> Questionnaire.	<b>Setting:</b> Unknown <b>Demographics:</b> 202 male offenders (102 juveniles; aged 15-17 years/100 young offenders; aged 18-21 years). <b>Sample:</b> Not specified	<b>Standardised measure sub-section</b> GHQ sub section of insomnia (Goldberg & Hillier, 1979) <b>Reliability <math>\alpha</math></b> = .86	<b>Main aim</b> To establish a relationship between bullying behaviour, anxiety and sleep problems. <b>Results</b> Just over two-fifths of sample reported being victimised in relation to bullying behaviour	There was a significant association between being a victim of bullying and increased anxiety and insomnia ( $\lambda=1.83$ , $t=2.88$ , $p<.01$ ).

Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
(Ireland & Culpin, 2006). <b>UK</b> <b>Quality fair</b>	<b>Quantitative</b> Questionnaire.	<b>Setting:</b> Unknown <b>Demographics:</b> 184 male prisoners (80 juvenile; aged 14-17 years/104 young; aged 18-20 years) <b>Sample:</b> Not specified	<b>Standardised measure</b> SCS (Asplund, 1995) <b>Reliability <math>\alpha = .84</math></b>	<b>Main aim</b> To look at the impact of prison on sleep, aggression and impulsivity before and after prison admission <b>Results</b> There was a significant relationship found between aggression and sleep quality and quantity. In particular, hostility predicted poor sleep quality and reduced number of hours of sleep.	Prisoners were significantly more likely to have more nightly awakenings (79%), poorer quality and reduced quantity of sleep during than before prison (50% respectively). The results showed a significant relationship between anger, aggression and poor sleep.
(Ireland et al., 2005). <b>UK</b> <b>Quality good</b>	<b>Quantitative</b> Questionnaire.	<b>Setting:</b> Young offenders institution <b>Demographics:</b> 203 male offenders (95 juvenile offenders; aged 15-17 years/108 young offenders; aged 18-21 years) <b>Sample:</b> Not specified	<b>Standardised measure sub-section</b> GHQ sub section of insomnia (Goldberg & Hillier, 1979) <b>Reliability <math>\alpha = .86</math></b>	<b>Main aim</b> To explore the relationship between coping style and psychological health including anxiety and insomnia. <b>Results</b> Rational coping style predicted decrease in psychological distress and in depression in both young and juvenile offenders respectively.	Increased emotional coping significantly predicted an increase in insomnia and anxiety for young offenders ( $\beta = .53$ ; $T = 6.42$ ; $p < .0001$ ) and juveniles ( $\beta = .52$ ; $T = 5.74$ ; $p < .0001$ ). In contrast, in young offenders increased rational coping predicted a decrease ( $\beta = -.24$ ; $T = -2.90$ ; $p < .005$ ).

**Key:** **CHIPS:** Cohen-Hobernab Inventory of Physical Symptoms; **GHQ:** General Health Questionnaire; **GS:** Good sleepers; **ICPC-2:** International Classification of Primary Care-Version 2; **OR:** Odds ratio; **PAI:** Personality Assessment Inventory; **PSQI:** Pittsburgh Sleep Quality Index **SCS:** Sleep Complaints Scale

**Table 5**

*Theme 3: The negative influence of prison-related situational and environmental factors on sleep<sup>8</sup>*

Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
(Elger, 2009). <b>Switzerland</b> <b>Quality fair</b>	<b>Quantitative</b> Questionnaire/ medical records.	<b>Setting:</b> Remand prison <b>Demographics:</b> 163 prisoners (94.0% men; 18-68 years (mean age 29±10 years). <b>Groups:</b> 102 prisoners with insomnia and 61 GS. <b>Sample:</b> Randomised	<b>Unstandardised measure:</b> "Insomnia" patients were counted if they asked for a consultation due to insomnia complaints or symptoms. <b>Standardised measure:</b> PSQI (Buysse et al., 1989) <b>Reliability <math>\alpha</math></b> = not mentioned. However, taken elsewhere the Cronbach alpha reliability for the PSQI is .83	<b>Main aim</b> To examine the main reasons for self-reported poor sleep quality (insomnia) with a focus on prison environmental factors and activities. <b>Results</b> There were significant differences between prisoners with and without insomnia complaints on how prison life is experienced. A significantly higher proportion of prisoners without insomnia took part in sports activity, watched television and discussed their day with other prisoners.	Total PSQI score in prisoners with insomnia (12.5) was significantly higher than GS (3.2). Binary regression analysis found that being worried about medical problems (OR 12.9), art activity (OR 8.6), being separated or divorced (odds ratio OR 8.8) and being particularly stressed in the last week (OR 8.7) were factors most likely to predict insomnia in a prison setting. Environmental factors including noise, violence, being in prison environment and conditions of prison were also identified as reasons for insomnia.
(Hughes & Boland, 1992). <b>USA</b> <b>Quality fair</b>	<b>Quantitative</b> Questionnaire/ canteen records.	<b>Setting:</b> Maximum security penitentiary <b>Demographics:</b> 144 male prisoners (mean age 34.0) <b>Sample:</b> Convenience	<b>Unstandardised measure</b> Several self-report 10-point visual analog questionnaires were used to collect information on the main variables (e.g. very poor vs. excellent sleep). <b>Reliability <math>\alpha</math></b> = not reported	<b>Main aim</b> To explore the relationship between caffeine consumption, nicotine and other factors including mood, anxiety and sleep problems. <b>Results</b> There was a significant interaction between cigarette smoke and caffeine use. Caffeine intake was particularly high in prisoners.	Prisoners who smoked and had high levels of caffeine intake had worse sleep than those who smoked less than 20 cigarettes a day and non-smokers.

**Key:** **GS:** Good sleepers; **PSQI:** Pittsburgh Sleep Quality Index; **OR:** Odds ratio

**Table 6**

*Theme 4: The prescribing of hypnotic medication<sup>8</sup>*

Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
(Elger et al., 2002). <b>Switzerland</b> <b>Quality poor</b>	<b>Quantitative</b> Comparative study Medical records	<b>Setting:</b> Outpatient facility of remand prison and medical clinic in community; <b>Demographics:</b> 179 prisoners (12.0% female; mean age 34.0) and 701 community patients (49.0% female; mean age 44.4) <b>Sample:</b> All participants that had a drug prescription in previous 3 weeks	<b>N/A</b>	<b>Main aim</b> Focus on the possible over prescribing of hypnotics and tranquillisers. <b>Results</b> Hypnotics and anxiolytics were the most commonly prescribed medication. Ten times more benzodiazepines were prescribed to men in prison than in the community. Results not explained by the high number of drug users in prison.	A significantly higher proportion of zolpidem, benzodiazepines or psychotropic medication was prescribed in prison where insomnia was diagnosed than in the community (23.5% and 4.1% respectively). This suggests that treatment patterns in prison are very different than in the general population.
(Elger, 2003). <b>Switzerland</b> <b>Quality fair</b>	<b>Quantitative</b> Prospective design. Questionnaire.	<b>Setting:</b> Remand prison <b>Demographics:</b> 52 prisoners (7.5% women; mean age 27.0) <b>Time:</b> T1 (10 days) T2 (2 months) <b>Sample:</b> Randomised	<b>Unstandardised measure:</b> "Insomnia" patients were counted if they asked for a consultation due to insomnia complaints or symptoms. <b>Standardised measure</b> PSQI (D. J. Buysse et al., 1989) <b>Reliability</b> $\alpha$ = not mentioned. However, taken elsewhere the Cronbach alpha reliability for the PSQI is .83	<b>Main aim</b> To determine whether self-reported sleep quality improves over time and which factors help improvement. <b>Results</b> Baseline total PSQI score was 12.8 and significantly improved in first two weeks (10.6) but PSQI scores remained clinically significantly despite medication.	Sleep quality most likely to improve in the early stages after medication is prescribed. Hypnotic medication only partly helped improve sleep quality. The majority of prisoners had higher PSQI scores over time suggesting that the longer prisoners are in prison, the more likely they will experience poor sleep quality.

Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
(Elger, 2004a). <b>Switzerland</b> <b>Quality fair</b>	<b>Quantitative</b> Retrospective design. Questionnaire/ Medical records.	<b>Setting:</b> Remand prison <b>Demographics:</b> 112 NSMI prisoners (90.2% male; mean age 30.9 years) <b>Sample:</b> Consecutive (see Elger, 2004a)	<b>Unstandardised measure:</b> "Insomnia" patients were counted if they asked for a consultation due to insomnia complaints or symptoms. <b>Reliability <math>\alpha</math></b> = not mentioned.	<b>Main aim</b> To examine how insomnia complaints are managed in a NSM prison population. In addition, to establish whether prisoners leaving prison have a prescription or need for prescribed medication. <b>Results</b> There was limited information about insomnia in the medical notes. But 111/112 of prisoners with insomnia were prescribed hypnotics (4/5 prescribed benzodiazepine or zolpidem).	More likely to be prescribed hypnotic medication in those who had partial or no improvement in insomnia symptoms. Just over half of this group left prison still prescribed hypnotics (e.g. benzodiazepines and zolpidem).
(Hassan et al., 2014). <b>UK</b> <b>Quality fair</b>	<b>Quantitative</b> Cross-sectional design. Medical records.	<b>Setting:</b> Four East of England prisons; <b>Demographics:</b> 2563 prisoners (13.3% female; aged 18+) and 280,168 from community (50.4% female; aged 18+) <b>Sample:</b> All participants with a prescription on census days	<b>Standardised measure</b> BNF chapters 4.1 hypnotics and anxiolytics (Joint National Formulary, 2013).	<b>Main aim</b> The author's intention was to ascertain the prevalence of psychotropic medication in a prison and community setting. <b>Results</b> The prevalence of prescription psychotropic medication in men and women was significantly higher in prison than in the community (19.6% and 44.0% compared to 5.4% and 11.1%).	Hypnotics and anxiolytics were five times more likely to be prescribed to men in a prison (6.4%) and eight times more likely in women (10.6%) than in their community counterparts (1.1% and 2.2% respectively).
(Hassan et al., 2013). <b>UK</b> <b>Quality good</b>	<b>Qualitative</b> Semi-structured interviews.	<b>Setting:</b> Prison <b>Demographics:</b> 17 patients (23.5% female; age range 19-52) and 16 staff; sex not stated) <b>Sample:</b> Purposive	<b>N/A</b>	<b>Main aim</b> To explore the prisoner and staff views of the psychotropic prescribing in a UK prison <b>Results</b> Psychotropic medication was used to help to reduce psychiatric symptoms but also for help coping and insomnia symptoms.	Staff suspect misuse and selling medication with sedative properties, which affects the management of insomnia in prison. Furthermore, psychotropic medicine other than benzodiazepines and z-drugs (e.g. zopiclone) are valued in prison because they help with sleep (e.g. antipsychotics).
(Reeves, 2012). <b>US</b> <b>Quality poor</b>	<b>Quantitative</b> Evaluation.	<b>Setting:</b> Prison <b>Demographics:</b> Not specified <b>Sample:</b> Not specified	<b>N/A</b>	<b>Main aim</b> To see whether the introduction of guidelines discouraging the prescription of benzodiazepine and quetiapine for insomnia would affect the actual prescriptions by GPs <b>Results</b> After 20 months the prescriptions of benzodiazepine	Implication that the reduction in discouraged prescribed benzodiazepine and quetiapine led to the referral to sleep hygiene groups and other non-pharmacological intervention.

Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
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reduced by 38% and after 22 months, the prescription of quetiapine reduced by 59%.

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**Key:** **BNF:** British National Formulary; **GP:** General Practitioner; **NSM:** Non-substance misusing; **NSMI:** Non-substance misusing with insomnia; **PSQI:** Pittsburgh Sleep Quality Index

**Table 7**

*Theme 5: Non-pharmacological treatment as a viable means of improving sleep<sup>8</sup>*

Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
(Abrams & Siegel, 1978). <b>USA</b> <b>Quality fair</b>	<b>Quantitative</b> Cross validation design Experiment	<b>Setting:</b> Maximum security prison <b>Demographics:</b> 89 male prisoners (age not specified. But 2/3 in 30's, 1/5 in late thirties and 1/5 over 40) <b>Groups:</b> TM 1 = 26, C1 14, TM 2 = 23 and C2 = 26 <b>Sample:</b> Not specified	<b>Unstandardised measure</b> Three questions: 1) For the past one or two months, it has taken me about this many minutes to fall asleep: less than ten minutes, between 10 minutes and half an hour or longer than half an hour 2) During the night my sleep has been deep without waking up, I have been waking up only once or twice in the night or my sleep is poor because I wake up many times throughout the night. 3) In general, over the past one or two months, my sleep has been getting easier and better, harder and more troubled or not much change or difference. <b>Reliability:</b> Not specified.	<b>Main aim</b> To examine the effects of meditation using the TM programme over time on various factors including sleep problems in a prison environment. <b>Results</b> The TM technique significantly reduced anxiety, hostility, neuroticism, poor behaviour and insomnia after 14 weeks.	The TM technique significantly improved the time it took to initiate sleep in less than 10 minutes (17% to 57%), deeper sleep with no waking (35% to 78%) and better quality sleep (22% to 74%) post meditation.
(Lutz, 1990). <b>US</b> <b>Quality fair</b>	<b>Quantitative</b> Quasi-experiment.	<b>Setting:</b> Jail <b>Demographics:</b> 40 male prisoners (aged 19-51 years) <b>Groups:</b> 20 in experimental and 20 in C (randomly assigned to each group) <b>Sample:</b> Not specified	<b>Standardised sleep measure</b> RCSQ (Richards, 1987). <b>Reliability</b> $\alpha = .82$ .	<b>Main aim</b> To investigate the impact of relaxation training on anxiety, sick presentation and sleep. <b>Results</b> The group trained in relaxation techniques experienced less anxiety, sick calls and sleep problems than the control group. However, this difference was not significant.	There was a significant relationship found between increased anxiety and decreased sleep before the relaxation technique was performed ( $r = -.66$ , $p < .001$ ).

Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
(Sumter et al., 2009). <b>US</b> <b>Quality fair</b>	<b>Quantitative</b> Experiment.	<b>Setting:</b> Detention centre <b>Demographics:</b> 33 female prisoners; age not mentioned. <b>Groups:</b> 17 in experimental group and 16 in C (randomly assigned to each group) <b>Sample:</b> No specified	<b>Unstandardised sleep measure</b> Sleep difficulties were established using only one question of the degree to which sleeping difficulties bothered them on a scale of 0 to 4.	<b>Main aim</b> To explore the relationship between meditation and several factors including sleep problems <b>Results</b> Overall, significant differences were found between pre and post stages in the experimental condition (meditation) on nail biting, desire to throw things or hit people and sleep difficulties.	Sleep difficulties were significantly less likely when meditation was utilised.
(Toler, 1978). <b>US</b> <b>Quality fair</b>	<b>Quantitative</b> Experiment.	<b>Setting:</b> Federal penitentiary <b>Demographics:</b> 24 male prisoners (mean age 26.8) <b>Groups:</b> PR = 9, PRSC = 9 and C = 9 (randomly assigned to each group) <b>Sample:</b> Convenience	<b>Unstandardised sleep measure</b> Insomnia was defined using a sleep log. After seven days, prisoners who took longer than 60 minutes to get to sleep, had at least one nightly awakening and were not on any medication for sleep problems were included in the study.	<b>Main aim</b> To compare PR (releasing tension from muscles), PRSC (tension release and controlling sleep routine) and delayed treatment C over two weeks to see if the former treatments could be an effective alternative to medication. <b>Results</b> Relaxation techniques helped to reduce poor sleep. However, there was limited improvement at 8 weeks.	The more complex relaxation and stimulus-control condition treatment group significantly lessened the number of nightly awakenings and time it took to go to sleep compared to the C. Furthermore, both treatment groups reduced state anxiety more than the control group.

**Key:** C: Control group; PR: Progressive relaxation; PRSC: Progressive relaxation/stimulus control; RCSQ: Richard Campbell's Sleep Questionnaire; TM: Transcendental meditation.



**Table 8**

*Uncategorised studies<sup>8</sup>*

Author/year/Country/Quality	Study design	Setting/Participants	Sleep measure/reliability	Main aim and results	Data related to insomnia
(Ihalainen, 1989). <b>Finland.</b> <b>Quality poor</b>	<b>Quantitative</b> Questionnaire.	<b>Setting:</b> County prison <b>Demographics:</b> 72 prisoners (age range 16-64 years; sex not stated). <b>Sample:</b> Not specified	No specific details given. <b>Reliability</b> $\alpha$ = not mentioned	<b>Main aim</b> No clear aim. <b>Results</b> There was a high amount of evidence of ego and superego and sleep disorders in prisoners that have committed serious crimes than other crimes.	Chi-squared tests revealed statistically significant differences on the use of sleep medication between prisoners who committed murder and other offences.
(Rogers et al., 2010). <b>US</b> <b>Quality fair</b>	<b>Quantitative</b> Secondary data analysis. Instrument validation.	<b>Setting:</b> Correctional centre referral and 100 treatment male prisoners (mean age of 33.9) <b>Sample:</b> Randomised emergency referral group and consecutive treatment group	<b>Standardised measure sub-section</b> Insomnia as a sub-scale taken from SADS-C (Spitzer & Endicott, 1978) <b>Reliability</b> $\alpha$ = .57	<b>Main aim</b> To establish validation of the SADS-C subscales and to explore the usefulness of SADS-C in assessing feign mental disorders. <b>Results</b> All four subscales (dysphoria, psychosis, mania and insomnia) had a good model fit. The measure was found to be an effective at predicting feigning symptoms of mental disorders.	Insomnia subscale had a moderate internal reliability consistency ( $\alpha$ = .57), which was less consistent than the other subscales. Significant association found between the insomnia subscale and the GAS (Endicott, Spitzer, Fleiss, & Cohen, 1976) ( $r=-.20$ ).

**Key:** **GAS:** Global Assessment Scale; **SAD-C:** the Schedule of Affective Disorders and Schizophrenia-Change Version;

**Theme 3:** *The negative influence of prison-related situational and environmental factors on sleep*

A range of prison-related situational and environmental factors was reported as negatively affecting sleep. Sleep was reported to be affected by factors such as light (Elger, 2003, 2009; Elger & Sekera, 2009); heat (Elger, 2004a, 2004b); isolation (Elger, 2009; Elger & Sekera, 2009); and noise (Elger, 2009; Lader et al., 2000; O'Brien et al., 2001; Singleton et al., 1998). In one study, prisoners with insomnia reported significantly more environmental noise (e.g. prisoner officers talking) three or more times a week than good sleepers (31.7% and 1.6% respectively) (Elger, 2009). As a consequence of incarceration, some prisoners also reported negative effects on sleep due to worry, guilt and judgement related to their crime (Elger, 2009; Elger & Sekera, 2009); prolonged imprisonment (Elger, 2009); and/or fear of violence (Elger, 2009; Mahmood et al., 2012). Moreover, insomnia was also associated with inadequate sleep hygiene including daytime inactivity (Elger, 2009) and/or high caffeine and nicotine intake (Hughes & Boland, 1992). No studies reported on the impact of bedroom set-up (e.g. mattress quality etc.) nor compared perceived sleep quality before and after incarceration. Some studies used a random sample and compared prisoners with insomnia and good sleepers (Elger, 2009; Elger & Sekera, 2009). However, the evidence was almost exclusively from Swiss remand prisons (i.e. unconvicted), the sample sizes were relatively low and thus some variables were positive for just one or two prisoners only. As a result, verification of these situational and environmental factors is questionable and needs further investigation in larger sample sizes.

**Theme 4:** *The prescribing of hypnotic medication*

Across the ten studies that examined how insomnia was managed in prison, hypnotic medication (i.e. zolpidem and benzodiazepines) was the most frequently mentioned treatment (Elger, 2003, 2004a, 2004b; Elger et al., 2002; Hassan et al., 2013, 2014; Reeves, 2012). In one study, hypnotic medication was given to the majority of prisoners who complained of insomnia (Elger, 2004a) or had self-reported poor sleep quality. In the three UK psychiatric comorbidity studies, hypnotic medication was more common in unsentenced rather than sentenced prisoners (Lader et al., 2000; O'Brien et al., 2001; Singleton et al., 1998). One study found that the proportion of hypnotic medication prescriptions increased over time when symptoms continued (Elger, 2003). Moreover, hypnotic medication continued to be prescribed following release from prison (Elger, 2004a). However, very few studies reported the indication for hypnotic prescriptions. This was particularly evident in those who were prescribed benzodiazepines. Consequently, it is not known whether the medication was prescribed for insomnia or another condition (e.g. anxiety) (Joint National Formulary, 2013). Furthermore, the gold standard method of evaluating treatments is a RCT (McGovern, 2001). However, no

RCTs were used to evaluate the effectiveness of hypnotic medication on insomnia in prison.

Prescription of hypnotics was found to be much higher in prison than in the community (Elger et al., 2002; Hassan et al., 2014; O'Brien et al., 2001), this was particularly evident for promethazine (i.e. a sedating antihistamine anecdotally known to be prescribed in prisons to aid sleep). The evidence for this finding was robust; one study found hypnotic and anxiolytic prescriptions in both men and women were significantly more likely in prison (6.4% and 10.6%) than in the community (1.1% and 2.2% respectively) (Hassan et al., 2014). A major strength of the study was the large sample size (n=2,563 prisoners across four different establishments, n=280,168 community patients). The study also accurately controlled for age and gender differences and represented different types of prisoner, albeit with an under-representation of prisoners spending short periods in custody. Other study flaws included the fact that diagnoses were not recorded and all the prisons were in one geographical region of the UK. Thus, generalisability would be affected by facts such as prisons in different regions of the UK or other countries may have different prisoner characteristics, pharmaceutical policies and/or local insomnia management arrangements.

In the same study, in addition to hypnotic and anxiolytics, the anti-depressant mirtazapine was found to be a particularly commonly prescribed drug in prison in comparison to the community (Hassan et al., 2014). The study's authors hypothesised that mirtazapine may have been a more frequent prescribing choice in prison due to its sedative properties. In the one wholly qualitative study included, healthcare staff described feeling pressured to prescribe psychotropic medication with a sedative component (Hassan et al., 2013).

In the one study that examined insomnia management practices by GPs (Elger, 2004a), insomnia was identified as only managed using medication, with no recourse to non-pharmacological treatments. For example, sleep hygiene education, CBT or sleep restriction were not reported as treatment options. It is possible that non-pharmacological treatments were offered but not recorded by clinicians, or the researchers chose to exclude this information. Conversely, there is a lack of evidence that shows that non-pharmacological treatment is being utilised for insomnia in a prison setting. In the first instance in the general population, clinicians usually attempt to manage insomnia using a non-pharmacological treatment option, a factor that may contribute to an understanding of the marked difference between the community and prison prescription rates for hypnotics.

***Theme 5: Preliminary indications that non-pharmacological treatment can improve sleep***

Four studies examined non-pharmacological treatment for insomnia in a prison environment (Abrams & Siegel, 1978; Lutz, 1990; Sumter et al., 2009; Toler, 1978), reporting that sleep problems were significantly reduced over time when meditation and relaxation techniques were used. For example, meditation significantly reduced the time needed to fall asleep (Abrams & Siegel, 1978) or the number of sleep difficulties over a period of fourteen and seven-weeks respectively (Sumter et al., 2009). In particular, combined stimulus control and relaxation techniques reduced the number of nightly awakenings after both two and eight weeks post-treatment initiation (Toler, 1978). However, in one study, relaxation training alone did not significantly improve sleep over two weeks (Lutz, 1990). It is possible that the difference in findings here was due to lack of monitoring in the frequency of the use of relaxation. All the experiments included a control group and enabled tighter control over the independent variables (e.g. permits cause and effect to be recognised). However, as with the lack of RCTs to establish the effectiveness of hypnotic medication, no RCTs were used to evaluate the effectiveness of non-pharmacological treatment on insomnia in prison. The experimental studies suffered due to small sample sizes across all experimental studies (n =24-89 only). The first community RCT of mindfulness meditation found it to be an acceptable form of insomnia treatment that reduces total wake time (Ong et al., 2014), however no evidence is available currently to indicate its success in a prison setting. Consequently, it is difficult to conclude that meditation and relaxation techniques improve insomnia symptoms in prison without using larger sample sizes, across countries and employing RCT methodology.

## **DISCUSSION**

The methodical approach used in this review has resulted in a cutting edge assessment of the prison related insomnia literature. Five main themes were yielded by the review; prevalence; co-morbidity, including the complex relationship between insomnia, anxiety, depression and substance misuse; the impact of situational factors and the prison environment itself; prescription medication; and finally, the possible impacts of non-pharmacological treatment options.

Insomnia and/or sleep problems were measured differently across all 33 papers, regardless of design. Methods used included insomnia consultations (Elger, 2003, 2004a, 2004b, 2009; Elger & Sekera, 2009); administration of sub-sections of standardised health assessments (Carli et al., 2011; Eytan et al., 2011; Feron et al., 2005; Harty et al., 2010; Ireland et al., 2005; Kjelsberg & Hartvig, 2005; Lader et al., 2000; O'Brien et al., 2001; Rogers et al., 2010; Singleton et al., 1998); subjective questions about sleep disturbance (Abrams & Siegel, 1978; G. V Hughes & Boland, 1992; Mahmood et al., 2012; Nessel et al., 2011; Sumter et al., 2009); identification of insomnia as a symptom of depression using DSM-III criteria (Kashani et al., 1980);

standardised sleep measures (Haghighat et al., 2014; Ireland & Culpin, 2006; Lutz, 1990); self-completed sleep diaries (Toler, 1978); PSG (Karacan et al., 1974); and, for one study, there was no obvious use of a measurement tool (Ihalainen, 1989). The use of objective measures including actigraphy (i.e. a wrist like device that measures awake and rest activity) and PSG were lacking or limited. Some studies used the PSQI or sleep diaries which are recommended measures for sleep and insomnia symptoms (D. J. Buysse et al., 2006). No studies used a recommended research measure to formally assess ID criteria and generate a clinical diagnosis (e.g. the taking of a clinical history for sleep disorders using the ICSD-2 criteria or research diagnostic criteria (RDC) (D. J. Buysse et al., 2006) or an insomnia-specific psychometric tool (e.g. the Insomnia Severity Index (ISI) (C. Morin, 1993) or Sleep Condition Indicator (SCI) (Espie et al., 2014).

The only previous review in this area looked at the evidence of “secondary insomnia” in a prison setting with particular reference to situational factors and then assessed the impact of insomnia upon professional management and outcomes. However, Elger’s publication (Elger, 2007) lacked clear evidence of the search strategy, search outcome and any study quality evaluation required to give the reader confidence that the review findings were reliable. In contrast, our integrative review provides a full breakdown of the search criteria with both inclusion and exclusion criteria, databases used and the processing of publications at all stages of the selection process. Moreover, whilst Elger (Elger, 2007) made reference to some limitations in the evidence, it was not clear what methodological standards were used to assess quality and whether they were used consistently throughout the paper. The current paper showed transparency in its evaluation of each study reviewed and an appropriate critical appraisal checklist was used to assess quality (Hawker et al., 2002).

There are a few limitations to this review. Firstly, non-English studies were not included in the review. This was because translation into English was not possible. Secondly, only the lead author was involved in the data extraction. Nevertheless, decisions on theme inclusion were discussed and refined amongst the author team. The authors were in agreement with the lead author. Thirdly, as our review was exploratory in nature, the research question was intentionally open. This could have affected the results. However, the authors felt the lack of a very focussed research question to be appropriate, as a complete overview of the insomnia-prison field was needed and lacking. This review now fills this gap. Almost 40 years ago insomnia was highlighted as a potential issue for prisoners (Toler, 1978), yet there is still limited evidence of research and, as a consequence, effective practice guidelines by which to measure and successfully treat insomnia, particularly using a recognised diagnostic manual or validated insomnia tool. This further highlights the need for future research in this area.

## CONCLUSION

This is the first integrative review to examine insomnia in a prison population. In conclusion, despite the publication of a number of scientific papers, rigorous research surrounding the prevalence, aetiology and management in a prison population is rare. Treatment decisions are frequently made more difficult in prison due to the prison environment and because prisoners with insomnia are more likely to have comorbid disorders which impact upon treatment options and likely efficacy. Furthermore, whilst a range of non-drug interventions have been found to be effective in treating insomnia in the community, there seems to be an emphasis instead towards prescribing medication as first line treatment in prison. However, the higher rates of prescribing may simply reflect higher rates of clinical need and may be entirely appropriate.

Notwithstanding methodological limitations, the literature to date indicates that sleep disturbance in prison populations is common, impairing, linked to greater levels of comorbidity, and treated using a limited range of interventions. While this is comparable in part to insomnia in the general/non-incarcerated population, data indicate that the burden of insomnia is considerably greater in prison, yet the management strategies employed are more limited. A series of studies is required to further characterise the nature, prevalence and aetiology of poor sleep in prison populations.

Future studies should aim to:

- Assess sleep with validated measures and prospective sleep diaries;
- Consider the use of objective measures (e.g. actigraphy and polysomnography);
- Conduct longitudinal studies to determine sleep quality/disturbance pre, during and post-prison stay;
- Assess qualitative reflections from prisoners about the nature of poor sleep;
- Establish what types of symptoms are most common (initiating, maintaining sleep, early morning awakenings) and how they impact on functioning/wellbeing and interactions with other prisoners/staff;
- How the prison environment impacts sleep and whether this differentially affects those of a particular age, gender, or chronotype (i.e. morning/evening);
- Inter-relations between substance misuse, comorbidity and poor sleep;
- Determine best practice around prison-based prescription of hypnotics and assess the application and delivery of non-pharmacological options;
- Establish environmental/operational factors that may facilitate/hinder sleep; and,
- Conduct randomised, controlled evaluations of insomnia treatment options.

It is important to further study insomnia within a prison population in order to identify an accurate rate of prison insomnia; improve staff-prisoner relationships with regards to

treatment consultation and satisfaction; to provide effective insomnia management in a prison environment; and to reduce the negative effects of insomnia and their impact upon an individual prisoner's ability to engage with restorative, reparative and rehabilitative activities in prison to increase their life chances upon release.

#### **Practice points**

1. Overall the evidence currently does not provide reliable estimates of the prevalence of insomnia in prison other than that it is at least as common, and likely higher, than in the general population. Sleep problems seem to be more common in women than men in line with the general population evidence.
2. There is a lack of evidence regarding the most effective ways to treat insomnia in prison.
3. In line with the general population, depression, anxiety and substance misuse are significantly associated with insomnia in prison.
4. There is some evidence that hypnotic medication; relaxation and meditation can help to improve insomnia symptoms in a prison setting. However, some prisoners' insomnia symptoms still remain despite any one of these treatments.
5. It is hard to draw firm conclusions from the current research literature. While some papers were of good quality, quality ratings in relation to study design and conduct were generally low. Studies were often apparently underpowered, few had a control arm, and many employed non-validated measures.

#### **Research agenda**

1. An accurate prevalence rate for prison insomnia in men/women and younger/older prisoners, both with and without comorbid conditions, has not been established in UK or USA prisons. This is important to capture as this knowledge can then impact on ability to commission and provide the right amount and type of treatment needed.
  2. A direct comparison between the general population and prison populations of insomnia prevalence (e.g. gender, age etc.), associated factors and how it is managed needs to be researched, including considerations of how long term insomnia may affect a prisoner's ability to lead a productive life upon release.
3. Future research should use only valid, reliable and standardised insomnia assessment tools in order to provide generalisable results that can be used in positively influence management practices in prisons.

## **2.6 Why is it important to study insomnia in a prison population?**

Insomnia is a common problem in prison. The prison environment can impact upon a person's sleep routine, quality and quantity more than in a non-custodial setting (Collier et al., 2003; Donaldson & Chintapanti, 2009; Frighetto et al., 2004; Haynes, Parthasarathy, Kersh, & Bootzin, 2011; McCall, Rebossin & Cohen, 2000). This may be because prisoners have limited autonomy and restricted routines that force them to share confined spaces, with little control over their environments. Furthermore, prisoners are also more likely to have psychiatric disorders, substance misuse problems or be on medication, all of which can add to an already difficult environment for encouraging sleep.

Insomnia is an important public health problem (CDC, 2016). Individuals with insufficient sleep are more likely to experience poor mental health including low mood, depression, anxiety and suicidal behaviour. Suicide is four times more likely to occur at night, a time when prisoners are locked down, and staff are limited, therefore regular checks are reduced (Perlis et al., 2016). Being awake at night may therefore represent vulnerability for completed suicide in prison.

Sleep problems in prison can also cause multiple problems to an individual's wellbeing, productivity and rehabilitation. Ultimately if an individual is unable to engage with the prison regime, because of insomnia, this may impact on their wellbeing and jeopardise the success of rehabilitative programs. It may also threaten the security and safety of the prison due to increased agitation, disturbances and illicit trading of sedative drugs. For example, recent studies have found significant association between insomnia and aggression (Barker, Ireland, Chu, & Ireland, 2016; Kamphuis, Dijk, Spreen & Lancel, 2014; Kamphuis, Meerlo, Koolhaas, & Lancel, 2012). Disturbed sleep is accompanied by emotional instability such as a great irritability and short-temperedness. Whilst most people do not experience resultant physical outbursts of aggression, this may be different in a vulnerable group, such as prisoners. If poor sleep is a risk factor for aggressive behaviour and suicide (Bernert & Nadorff, 2015; Kay et al., 2016) then understanding more about the complexities of insomnia in a prison setting, including promoting good sleep and treating insomnia, would seem to be a logical and beneficial step as part of wider attempts to prevent low mood, aggressiveness, and even self-harm and suicide.

Whilst insomnia seems to be a common complaint among prisoners, formal research surrounding the prevalence, aetiology and management in a prison population is rare. Substance misuse, the prison environment and psychiatric disorders have been identified as possible reasons for insomnia among prisoners. However, no UK based studies have attempted to specifically investigate the prevalence of insomnia in prison,



in the context of these wider factors. Therefore, it is difficult to ascertain the true prevalence rate for insomnia among people in UK prisons and to identify potential associations with wider clinical, demographic and environmental factors. This is important to capture as both the nature and scale of the problem, which will impact on the amount and type of treatment that is needed.

General guidance is available (e.g. NICE), but guidance that is prison specific is limited. Prison specific factors (e.g. security and medication issues) complicate treatment of insomnia in prisons. Staff-prisoner relationships are complicated and there seems to be a mutual distrust, which can affect day-to-day life of both parties. We don't understand the current state of management practice of insomnia in prisons. There are suggestions that current state of affairs is not optimal, therefore, there is a need to understand situation better and develop this to understand how to move forward with a better approach. In order to do this, we need to know the scale of the problem, what is causing the problem and what can be done to manage it more effectively. My research should help to increase awareness on the importance of adequate sleep, debilitating effects of insomnia for prisoners and help to promote good sleep health in prisons as part of the overall public health agenda.

## **2.7 Study aims and objectives**

The overall aim of this study is to explore the area of insomnia in prisons and consequently develop and produce an assessment, diagnosis and treatment pathway of care of insomnia in prisons that is acceptable to both prisoners and staff.

To achieve this goal, the objectives and hypotheses of this study are:

- To establish current practices in insomnia management in prisons in England and Wales.
- To determine the prevalence of insomnia in male and female prison populations.

*Null hypothesis: There will be no significant difference between male and female prisoners on insomnia.*

- To assess the difference between those with and without insomnia on a number of clinical, environmental and situational factors associated with insomnia in prison

*Null hypothesis: There will be no significant difference between those with and without insomnia.*

- To explore both prison and healthcare staff and prisoners' attitudes towards the management of insomnia in prison.
- To develop and produce a "gold standard" pathway tool that will improve the assessment, diagnosis and management of insomnia in prison.

## Chapter 3 Methodology

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This chapter provides an overview of methodological considerations for this mixed methods thesis. Rationales for the discrete worldviews, methodological approaches and methods of data collection for each study are discussed. Additional methodological details for **studies 1-4** are provided within each results paper.

### 3.1 Research paradigms

The debate about the superiority of quantitative or qualitative research methods is enduring. Different epistemological foundations, ontological positions and the role of theory in relation to research underpin both methods (Creswell, 2009; Lincoln & Guba, 2000). Decisions influencing the choice of appropriate methods of data collection subsequently derive from these philosophical platforms.

#### 3.1.1 *Quantitative research*

Quantitative methodology mainly uses a deductive approach that centres on positivism and objectivism (Slife & Williams, 1995). Positivism is a philosophical worldview that claims the world is peripheral to a single objective reality to the truth in any situation, regardless of individual perspectives (Feilzer, 2009). Knowledge is therefore created by retaining objectivity, rationality and precision. The post-positivist worldview takes this one step further and implies that the truth does not need to be physically observed. Post-positivism has arguably replaced positivism (Clark, 1998). From a post-positivist perspective, truth is approximate, but more likely unattainable. This idea is built into testing theories and hypotheses using a logical methodological approach. For example, knowledge is never proven, but hypotheses are repeatedly tested (and disproven), in an effort to get closer to valid knowledge. Experiments, longitudinal studies and surveys are common methods of data collection in post-positivist research.

#### 3.1.2 *Qualitative research*

Qualitative research can centre on interpretivism, which directly opposes positivism. Interpretivism uses an inductive stance, has a relativist ontology and a subjective epistemology (Creswell & Clark, 2011). Ontological relativism argues knowledge is relative to circumstance and experience; that there is no universal truth as “truth” comes from multiple realities (Levers, 2013). From the perspective of interpretivism, knowledge is inherently subjective, gained through the filtered lens of the observer’s individual personal characteristics such as gender, ethnicity, race, class and employment status (Lincoln & Denzin, 2005). Different methods are used, including participant observation, ethnography, focus groups and interviews.

### 3.1.3 *Pragmatism*

The pragmatist worldview centres on the research problem and subsequent consequences of answering the research question (Creswell & Clark, 2011; Denzin, 2012). Pragmatism accepts both post-positivist and interpretivist views; that the nature of reality is from both a singular and multiple perspective (Creswell & Clark, 2011). For instance, researchers aim to test hypotheses from their single reality but, to achieve this, acknowledge the existence and value of different perspectives, such as staff and patients. Pragmatism also uses integrative logic, linking quantitative with qualitative research, without pinpointing a restrictive methodological direction. This sense of flexibility and openness to unexpected data embodies mixed methods research. Indeed, the support for pragmatism as the foremost paradigm for mixed methods research is evident (Tashakkori & Teddlie, 2010).

### 3.1.4 *Rigour*

Rigour is a concept defined as being extremely thorough and detailed to ensure trustworthiness (Oxford Dictionary, 2017). Rigorous findings are essential to ensure they can inform practice, policy and service delivery. Achieving rigour in quantitative research is usually achieved by demonstrating validity, reliability and generalizability (Green & Thorogood, 2009; Noble & Smith, 2015). Historically, rigour has been considered in relation to quantitative research but discussions relating to rigour in qualitative research have become increasingly commonplace and understood as equally important. Consequently, a debate about the appropriateness of using equivalent quality criteria for qualitative research as for quantitative research was presented.

Many academics feel qualitative research should not be critiqued against the same criteria as quantitative research because of the different philosophical underpinnings (see sections 3.1, 3.1.1 and 3.1.2). Therefore, different terminology is assigned within the qualitative research arm to evaluate rigour whilst remaining equivalent to quantitative terminology in their intention. Lincoln and Guba proposed some of the original criteria to assess quality in qualitative research, comprising: credibility, dependability, confirmability and transferability (Lincoln & Guba, 1985). However, no consensus exists on which evaluative criteria for qualitative work should be used (Leung, 2015) as there are many additional alternative criteria, standards and/or considerations that can be used to evaluate studies (Ballinger, 2006; Lincoln & Guba, 1985; Mays & Pope, 2000; Meyrick, 2006; Tracy, 2010). However, Lincoln and Guba's standards are longstanding, frequently used, recommended and accepted by many qualitative researchers. In addition, there is direct linkage to quantitative quality criteria stated earlier and the standards have been applied to qualitative research across a variety of academic fields including healthcare and prisoner research (Grondahl, Wilde-Larsson, Karlsson & Hall-

Lord, 2013; Walker, 2013). It is for these reasons I have chosen to use these criteria in the context of this thesis. To ensure adequate attention is given to each criterion they are described individually.

#### 3.1.4.1 Credibility

Achieving credibility will mean results are convincing to the reader (Lincoln & Guba, 1985). Credibility can be helped by employing several strategies. For example, triangulation is a well-accepted method in qualitative research that uses multiple data resources to address the same research question. Other strategies include acknowledging participants' opinions on initial themes that could add to the truth value; identifying the most common viewpoint and highlighting views that refute the majority; and considering multiple perspectives (Noble & Smith, 2015). Consideration of the researcher's role in the final themes (reflexivity) is also a good way of achieving credibility (Creswell & Clark, 2011; Green & Thorogood, 2009).

#### 3.1.4.2 Dependability

Dependability in relation to qualitative research is defined as having a consistent research process (Lincoln & Guba, 1985). Therefore, evidence of how conclusions have been drawn about data is needed to demonstrate consistency. Sometimes this is difficult; subjectivity is a common criticism of qualitative research because the process involves individual interpretation of what another individual has said or meant and that may be influenced by their own biases/experiences. However, a step towards achieving dependable findings can be achieved by showing transparency, providing a clear audit trail showing the methodology employed and steps taken to establish the final themes (Green & Thorogood, 2009; Noble & Smith, 2015; Rae & Green, 2016). This is important so that the reviewer has confidence the main themes would be similar if the analysis was repeated by an independent person. Strategies that can help achieve dependable research may include having multiple coders, providing several quotes to back up themes, showing transparent and open data and being reflexive about decisions, challenges and issues during data collection.

#### 3.1.4.3 Confirmability

Confirmability refers to the quality of research findings that is free of bias (Diebel, 2008; Lincoln & Guba, 1985). In all likelihood, the possibility of findings without human influence is unlikely, thus being open about the researcher's potential bias is paramount. A possible approach to achieving this is by having open and regular discussions with the research team, and having multiple coders (Noble & Smith, 2015).

Table 4: Rigour criteria, strategies and examples of thesis intention

<b>Rigour criterion</b>	<b>Strategy to demonstrate rigour facet</b>	<b>Thesis intention</b>
Credibility	Acknowledge that truth comes from multiple perspectives	Include a selection of interviewees with a range of disciplines and perspectives such as service users, staff involved with mental health care and substance misuse
	Be reflexive	Acknowledging role of researcher in theme decision process
Dependability	Multiple coders	Second person codes a selection of the transcripts
	Reasons for each code/theme evident	Back up each theme with a selection of quotes Complete a reflexive diary throughout data collection period.
Confirmability	Credibility, dependability and transferability are attempted	Try to encompass thesis intentions from all other facets
	Scrutiny of data	Record potential issues throughout research process. (e.g. problems with unity between research aims, methodology and results) Audio record interviews to revisit interview and make sure true understanding is maintained Initial themes to be discussed with research team.
Transferability	Consideration of findings to other establishments and other people is made	Discuss how applicable results might be to other prisoners and other prison types and implications.

#### 3.1.4.4 Transferability

Attaining transferability is to consider how findings would apply to other participants and settings, which is similar to generalisability in its intention (Lincoln & Guba, 1985). Some consider transferability difficult to achieve in qualitative research because of the small numbers of participants routinely involved and the sometimes temporary nature of findings. In contrast, others suggest it is possible, achievable by understanding the probable meaning of the results from an individual viewpoint (Cziko, 1989; Graneheim & Lundman, 2004). Strategies to critique transferability include providing participant demographic information and rich detail of setting, selection of participants and context of findings (Graneheim & Lundman, 2004; Myburgh & Poggenpoel, 2007).

#### 3.1.5 Reflexivity

Reflexivity is embedded in qualitative research, allowing the researcher to reflect on how their personal position, background and experiences may have impacted on their study (Tufford & Newman, 2012). It is less common for reflexivity to be addressed in purely quantitative research studies. Potentially, some may think that the objective stance used in quantitative methods suggests knowledge is possible without considering subjective perspectives (Lipp, 2007). Therefore, from a quantitative researcher's standpoint, the identity of the researcher has no influence on the result and reflexivity is therefore irrelevant (Ryan & Golden, 2006).

In the context of the current study, I felt that it was important to reflect on my role and prior assumptions, particularly within a mixed methods study where qualitative and quantitative findings are integrated (Walker, Read, & Priest, 2013). Having a reflexive stance is important in order to reflect analytically about how a study is conducted and how one's own actions throughout the research process may have influenced the results (Creswell & Clark, 2011). Adopting such a transparent approach serves subsequently to give a reader increased confidence in the findings (Patton, 2002). This reflexive approach can be evidenced by being aware of four areas: methodological openness, theoretical openness, the social setting of the research itself and the wider social context (Green & Thorogood, 2009). I showed awareness of all areas in my work and will now reflect on each and how I addressed them.

##### *Methodological openness*

From the study outset I knew I had to be consciously aware about how I was going to collect my data and how each methodological decision could impact upon on my results. To reflect this, I was explicit about each step I had taken and recorded each new

methodological decision that happened throughout the course of each study using a reflexive diary. Here's an extract of how a recorded methodological decision:

[14/04/2014]

*"In my recent supervision meeting it was relayed to me that my provisional number of women with insomnia was quite high in relation to previous research. They had suggested that I have a consultation meeting with two researchers based at HMP New Hall to discuss potential reasons for the high numbers. Best practice in conducting structured interviews was discussed; specifically that the interviewer should follow the format of the questionnaire and to be aware of manipulation from the prisoner interviewee. In other words, the women may have been overestimating their symptoms and that's why the numbers were high. Today in my meeting we was decided that one of the researchers should observe me in practice conducting an interview".*

[date not known]

*"Today I had an interview observed. I was aware of several things that made my expectations of the interview as clear as possible for the participant. I repeatedly told the participant about the time-period I was looking at; I made it clear that I wanted to know about their sleep and anything else they wanted to talk about we could talk at the end, and I also kept to the questions detailed in the questionnaire only. I was aware it was not a semi-structured interview where participants could expand on their answer. Thus, a structured interview should keep to the questions stated only. The researcher feedback was positive. I continued interviewing participants in this manner".*

I then used this diary to form my discussion of each study, including limitations and things that could have influenced my results. At the outset, I was also aware of the alternative types of method, design or approach for each study. There is more detail on this in section 3.3 on page 101-120.

#### *Theoretical openness*

I had a reflexive awareness of the theoretical assumptions that I brought with me before I started the PhD project. Two previous masters dissertations were theory driven and were based in psychology theory. Non-pharmacological treatment in the context of insomnia are driven by cognitive and behavioural psychology (Behaviourism) and were embedded in my thinking before I started the PhD. For example, I had a strong belief in treating mental disorders with non-pharmacological alternatives such as psychological therapies, I feel I may have been easily persuaded to the strength and place of these therapies over medication. My belief was later strengthened by the many discussions I had with sleep researchers who promoted CBTi as part of their standard treatment



practice for insomnia. Thus, it is possible this belief impacted my work and potentially altered my findings. Nevertheless, my thinking was challenged throughout my PhD. This was evident particularly from academic supervision and service user consultation groups. For instance, one supervisor, made several claims that medication had a place in the treatment of insomnia and I needed to acknowledge this in both my discussion, papers and final pathway. Furthermore, during supervision meetings I offered my point of view on various matters such as the pathway format, content and layout, where supervisors replied with alternatives. The team contributed with hands-on clinical and service delivery experience, which I did not have, meaning different influences were captured to ensure variability in discussion.

#### *Awareness of the social setting of the research itself*

Data can be produced from the interaction between the researcher and participant (Green & Thorogood, 2009). Consequently, awareness of this interaction is needed to accurately reflect how the data are produced. My interaction with prisoner participants changed as I went through each interview and spent more time in the prison; becoming more of a familiar face from outside the prison. I was aware how my status may have affected my interviews. I felt most prisoners saw me as an 'outsider', broadly considered as someone who was not authoritarian, could not make decisions about their care and a neutral person. I came to this conclusion because prisoners from the outset were very receptive towards me and specified that they understood I couldn't give them treatment but they wanted to tell me about their experience with poor sleep treatment anyway. It's possible they therefore felt they could "offload" about their experience of sleep in prison and other prison-related issues without fear of consequences. They wanted to talk to me. This openness allowed for detailed answers to each interview question and therefore gave substance to each general theme. However, on reflection the results may have been different and perhaps less honest, if they had seen me in the same light as healthcare or prison staff where the power relationship is in favour of the member of staff. One prisoner in particular responded to me in a noticeably differently manner. He was educated and spent a lot of time talking about his degree and life before prison. There was a sense he felt there was an equal power balance between the prisoner and staff and he saw me in the same light as the staff; authoritarian. Therefore, he acts like he did with the staff and acted like he didn't need to answer my questions. Although he agreed to take part in the study he was reserved and did not open up as much as the other participants. Nonetheless, overall, having the status of an 'outsider' influenced my results, as it gave me a unique opportunity to record open and detailed viewpoints that otherwise may not have been heard by an 'insider' (healthcare or prison staff).

#### *Awareness of the wider social context*

Social, political and contextual factors can impact upon analytical decisions and reasons for inclusion and exclusion of themes. Prisoners for the semi-structured interviews (**study 3**, page 154) were recruited in part from the quantitative survey prisoner sample (**study 2**, page 136). One contextual factor was that I was aware that they had pre-existing sleep problems and/or experience of insomnia treatment in prison who may have had an established desire to raise negative experiences with insomnia management in prison that would answer only some, but not all, objectives of the study. Consequently, I decided the best way to manage the situation if it arose would be to make the purpose of the study clear at the start of the interview. Furthermore, I emphasised that I wanted to know about both the positive *and* negative experiences of insomnia management in prison.

Another aspect of personal reflection regarding the wider social setting was my belief that prison is an opportunity for personal rehabilitation and an opportunity for health improvement rather than as a punishment. For example, some prisoners do not access healthcare services outside of prison, therefore I feel prison is a chance to engage prisoners in these services which can improve their health. It is possible these beliefs influenced the production of some of the themes in **study 3**. For example, one theme, “perceived consequences of poor sleep” could have been influenced by my opinion of the prison system as I may have been looking for things that emphasised this belief, specifically how there is value in sleep in prison and how good sleep can help prisoners with improving physical and mental health and rehabilitation.

### 3.2 Mixed methods approach

The main aim of the thesis was to produce a treatment pathway for insomnia in prisons. In order to achieve this, evidence was required regarding the scale, variability, causes and subjective experience of insomnia in prison. This necessitated a mixed methods approach considering both service user and staff perspectives of insomnia treatment. Taking such an approach, positioned in pragmatism, allowed me to capture the nature and scale of insomnia and its treatment fully. Employing quantitative or qualitative approaches alone would have been limiting.

Mixed methods have been used to inform the development of care pathways in health services research and specifically in the criminal justice system (Allen et al., 2012; Hughes & Hasselaar, 2014; Noga, Walsh, Shaw, & Senior, 2014). For the current study, there are several mixed methods approaches that could have been chosen including multiphase, convergent, exploratory, explanatory and embedded. Due to the nature of the particular research questions of this study, the multiphase mixed methods approach was deemed the most appropriate and was chosen for overall study framework.

The chosen approach, a multiphase design, goes further than simply including discrete qualitative and quantitative approaches at different stages of the research process. Multiphase designs are adopted to provide solutions to complex problems, by undertaking several studies sequentially, each of which builds on previous stages (Creswell & Clark, 2011). In this case, the *problem* was that whilst insomnia seemed common in prison, there was no existing standardised care across the prison estate. The *solution* was to produce a standardised treatment pathway for insomnia in prison. To achieve the solution, following a systematic review of the literature, four strands of inquiry were undertaken (Figure 3). Firstly, the aim of **study 1** was to establish current practice of insomnia management in England and Wales' prisons. Secondly, **study 2** aimed to ascertain prevalence and associated factors of insomnia in prison. Thirdly, staff and prisoner perspectives regarding insomnia management were sought to better understand prisoner engagement with staff regarding their sleep problems and to explore potential the future direction of insomnia management in prison (**study 3**). Lastly, the aim of **study 4** was to integrate findings from **studies 1-3** to produce a treatment pathway for insomnia in prison.

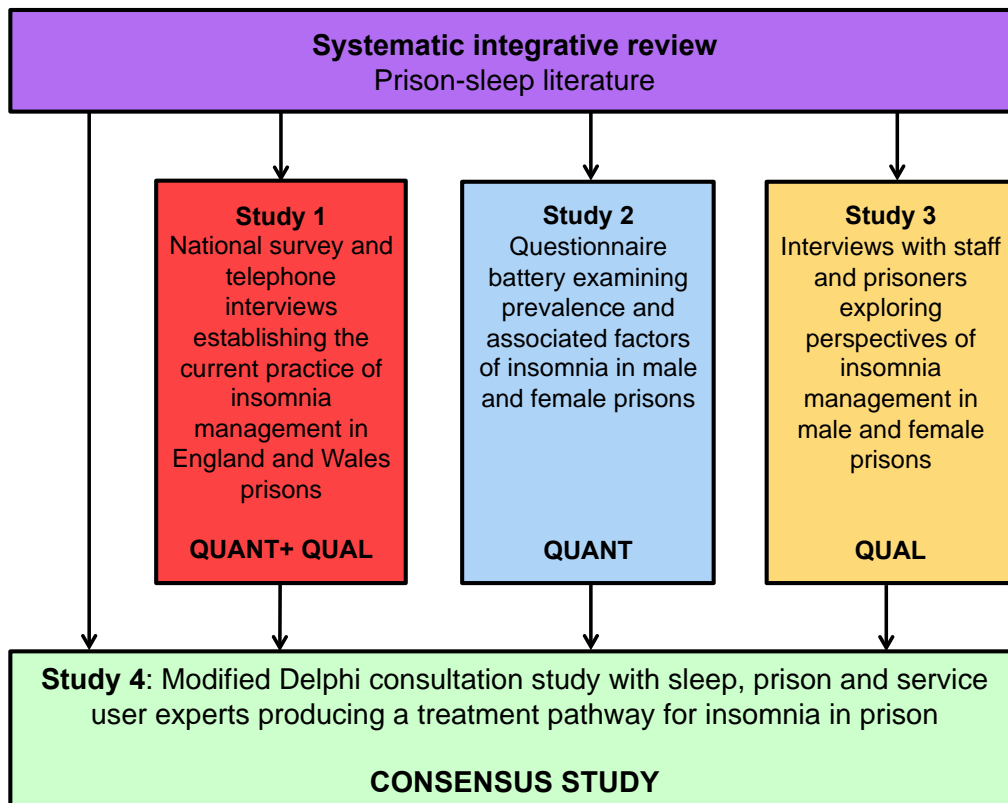


Figure 3: Mixed methods approach

Table 5 shows how quantitative and qualitative methodologies were incorporated across each study, as well as an overview of the individual studies.

Table 5: Overview of study objectives, approaches and methods

Study	Objective	Approach	Method	Sites
1	<ul style="list-style-type: none"> <li>To identify how insomnia is detected, diagnosed and managed in prisons in England and Wales</li> </ul>	Quantitative and qualitative	National survey and telephone interviews	84 prisons in England and Wales
2	<ul style="list-style-type: none"> <li>To understand more about sleep problems and insomnia in prison populations compared to the general population</li> <li>To distinguish between the prevalence of insomnia in male and female prisoners</li> <li>To understand the associations between insomnia in prison and demographic, clinical and environmental characteristics</li> </ul>	Quantitative	Cross-sectional structured interviews	1 female prison, 1 male local and 1 male training prison across Northern England
3	<ul style="list-style-type: none"> <li>To explore both prison and healthcare staff and prisoners' attitudes towards</li> </ul>	Qualitative	Semi-structured interviews	1 female prison, 1 male local

	the management of insomnia in prison.	with staff and patients	and 1 male training prison across in North England N/A
4	<ul style="list-style-type: none"> <li>▪ To develop a “gold standard” pathway tool that will improve the assessment, diagnosis and management of insomnia in prison.</li> </ul>	Controlled consultations using Delphi technique	

### 3.3 Methodological considerations

In this section, the methods of each study are discussed in detail. Care has been taken to avoid repetition of content found elsewhere in papers.

#### 3.3.1 Study 1

This section covers the rationale for using survey collection and telephone interviews. Specific detail in relation to the recording, transcription and analysis of interview data is presented under **study 3**, a study with wholly qualitative methodology.

##### 3.3.1.1 Mixed methods design

A survey and telephone interviews were completed to establish the current practice of insomnia management in prisons. The telephone interviews were used to further contextualise the survey results.

##### 3.3.1.2 Survey data collection

Questionnaires were used to identify how insomnia is currently managed in prisons in England and Wales. Questionnaire surveys offer a number of advantages. Data collection can target large samples over a wide geographical area; furthermore, questionnaires are generally cost efficient and, if well-designed, simple to complete (Kelley, Clark, Brown, & Sitzia, 2003). Several different options for administering surveys were considered including online and paper-based methods. Based on past experience trying to find the name and individual contact details of each healthcare manager was not considered time efficient due to difficulties contacting prisons and their general unwillingness to divulge such information to ‘cold callers’. However, the role of the healthcare manager is universal among prisons; there is someone in every prison who would identify with this job title; thus, if addressed to the ‘healthcare manager’, the questionnaire would be very likely to be directed to the intended person, first time round. Furthermore, it was not possible to rely on online survey tools being accessible because of various NHS and HMPS security filters in operation across a range of IT systems. In

addition, as most of the names and email addresses of current healthcare managers were unknown, sole reliance on online survey methods was not possible as these would have necessitated access to individual email addresses. Therefore, postal surveys were sent to all adult prisons addressed "For the attention of the healthcare manager". Follow-up emails and telephone calls were implemented vigorously to maximise response rates. Ultimately, data collection was achieved through a range of methods, including post, email, online and telephone.

### 3.3.1.3 Telephone interviews

Telephone interviews were conducted with staff to collect more in-depth data about current insomnia management practices in a purposive sub-sample of prisons. The sample was selected according to their questionnaire responses, including a range of prison types and incorporating prisons with a) more structured and b) less well developed approaches to insomnia management.

Questionnaires allowing unlimited free text answers and both face-to-face and telephone interviews were considered. I felt open-ended questionnaires would not capture the focused data that was needed, risking irrelevant answers or misinterpretation of questions in a situation without possibility of further follow up questions to clarify responses. Face-to-face, rather than telephone, interviews have previously been identified as more suitable for the discussion of sensitive topics (Sturges & Hanrahan, 2004); however, the topic under discussion here was not considered sensitive and thus telephone interviews were considered as a possible option.

Telephone interviews offered several logistical advantages. **Study 1** took place concurrently with **study 2**. **Study 2** was time-consuming, labour intensive and involved constant travel to three prisons across different geographical locations. Therefore, telephone interviews were a convenient and flexible method that could be integrated effectively into the researcher's schedule. Furthermore, they were considered suitable for groups who have busy schedules, such as healthcare staff. A further advantage of telephone interviews when interviewing prison staff is that their conduct does not involve the completion of the security vetting process required to visit an establishment in person, thus saving on repeated administrative tasks. At times staff were very difficult to catch on the phone, thus persistence was key to achieving the required number of completed interviews. Nonetheless, telephone interviews do have disadvantages and these were also considered. Some researchers believe telephone interviews are inferior to face-to-face methods because it is more difficult to develop rapport and the effective use of body language signals is hampered (Novick, 2008). Moreover, telephone interviews are deemed most satisfactory for short, structured interviews (Harvey, 1988; Fontana and Frey, 1994). Overall, telephone interviews were considered appropriate

because they made effective use of time and the format was suitable for the expansion of a non-sensitive topic already introduced to the respondent via the questionnaire.

### 3.3.2 *Study 2*

#### 3.3.2.1 Research design

**Study 2** was conducted to identify the prevalence of insomnia in both men and women and determine the main predictors of insomnia in prison. Due to the paucity of literature on insomnia in prison, taking a cross-sectional point prevalence approach was identified as an appropriate first step to better understand the scale of the problem in prison. Several research designs were deliberated including cohort and cross-sectional studies. Cohort studies are generally considered superior to cross-sectional studies as they can be used to ascertain causality of a condition, which was directly related to the study objective. In contrast, cross-sectional studies only establish an association, not causality (Sedgwick, 2014). Furthermore, cohort studies are normally used to measure incidence rather than prevalence (Mann, 2003). Nonetheless, cohort studies require examination over a (sometimes long) period of time, which was not possible because of study time restrictions. A cross-sectional point prevalence design provides observations at one point in time in a quantifiable manner and are identified as the best design to determine prevalence (Creswell, 2003; Mann, 2003). In contrast to cohort studies, cross-sectional studies are easy to administer, relatively cheap and quick to perform (Mann, 2003; Sedgwick, 2014). An alternative design is the period prevalence study. Period prevalence studies are very similar to point prevalence studies, but they measure prevalence over a set time period (e.g. 12 months). This study design would have been difficult to implement in prison establishments where prisoners regularly move between prison and the community and between prisons themselves, making follow-ups very difficult. Furthermore, because of the high turnover, it would have been difficult to obtain appropriate denominators to calculate accurate prevalence estimates. After consideration of different research designs, the cross-sectional design was chosen because it is the most appropriate design to measure prevalence, can be conducted in a limited timeframe and was chosen therefore to examine both prevalence and associated factors.

#### 3.3.2.2 Measuring insomnia

The “gold standard” method of diagnosing sleep disorders is to use PSQ (Reite, Buysse, Reynolds, & Mendelson, 1995). PSG is a method of monitoring sleep using electrodes that are placed on the scalp. This method is typically used in clinical settings for individuals, rather than for large samples for research purposes. Additionally, it is self-evident that it would have been extremely difficult to connect sets of electrodes to large numbers of prisoners overnight in individual cells. It is also likely the PSG would not

have been permitted in a secure environment of a prison. Furthermore, I did not have the resources to conduct a PSG study in prison.

Sleep diaries are considered an acceptable alternative to polysomnography as they are easily administered, can capture sleep problems and are cost effective (Bastien, Vallieres, & Morin, 2001). However, sleep diaries rely heavily on consistent and accurate personal completion, which can be difficult in the stressful environment of the prison because of distractions, lack of concentration and commitment to the task and likely reduced levels of literacy. However, importantly, neither PSG nor sleep diaries specifically incorporate the insomnia criteria of any diagnostic manual, making them difficult to use in isolation.

Several previous studies have used medical records to examine prevalence of insomnia (Elger, 2004a, 2004b; Eytan et al., 2011; Feron et al., 2005; Kjelsberg & Hartvig, 2005). A key advantage of using medical records is the ability to collate data over a large number of sites. However, medical records are a possible source to ascertain insomnia symptoms (and other condition symptoms) but can be unreliable as there is little standardisation at both an intra-relational (across patient) and inter-relational level (across prison). Furthermore, information recorded in patient records is dependent on clinician skills and experience and has inconsistent quality between clinicians (Feron et al., 2005). Establishing insomnia symptoms through records is also dependent on everyone with symptoms *reporting* symptoms and those symptoms then being recorded accurately. Anecdotal evidence suggests that insomnia is often undisclosed by prisoners and therefore could be under diagnosed by prison healthcare staff. Consequently, it is difficult to judge the accuracy of any prevalence estimates of insomnia in a prison population based solely on clinical records. To avoid these issues **study 2** identified insomnia in prison using self-report questionnaires administered by an interview to a random, non-clinical sample of the general prison population.

Several different structured, self-report measures have been used previously to assess insomnia across different populations in both research and clinical practice (see Table 6). These have the advantage of being validated on large samples and are based on diagnostic criteria from relevant clinical manuals. All existing sleep measures identified during the background research and considered for use in this study (see Table 6) have good reliability. Overall the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989) was considered most suitable to assess insomnia symptoms in this population, having been previously used successfully in a prison environment (Buysse et al., 2006; Elger & Sekera, 2009). However, it lacks specificity and assesses sleep quality, rather than insomnia disorder specifically. Thus, it was deemed appropriate to also include a measure that examines insomnia against diagnostic criteria. The recent Sleep Condition



Indicator (SCI; Espie et al. 2014) assesses insomnia against DSM-5 criteria for Insomnia Disorder (American Psychiatric Association, 2013). It has been validated on large samples, has clear-cut offs for those with and without insomnia (“good sleepers”), is simple, easy and quick to use, indicating an ease of integration into future prison practice. In summary, in order to accurately assess insomnia in a prison environment it is important to include standardised measures that capture diagnostic criteria using the new SCI and subjective sleep quality from the PSQI.

### 3.3.2.3 Measures of clinical, situational, environmental and forensic factors

In addition to established prevalence, **Study 2** focuses on identifying possible issues related to sleep, including psychiatric disorder, substance misuse and prison environment. Firstly, to measure psychiatric symptoms, several possible options were considered, including examining medical records, self-report screening and assessment measures and the conduct of structured diagnostic interviews. Diagnostic interviews are the gold standard for determining a mental disorder (Nordgaard, Revsbech, Sæbye & Parnas, 2012). The Mini-International Neuropsychiatric Interview (MINI) and Structured Clinical Interview for DSM-V (SCID-V) are two of the most widely used interview techniques and have excellent reliability. However, the MINI takes at least 15 minutes whilst the SCID can take over 45 minutes to complete (Sheehan et al., 1998). Compared to research conducted in the general population there are more challenges in conducting research in a prison setting. Unusual prison routine, unpredictable changes to prison schedule and unexpected events such as prison transfer (Ramluggun, Lindsay, & Pfeil, 2010) can affect the course of the research process. Moreover, ethical, governance and security clearance approvals can also create significant delays. In this time and resource critical study in the challenging environment of a prison, saving time when possible was therefore essential, thus structured interviews were deemed unsuitable for this particular study.

Unlike diagnostic and structured interviews, self-report measures are relatively simple to complete and the fixed nature of the questions means that they are completed quickly within similar times for each person, making it easier to plan and organize the research (O'Connor & Parslow, 2010). The General Health Questionnaire (GHQ) (Goldberg & Hillier, 1979) has excellent reliability ( $\alpha = 0.70$ ) and has been used successfully in a prison setting (Hassan et al., 2011; Humber, Hayes, Senior, Fahy, & Shaw, 2011; Senior et al., 2005, 2007). Although the GHQ only takes 5 minutes to complete, it is not freely available and there is a substantial cost to use it. Furthermore, completing self-report measures in prison is difficult because responses are often unreliable due to poor recall, are incomplete and lack validity due to misunderstanding questions. Unlike self-report measures, the Brief Psychiatric Rating Scale (BPRS) (Overall & Gorham, 1962) utilizes a semi-structured approach allowing an in person one-to-one question and answer

session, which gives clarity to each question to aid participant understanding. Furthermore, a key factor in the decision making process was that the BPRS had been used regularly by my immediate research team (Offender Health Research Network) therefore they were experienced in its use and available to provide training and support in its administration. It was felt that the BPRS was the most appropriate measure as it assesses psychiatric symptoms based on semi-structured interview approach and observation; had been successfully used in a prison setting by my research team (Hassan et al., 2011; Senior et al. 2007; Shaw et al., 2006) and provided a basic overview of psychiatric symptoms. It also divides symptoms into absent; present but sub-clinical; and present to a clinical level, which is very useful in prisons where normal custodial pressures can be easily medicalised, even though issues may be more appropriately addressed by agencies other than healthcare services. In summary, a critical review of tools used in previous research with similar aims, followed by a research team discussion was conducted to agree the appropriate mental health tools to be used.

Dysfunctional beliefs about sleep are often identified as predisposing and perpetuating factors of insomnia. To the author's knowledge, only three scales exist that measure beliefs about sleep: Sleep Practices and Attitudes Questionnaire (SPAQ), The Sleep Beliefs Scale (SBS; Adan, Fabbri, Natale, & Prat, 2006) and the Dysfunctional Beliefs and Attitudes about Sleep Scale (DBAS-16; Morin et al., 2007). The Sleep Practices and Attitudes Questionnaire (SPAQ) has been produced recently to assess sleep health behaviour, including beliefs and attitudes about sleep (Grandner, Jackson, Gooneratne, & Patel, 2014). Final measures for inclusion in **study 2** were decided before SPAQ was published and before data collection commenced. However, irrespective of availability it would have been deemed inferior compared to the DBAS-16 as the SPAQ was specifically designed for sleep health and habitual behaviours rather than beliefs related to insomnia. The SBS examines beliefs about sleep related to circadian typology<sup>9</sup> and has moderate reliability ( $\alpha = 0.71$ ) (Adan et al., 2006). Finally, the DBAS-16 (Morin et al., 2007) was originally designed to assess "sleep related cognitions" specifically related to insomnia. It is the most commonly used questionnaire in this area and has slightly higher reliability scores (clinical  $\alpha = 0.77$  and research  $\alpha = 0.79$ ) than the SBS. Despite benefits of the SBS, the DBAS-16 is the only recommended tool to assess dysfunctional beliefs about sleep related to insomnia, a potential perpetuating factor and therefore was chosen for inclusion in **study 2**.

Sleep hygiene behaviour is also associated with perpetuating insomnia symptoms. However, there are only two peer reviewed measures that capture sleep hygiene

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<sup>9</sup> Morning or evening type

practice: the Sleep Hygiene Awareness and Practice Scale (SHAPS) and the Sleep Hygiene Index (SHI) (Lacks & Rotert, 1986; Mastin, Bryson, & Corwyn, 2006) both of which have limited published data. SHAPS has 32 items across three sections (sleep hygiene awareness, sleep practice and caffeine knowledge) scored on a 7-point Likert scale. The sleep hygiene awareness section has moderate reliability but sleep practice and caffeine knowledge sections have average reliability ( $\alpha = 0.55$  and  $\alpha = 0.47$  respectively). The SHI also has good validity. As each measure has limited data on efficacy the SHI was chosen because it was quick and easy to complete.

Table 6: Common tools that measure insomnia and/or sleep quality

<b>Insomnia or sleep specific</b>					
	<b>Scale</b>	<b>Measure</b>	<b>Reliability</b>	<b>Items/Scoring</b>	<b>Population</b>
1	Athens Insomnia Scale (AIS): (Soldatos, Dikeos, & Paparrigopoulos, 2003)	Severity of insomnia and impact on daytime functioning	Cronbach $\alpha$ = 0.9	8 items on a four point Likert scale 0-3. Each score dependent on the question e.g. Awakenings during the night 0 = no problem to 3 = serious problem or did not sleep at all	General adult population, psychiatric patients
2	Epworth Sleepiness Scale (ESS): (Johns, 1991)	Daytime sleepiness	Cronbach $\alpha$ = 0.7	8 items on a four point Likert scale with 0 = would never doze to 3 = high chance of dozing	General adult population, patients
3	Insomnia Impact Scale (IIS): Hoelscher, (Hoelscher, Ware, & Bond, 1993)	Impact of poor sleep on awakening function	Reliability unknown	40 items across 5 areas: physical, social, cognitive, occupational and emotional consequences of poor sleep on a 5 point scale	College students
4	Insomnia Severity Index (ISI): (C. Morin, 1993)	The severity of insomnia symptoms	Cronbach $\alpha$ = 0.90	7 items on a five point likert scale: 0 = Not at all to 4 = Extremely	General adult population
5	Insomnia Symptom Questionnaire (ISQ): (Okun et al., 2009)	Measure of chronic insomnia (past month in this case)	Cronbach $\alpha$ = 0.89	13 items on a five point likert scale: 0 = Not at all to 4 = extremely	General population, Women
6	Jenkins' Sleep Problems Questionnaire (SPQ): (Jenkins, Stanton, Niemcryk, & Rose, 1988)	Assessment of sleep problems	Test-retest reliability 0.59	4 items. How often in the past month did you: on a six point likert scale of 0 = not at all to 5 = 22-31	Cardiac surgery patients
7	Leeds Sleep Evaluation Questionnaire (LSEQ): (Parrott & Hindmarch, 1978)	Concerned with four areas of sleep	Cronbach $\alpha$ = 0.78 to .92 across the four sleep domains.	10 items across four areas: getting sleep, sleep quality, awakening and behaviour following awakening. Administered by marking a vertical line between two extreme points of the scale.	General adult population

8	Pittsburgh Sleep Quality Index (PSQI): (Buysse et al., 1989)	Sleep quality and disturbances	Cronbach $\alpha = 0.83$	19 items across 7 areas (1) Subjective Sleep Quality (1 item); 2) Sleep Latency (2 items); 3) Sleep Duration (1 item); 4) Habitual Sleep Efficiency (3 items); 5) Sleep Disturbances (9 items); 6) Use of Sleeping Medication (1 item); and 7) Daytime Dysfunction (2 items). Items 1-4 are qualitative responses; 5-18 are scored on a 4-point likert scale with 0=not during the past week to 3 = three or more times per week.	General adult population, psychiatric hospital, prison
9	Sleep Condition Indicator (SCI) (Espie et al., 2014)	Insomnia disorder to DSM-V criteria	Cronbach $\alpha = 0.89$	8 items across 4 areas: sleep continuity; sleep satisfaction; severity of symptom; and daytime consequences of poor sleep. Items on 0-4 scale with a total score of 0-32 ( $\leq 16 / > 16$ )	General population
10	Sleep Disorders Questionnaire (SDQ) (Douglass et al., 1994):	Assess different aspects of sleep quality and usual sleep habits in past month based on DSM-IV and ICSD-R criteria	Test-retest reliability between 0.75 and 0.85 across the four sleep disorder categories	175 items on a 5 point Likert scale 1 = never (strongly disagree) to 5 = always (agree strongly). Split by sleep disorder category: sleep apnea, narcolepsy, periodic limb movements and psychiatric sleep disorder	General adult population, epilepsy patients
11	The Bergen Insomnia Scale: (Pallesen et al., 2008)	Clinical assessment on diagnostic criteria of insomnia	Cronbach $\alpha = 0.80$ (patients)	6 items on a 7 point Likert scale split between sleep onset, maintenance and daytime impairment	Community, students and patients

**Comorbidity measures with sleep/insomnia sub-scale**

	Scale	Measure	Reliability	Items/Scoring	Population
1	Beck Depression Inventory (BDI) (Beck et al., 1961) sub-scale of sleep disturbance items 16 and 17	Detecting and assessing the intensity of depression.	Internal consistency .86 for psychiatric patients and .81 for non-psychiatric patients	Of the 21 items, 2 focus on sleep disturbance and fatigability. Each item is answered on a 0-3 scale and changes depending on the question.	General adult population, psychiatric inpatients, prison
2	Hamilton Rating Scale for Depression (Hamilton, 1960) items 4-6	To assess the severity of depression in individuals who have already been diagnosed with depression	Cronbach $\alpha = 0.97$	21 items: Items 4-6 focus on insomnia onset and maintenance of sleep. Each item is on a 0-2 scale.	General adult population, psychiatric inpatients, prison

3	Medical Outcomes Study Sleep Scale (MOSS-SS) part of the Medical Outcomes Study (Tarlov et al., 1989)	To assess sleep problems	Internal consistency between 0.75 to 0.86	Of the 12 items scale items 3-12 on a 6 point likert scale of 1= all of the time to 6 = none of the time. Item 1 sleep latency with 1 = 0-15 minutes to 5 = more than 60 minutes.	General adult population, children
4	Sleep-50 (insomnia sub-scale) (Spoormaker, Verbeek, van den Bout & Klip, 2005)	To detect sleep disorders based on the DSM-IV criteria	Cronbach $\alpha$ = 0.85	Of the 8 items insomnia sub-scale items 9-16 scored 1 = not at all to 4 = very much	College students, sleep patients

A final consideration was the prison environment itself. After discussions with service users it emerged that a measure was needed to identify prison environment related factors on sleep. Several steps were taken to do this. Firstly, literature about insomnia and sleep problems in prison was reviewed; however, at the time the study commenced, there were no measures available that examined specific prison-related environmental and situational factors associated with sleep. Therefore, to examine this phenomenon, there was a need to create a new measure. Potential items were identified, largely based on literature reporting on sleep issues in in-patient settings and other close contact environments similar to prisons. In particular, Topf's Disturbance Due to Hospital Noise Scale (DDHNS) measured hospital related noise (Topf, 1985; Topf & Thompson, 2001). Additional environmental items included stress, the bed and light (Topf & Thompson, 2001). Secondly, a group of the initial potential items, relevant DDHNS items and items that amalgamated DDHNS and some initial prison items were generated (Table 7). For example, noise from equipment (e.g. television), hand washing/toilet flushing and staff, and the mattress being too uncomfortable were combined with similar PESQ items. Furthermore, DDHNS items such as "alarms on equipment", "cleaning equipment" and "dinner trays and eating utensils" were deemed not applicable to prisoners and were excluded. This process also involved replacing a 0 to 10 (strongly disagree to strongly agree) to a 0 to 4 (not at all to extremely) response format. This was because generally, reliability and validity increased when using Likert scales of more than 4 and less than 7 items (Lozano, García-Cueto, & Muñiz, 2008). Thirdly, the scale was pilot tested with an ex-prisoner to assess content validity and ease of completion. This individual indicated that an additional key factor contributing towards sleep disturbance whilst in prison was not being able to switch off any thoughts and general anxiety. This was not measured by any other scale, therefore, two separate questions were added to the scale: "In the past month, my sleep was disturbed, as my mind was racing (e.g. can't switch off)" and "In the past month, my sleep was disturbed as I was worried or anxious (e.g. about being in prison, court date, not seeing my family etc.). Fourthly, reliability tests were conducted on the scale. It had a strong internal consistency ( $\alpha = .83$ ). Due to time restrictions I was unable to survey a new pool of prisoners to further test convergent and discriminant validity. Finally, the research team reviewed the completed scale for content validity. Positive feedback was given. The scale was named the Prison Environment Sleep Questionnaire (PESQ).

Table 7: PESQ components builder

DDHNS items included in PESQ unchanged	DDHNS items included in an adapted form	DDHNS items that were excluded	Any items taken directly from tools other than DDHNS	New composed items
DDHNS Bed parts were squeaking	DDHNS Hand washing and toilet flushing were combined	Falling objects such as pans, patient charts (not applicable to prisoners)	DDHNS other environmental stress items from Topf and Thompson (2001) paper pain	PESQ being too hot
DDHNS Doors opening, closing or slamming	DDHNS Air conditioning, heating and footsteps with combined with PESQ keys jangling (general prison environment)	Alarms on equipment (not applicable to prisoners)		PESQ being too cold
	Noise from Radio from DDHNS was combined with Television from PESQ	Cleaning equipment such as vacuum cleaners (not applicable to prisoners at night)		PESQ being prisoner incidents
	Telephone or intercom from DDHNS were combined DDHNS patient sounds of coughing, snoring, gagging and moaning combined and changed to prisoner sounds (PESQ snoring changed to include all above)	Paging system (not applicable to prisoners)		PESQ too light
	DDHNS loud talking in hallway, conversations between prison staff and/or socialising at the prison staff block office combined PESQ mattress too uncomfortable (DDHNS other environmental stress items from Topf and Thompson (2001) paper unfamiliar bed combined)	Equipment used for patients such as suction and/or breathing machines (not applicable to prisoners)		PESQ mind was racing
		Medicine and linen carts (not applicable to prisoners)		PESQ worried or anxious
		Dinner trays and eating utensils (not applicable to prisoners at night)		



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Visitors (no visitors allowed in  
cells at night)  
Traffic outside the hospital  
(very unlikely as prison is  
usually away from main roads)

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### 3.3.2.4 Final chosen measures

The final questionnaire pack included the following measures (full detail included in paper 3):

- The Sleep Condition Indicator (SCI; Espie et al., 2014), an 8 item self-report diagnostic measure, examines insomnia using diagnostic criteria.
- The Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989) measures sleep quality and insomnia related criteria included sleep duration.
- The Sleep Disorders Screener (Wilson et al., 2010) is a short measure (5 items) used to identify other sleep disorders including sleep apnea.
- The 13-item Sleep Hygiene Index (SHI; Mastin et al., 2006) captured level of current prisoner sleep hygiene across a scale of 1-5. One item was modified to suit the prisoner population. For example, alcohol was removed from the statement: *"I use alcohol, tobacco or caffeine within 4 hr of going to bed or after going to bed"*.
- The Dysfunctional Beliefs and Attitudes about Sleep Scale (DBAS-16; Morin et al., 2007) examined prisoner perception of sleep quality including the number of hours of sleep required to feel refreshed for the day.
- The Brief Psychiatric Rating Scale (BPRS; Overall & Gorham, 1962) used to identify the presence of psychiatric symptoms.
- The prison environment sleep questionnaire (PESQ) examined possible environmental reasons for not sleeping including noise, light and anxiety.
- Physical health questionnaire (includes chronic pain) that covers conditions related to insomnia
- Substance misuse questionnaire (includes use of opioids, stimulants and prescription medication)
- A demographics questionnaire asked about basic information including age, gender and ethnicity. Forensic characteristics such as index offence, type of sentence and length of stay in prison, and clinical characteristics including previous help for insomnia and usual sleep type (i.e. excellent to extremely bad) were also captured.

### 3.3.3 Study 3

Qualitative methods are increasingly used in health services research, specifically to know more about a disease, illness or health service from the likely differing perspectives and experiences of staff, patients and carers (Green & Thorogood, 2009). Initial discussions identified several qualitative methods that could appropriately be used to explore insomnia management in prison: 1) observations, 2) focus groups and, 3)

interviews. This section discusses each method, specifically looking at their applicability and practicality within a prison setting.

### 3.3.3.1 Observations

Outwardly, the direct observation of the staff and patient interaction within an actual clinical consultation about insomnia seems an ideal research method. Several authors have observed procedures, prison life and its impact on prison health and medication management in prisons (Bowen et al., 2009; De Viggiani, 2007). Advantages are considerable. Observations provide detailed information from start to finish; provide rich data; are ecologically valid in real world settings and utilise a flexible approach that is likely to be unaffected by researcher bias. Nevertheless, the researcher may introduce bias at the analysis stage where preconceived views of prisoners and/or staff could influence interpretation. For example, during the observation a prisoner may have become agitated, but if the researcher has pre-existing views that all prisoners are violent, simple agitation or frustration could be interpreted as more serious disruption or non-compliance.

There are further difficulties with observations, particularly with a vulnerable population (Watts, 2011). Staff and prisoners alike may exhibit the Hawthorne Effect (McCambridge, Witton & Elbourne, 2014); the premise of which is that awareness of being observed in itself could change participant behaviour. This could threaten the ecological validity of the research. Observations can also be time consuming, present issues embedding oneself in a setting that is unfamiliar and be subject to permissions from gatekeepers. In an environment that is already cumbersome with challenges negotiating access, getting approval to observe staff-patient interactions, followed by the informed consent of those involved may have proved too difficult. Observations, while interesting for future, more focussed research, were deemed inappropriate at this early stage in investigating insomnia management in prison.

### 3.3.3.2 Focus groups

Focus groups have been used successfully in a prison setting (Nurse, Woodcock & Ormsby, 2003). Focus groups can capture the natural interaction between participants, which can be revealing, opening up new lines of inquiry comparable to direct observation (Green & Thorogood, 2009). The main advantage of the group interview is that participants can build on each other's ideas, snowballing from one concept to the next (Leung & Savithiri, 2009). However, focus groups clearly have limitations, particularly in a prison environment. Ultimately, the success of focus groups is dependent on the skills of the facilitator. Therefore, prior experience, existing skills and ideally, being uninvolved with the research itself, are essential (Leung & Savithiri, 2009). This is to ensure the discussion is unbiased. Furthermore, focus groups would have

needed to have been completed in the setting where prisoners live; this brings challenges as it would be unethical to disclose information that may have repercussions to their daily living and interactions with staff and prisoners. Participants may have refrained from disclosing in a group setting or responded in a “safe” way; therefore, important information about the experience of insomnia management in prison could have been missed.

### 3.3.3.3 Interviews

Having considered observations and focus groups I felt face-to-face interviews were the most suitable option to explore perspectives of insomnia management in prison with staff and prisoners. An interview is the “gold standard” qualitative method for use in health services research (Green & Thorogood, 2009) and is a common qualitative method involving vulnerable populations, including prisoners. The rationale for using interviews in this study is threefold. Firstly, interviews provide a platform to delve into specific scenarios that would otherwise be impossible in observations. Secondly, unlike focus groups, interviews ensure the confidentiality of the data; in-depth data is produced and, as they are conducted by appointment, interviewees should have dedicated time for their completion, allowing for more efficient data collection.

Three types of interview were considered: i) in-depth unstructured interviews, ii) narrative interviews and iii) semi-structured interviews. The unstructured interview technique allows the participant to develop their own ideas whereas the narrative interview allows them to tell their story from start to finish (Green & Thorogood, 2009). This was deemed inappropriate, as the overall study had set objectives to meet that may not necessarily have come up in the context of a narrative interview. Similarly, unstructured interviews were also considered inappropriate, as the researcher has limited control on the direction of discussion and less ability to focus onto topics of specific interest. A key advantage of semi-structured interviews is that participants have the freedom to express their views whilst an experienced and skilled interviewer maintains control over the direction of discussion. In contrast, participants involved in structured interviews are forced to answer closed questions which they may find inapplicable to them, thus difficult to answer and ultimately negatively affecting their engagement with the process. The semi-structured interview was deemed the most appropriate method.

Nevertheless, the semi-structured interview is not without its limitations. Interviews are time consuming, dependent on good interviewer skills (Adams & Cox, 2008; Duffy, Smith, Terhanian & Bremer, 2005) and subject to social desirability effect (participant responding with favourable answers). In relation to insomnia, it is possible that staff would refrain from revealing potentially poor management practices or the negative

consequences other specific agendas, for example security and medication management, may have on service delivery; similarly prisoners may not disclose behaviours that were against prison rules, such as misuse of prescription medication or use of illegal drugs.

Specific care is needed when interviewing vulnerable populations, such as patients with mental health problems and prisoners. Handling sensitive topics potentially related to having trouble sleeping such as experiences of, and anxieties about, prison life, the prisoner's index offence and, specifically with women, issues around their children's care could be brought up during the course of the interview. This could be more likely with an external person (i.e. not healthcare, substance misuse or prison staff) as the prisoner may feel the researcher is a neutral party, willing to listen and that the interview is confidential. Being clear on what the researcher's role is would be paramount. The prisoner may think they can help in some way, or act as an advocate for them, which is not possible. Nevertheless, this openness may present problems keeping to topic; leading to longer interviews. However, building rapport by being an active listener, non-judgemental and interested are noted as essential for a successful interview (Silverman, 2013).

#### 3.3.3.3.1 Transcribing

Audio recordings were possible in most establishments with the consent of the Prison Service National Research Committee and the individual prison establishment concerned, as well as with consent from the participant. Audio recording equipment with encryption software was used. Recordings were kept in a locked filing cabinet at The University of Manchester, accessible to only the research team and were considered confidential. The transcripts of the interviews contained no identifying information and each participant was given a pseudonym to ensure confidentiality. Tapes were securely destroyed once transcribed.

Audio recordings were transcribed *verbatim* (word for word). Care was taken to record not only standard speech, but also slang and non-verbal information, such as laughter and interruptions (J. Green & Thorogood, 2009). The number of hours needed for transcribing was taken into account and incorporated into the project plan. As a "novice transcriber", I felt it was important to transcribe each interview personally familiarising myself with the data, in line with guidance (Gale, Heath, Cameron, Rashid & Redwood, 2013), although others have delegated this task externally.

#### 3.3.3.3.2 Thematic analysis

Several analytical approaches were considered including grounded theory, framework analysis and thematic analysis. Grounded theory is embedded in traditional qualitative foundations that derive theory from the data (Glaser & Strauss, 1967; Strauss, 1987).

Data is usually rich and theoretical (Green & Thorogood, 2009); however uncovering theory was not the primary aim of **study 3** (page 74), therefore grounded theory was rejected. Framework analysis was initially considered because it was highly structured, systematic and often considered appealing to those with a quantitative background in particular (Gale et al., 2013). However, it is also relatively complex.

Ultimately both grounded theory and framework analysis were rejected in favour of thematic analysis. Whilst grounded theory and framework have been widely used in health services research, thematic analysis is the most common technique used (J. Green & Thorogood, 2009). There are several strengths of thematic analysis including its flexibility, the breadth of commentary possible, the ability to summarise data efficiently and being able to present rich description of the data. It was also a method that could be learnt quickly and is, therefore accessible to novice qualitative researchers (Braun & Clarke, 2006). Notably, it is also recommended that experienced qualitative researchers should lead and facilitate all aspects of the analysis (Gale et al., 2013); I had no experience in qualitative research before starting this PhD. Therefore, to develop as a qualitative researcher, I felt that using thematic analysis would provide the best foundation for increasing my confidence, whilst ensuring my ability to lead the analysis.

Table 8: Stages of thematic analysis

Stage	Description
1. Familiarisation	Transcribing the data, re-reading/listening to each transcript and recording initial thoughts
2. Initial coding	Systematic coding of all transcripts
3. Codes combined to become themes	Linking codes to more general themes
4. Review themes alongside aims	Reviewing original aims, see if themes make sense and producing thematic map
5. Defining, naming and finalizing themes	Refining all themes including theme name to ensure story is clear
6. Usable quotations from each theme	Selection of extracts used to back up each theme and story

Adapted from (Braun & Clarke, 2006)

Numerous qualitative data management software packages now exist to help manage data without having to print off transcripts. Arguably making the process more manageable (Bazeley, 2013). Software is recommended for large datasets, as it aids data sharing between the research team and is more systematic than using paper and presents a clear record of coding development (Green & Thorogood, 2009). I also felt more comfortable using computer software. Moreover, my supervisors and immediate department were familiar with NVivo and I had previously received basic training in its

use. Therefore, NVivo was used to facilitate qualitative data management and analysis. Thematic analysis was conducted in standard stages (Table 8).

### 3.3.4 Study 4

#### 3.3.4.1 Consensus building

Consensus groups are typically used to identify healthcare priorities, agendas and guidance for clinical practice (Murphy et al., 1998). There are several approaches to consensus building including nominal group techniques, consensus conferences and Delphi techniques. The nominal group technique was specifically designed for group members to identify problems and solutions in person to come to a group decision (Carney, McIntosh, & Worth, 1996). Decisions are made anonymously and independently from the other group members but are then discussed as a group. However, discussion is usually limited as it only deals with one problem at a time, which presents a lacklustre group process (Centers for Disease Control and Prevention, 2006). Consensus conferences as a consensus building method have also been used sparingly in prison research but there are some studies. Again, consensus conferences are usually delivered in person at a workshop or part of a discussion group (Green & Thorogood, 2009). Face-to-face contact was not a viable option. Both the nominal group technique and consensus conference were deemed unsuitable to ensure consensus on the design of a treatment pathway for insomnia in prison because they require face-to-face contact and focus on specific problems. Logistical barriers, time constraints and multifaceted decisions process required made these methods inappropriate.

#### 3.3.4.2 The Delphi method

Traditionally, the Delphi technique is a method of obtaining group consensus from several experts considering a complex problem (Linstone & Turoff, 2002). Delphi studies have been successfully conducted to improve healthcare guidance, pathway development and in the criminal justice system (Elwyn et al., 2006; Hsu & Sandford, 2007; Keller et al., 2015; Kouyoumdjian et al., 2016; Noga et al., 2014). The Delphi technique is the only consensus building method that does not require face-to-face contact (Murphy et al., 1998). Advantages of the original Delphi method include the capability to cover wide geographical areas without the need for face-to-face contact, resulting in a timesaving and cost-effective method. Furthermore, it is flexible, primarily uses online communication and has previously been successfully used to produce a care pathway for use in police custody, an area of healthcare directly analogous to prisons (Noga et al., 2014). A Delphi study was thus considered the most appropriate consensus method.

Some modifications were made to the standard procedures for delivering Delphi study. It is good practice to involve service users in the design and delivery of health services (Staley, 2009). Commonly, the aims of health research in prison may be to understand prisoners' needs, implement appropriate services and evaluate the extent to which treatment needs are met. Nonetheless, the literature indicates that prisoners commonly believe that their opinions towards their own treatment are often overlooked (Bowen et al., 2009). Several authors have acknowledged the importance of involving prisoners in research and service redesign (Ramluggun et al., 2010). Whilst input from prisoners, as a type of 'expert', was seen to be important for this study, this presented some challenges to the usual way of delivering a Delphi study. Traditionally in a Delphi study, experts do not know each other, do not live in the same establishment and usually respond to consensus rounds via email or other electronic means. This was not possible for prisoners. Therefore, modification of the traditional Delphi design was needed. To overcome this obstacle, I met with a group of women service users in prison over a series of four face-to-face meetings in addition to the email communication from sleep and prison experts. Additional modification of the traditional method came from the inclusion of the findings from previous **studies 1-3** informing the initial pathway design.

### **3.4 Ethical considerations**

#### *3.4.1 Informed consent*

This study involved vulnerable people; the sample was drawn from prisoners, some of whom may have had physical or mental illnesses, or other conditions which affected their ability to consent or participate in the research. The provision of written, informed consent was paramount; I made sure I was careful to explain all aspects of the study to participants in order to ensure that they understood what was asked of them. If there was any doubt over any prisoner's ability to provide informed consent, health care staff were consulted. Informed consent was obtained for all participants including staff; to use an audio device to record the qualitative interviews (**studies 1 and 3**) and to use anonymous quotations in papers.

#### *3.4.2 Confidentiality*

In the context of prison research, the right to confidentiality must be balanced with the nature of the environment and the duty of care of the Prison Service. Before providing consent, participants were informed that the interview was confidential, with the exceptions of the participant providing information regarding an immediate risk to their own safety, the safety of another person, disclosure of illegal acts (previous and planned), the security of the establishment or breaking prison rules. Participants were informed of any occasion when I had to break confidentiality for these reasons. As part of **study 2** I had to break confidentiality. I believed the participant was in immediate



danger of self-injury and therefore opened an ACCT form (HM Prison Service suicide and self-harm management and support plan) and informed the relevant prison staff, as arranged with the Governor of each individual prison establishment and in line with the NHS and NOMS ethical permissions obtained for the study.

#### *3.4.3 Minimisation of harm*

The interviews covered questions of mental health and personal history, which had potential to provoke emotional reactions among interviewees. This study had strict protocols in place when this occurred. Participants were offered the opportunity to pause the interview or move onto another section of the interview if they felt they needed to. If they felt they wanted to stop the interview, the interview would have been discontinued and the participant could have withdrawn consent at any time. If I had concerns over the mental wellbeing of a participant at the end of an interview, I offered to inform health care staff with the participant's consent. To avoid inconvenience to prisoners, interviews were arranged to avoid overlap with their work/education, activities or family visits.

#### *3.4.4 Ethical and governance approval*

Approvals were obtained from an NHS ethics committee (REC for Wales, ref: 13/WA/0249), the National Offender Management Service (ref: 2013-208) and local management approvals from relevant healthcare organisations responsible for each prison.

**Insomnia Management in Prisons in England and Wales: A Mixed Methods Study**

Dewa LH, Hassan L, Shaw JJ, Senior J.

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## **SUMMARY**

Insomnia in prison is common; however, research is limited regarding the management strategies that prison establishments employ. To address this knowledge gap, we conducted a survey to identify how insomnia is detected, diagnosed and treated in prisons in England and Wales. Telephone interviews with a purposive sample of healthcare managers were then conducted. The survey was sent to all establishments holding adult prisoners, covering screening and assessment methods to detect insomnia; treatment options, both pharmacological and non-pharmacological; the importance of insomnia as a treatable condition; and staff training available. Eighty-four (73%) prisons completed the survey. Few had a stepped approach to insomnia management, as recommended by NICE guidelines. The most common treatments available were sleep hygiene education and medication, offered by 94% and 88% of respondents respectively. Analysis of telephone interviews revealed four main themes, insomnia as a normal occurrence in prison; the problem of medication in prison; the negative impact of the prison environment; and effective management of insomnia in prison. The current findings suggest that logistical, ethical and security barriers and a lack of staff knowledge and training negatively impact on the management of insomnia in prison.

**KEY WORDS:** insomnia, sleep, prison, treatment, hypnotics

## INTRODUCTION

Around a third of the adult population worldwide has insomnia at some point in their lives (Roth, 2007). Approximately 16 million prescriptions are issued for hypnotic medication in primary care annually in England (Prescribing and Medicines Team & Health and Social Care Information Centre, 2015).

Current National Institute for Health and Care Excellence (NICE) guidance in England recommends several sequential steps to manage short and long-term insomnia (NICE, 2015). Firstly, if known, possible causes of insomnia should be addressed. Secondly, basic sleep hygiene education (i.e. help in habits and practice that encourage good sleep) should be attempted. Thirdly, medication, typically hypnotics, may be prescribed, if daytime impairment is severe and previous measures have been unsuccessful. For long-term, chronic insomnia, medication is not recommended because of potential side effects, for example dependence, drowsiness and excess mortality (Kripke et al., 2012). Instead, patients should be offered non-pharmacological treatment, such as cognitive behavioural therapy for insomnia (CBTi), with referral to sleep clinics in more severe cases.

Previous studies have highlighted factors commonly associated with insomnia. Insomnia may be a symptom of various medical and psychiatric conditions (Morin et al., 2015). Risk factors for insomnia include female sex (Zhang & Wing, 2006), stressful life events (Drake, Pillai & Roth, 2014), co-morbid mental and physical disorders (Abad & Guilleminault, 2005; Czeisler, 2015) and, to a lesser extent, substance misuse (Mahfoud et al., 2009) and prescription medication use (Ferguson, 2001). In some instances these relationships are bidirectional.

Prisoners have higher rates of most of these risk factors than the general population. Notably, prisoners are nine times more likely to have a drug dependency and three times more likely to have either an alcohol dependency or depression and anxiety than the general population (Singleton et al., 1998; Singleton & O'Brien, 2000). They are also more likely to have experienced stressful life events (Carlson, Shafer & Duffee, 2010). Furthermore, the prison experience can be inherently stressful, which can contribute to insomnia (Elger, 2004; Feron et al., 2005). For example, prisoners experience a complete upheaval from normal life, family and routine (Levin & Brown, 1975); forced contact with others; and lack of autonomy (Royal College of General Practitioners & Royal Pharmaceutical Society, 2011) which can all augment the stressful experience. Moreover, poor sleep hygiene, including daytime naps, boredom or paucity of day time activity is evident in prisoners (Elger, 2009).

Very little research has been conducted on insomnia in prison internationally. Reported prevalence rates range from 11% to 81%, although populations varied and many studies

were beset with methodological problems including small sample sizes, subjective insomnia assessment and the use of non-standardised measures (Dewa, Kyle, Hassan, Shaw & Senior, 2015). Few studies have focused on the impact of interventions on insomnia in prison, such as consistent treatment guidance application and implementation of non-pharmacological treatment (Dewa et al., 2015).

Whilst the prescription of hypnotics forms part of the insomnia treatment pathway, their use in prisons is elevated compared to the general population. One study found significantly higher prescribing rates of hypnotics and anxiolytics for both men and women in prison (6.4% and 10.6% respectively) compared to the community (1.1% and 2.2% respectively) (Hassan et al., 2014). This is concerning because of the potential for misuse and diversion of such medicines. Hypnotics have a high “currency value” among prisoners and, under such circumstances, prescribing hypnotics can arguably create health and security risks (Ireland, 2002), including trading and selling (Penfold et al., 2005), bullying to obtain it from others and subsequent illicit use. Consequently, staff may question motivations for reporting insomnia and mistrust prisoners with medicines (Elger, 2008), thereby adding strain to the staff-prisoner relationship.

Untreated insomnia can negatively affect daytime functioning (Roth, 2007), work productivity (Simon & Von Korff, 1997) and can influence adverse prisoner behaviour, for example, exacerbating irritability or aggression (Ireland & Culpin, 2006). There is, therefore, a need to establish a range of evidence-based interventions which impact upon the unique clinical, social and environmental characteristics experienced by prisoners. Moreover, imprisonment should offer an opportunity to engage an unhealthy and hard to reach population with healthcare services (Reed & Lyne, 2000). To address this knowledge gap, the current study sought to identify how insomnia is currently detected, diagnosed and managed in prisons in England and Wales.

## **METHODS**

There were two stages to the study. Firstly, questionnaires were sent to healthcare managers in all England and Wales’ adult prisons. Secondly, semi-structured interviews were completed with prison healthcare staff.

### **Survey**

Based on findings from an integrative review (Dewa et al., 2015), we designed a questionnaire to elicit screening and assessment methods used, available treatment options, staff views of the scale and importance of the problem and any training available on insomnia and its management.

The questionnaire was piloted in two prisons and modified according to feedback. It was then sent to all healthcare managers in prisons holding adult prisoners (those 18 years

and older) in England and Wales. Respondents were given the option to complete and return surveys in paper format, via email, or online (i.e. SurveyMonkey). If questionnaires were not returned within four weeks, a telephone call was made to the healthcare manager to offer a further copy and/or to complete with the first author over the phone. This approach reflected best practice evidence in achieving high completion rates for postal surveys (Edwards et al., 2002).

### **Semi-structured interviews**

Following questionnaire data analysis a purposive sampling strategy was adopted, inviting a selection of healthcare managers to participate in an additional telephone interview to glean more in-depth data. We intentionally sampled sites according to their questionnaire responses, including a range of prison types. Six prisons in which structured insomnia management was already established and six in which it was less developed participated. Prisons classified as having established treatment practices met at least two of the following criteria: offered a non-pharmacological intervention recommended by NICE, had written guidance and/or had clear methods for identifying sleep problems. Prisons with less developed insomnia management practices met none or one criterion only. Topic guides were utilised for the interviews. Discussion areas included the current context, effectiveness and future direction of insomnia management.

### **Research governance and ethics**

Ethics and governance approvals were obtained from the National Health Service (NHS) ethics (REC for Wales; reference: 13/WA/0249) and National Offender Management System (NOMS; reference: 2013-208).

### **Analysis**

Data from returned questionnaires were entered, cleaned and analysed in SPSS v22 (Corp, 2011). Descriptive analyses produced counts and percentages (valid proportions). Missing data were small throughout (<10%). Totals reflect number of responses.

With respondents' consent, interviews were recorded. They were then transcribed *verbatim* and data transferred into NVivo version 10 (QSR International Pty Ltd, 2014). Thematic analysis was applied (Braun & Clarke, 2006). Following familiarisation with the data, initial codes were generated, based on anticipated categories and emerging areas of interest. Simultaneously, several interview transcripts were read, reviewed and coded by the second author to encourage inter-rater reliability. All codes were then reconsidered, checked and finalised. Data extracts and quotations were matched to each theme, building evidence into the results.

## RESULTS

### Survey

Data collection started in December 2013 and ended in December 2014. Initially, 120 prisons for adult men and women were operational in England and Wales. During the study period, five closed, resulting in a maximum potential sample of 115 prisons. Overall, 84 prisons (73%) responded. Response rates by prison type are shown in Table 1.

**Table 1:** Survey statistics, n (%)

	Completed	Total
<b>Gender, m/f</b>	79 (94)/5 (6)	103 (89)/12 (10)
<b>Prison type<sup>10</sup></b>		
Training	30 (77)	39
Local	23 (77)	30
Open	10 (83)	12
Female	5 (46)	12*
High security	5 (63)	8
Young Offender Institutions (YOI) (18+)	4 (67)	6
Other	7 (78)	9*
<b>Total</b>	<b>84 (73)</b>	<b>115</b>

\*One prison holds men and women prisoners, thus is represented in both figures.

Therefore, total prisons will add up to 116.

The importance of insomnia in clinical management was rated on a Likert scale (range 1-10, with 10 being very important). The majority of respondents gave a score of 5 or above, indicating some importance (88%; n=70). The vast majority indicated that they did not include questions about sleep problems in the initial health screening performed on all prisoners upon their initial reception into prison (98%; n=78) (Table 2). Typically, insomnia diagnoses were made by GPs (93%; n=78), followed by mental health nurses (60%; n=50) and psychiatrists (56%; n=47). A minority indicated that they used locally derived pro-forma to diagnose insomnia (23%; n=19). Only one prison used a

<sup>10</sup> A training prison gives prisoners the opportunity to take part in various activities including education, workshops and offender behaviour programmes; local prisons serve directly from courts and receive remand and post conviction prisoners, prior to their allocation to other establishments; in general an open prison holds prisoners considered low risk to absconding and low or have little risk to the public because of the nature of their offence; female establishment only holds women but can be a local, training or closed (i.e. medium to long sentences) prison; high security prisons admit the most dangerous people (i.e. mainly those serving life sentences for violent and sexual offences); YOI takes people aged 15-21 only. Usually those aged 15-17 and 18-21 are held separately; other prisons includes male/female inmates together, resettlement prison, foreign nationals and therapeutic prisons.

recommended standardised measure (the Insomnia Severity Index; (Bastien et al., 2001).

**Table 2:** Survey responses of insomnia management, n (%)

	Yes	No
Insomnia included in first health screening	2 (3)	78 (98)
First night arrangements in place for prisoners with insomnia	6 (7)	78 (93)
Locally derived tools used for diagnosis	19 (23)	64 (77)
Recommended sleep measures used* (n=78)	1 (1)	77 (99)
Insomnia referral procedure	25 (30)	58 (70)
Provided training	8 (10)	75 (90)
Medication for insomnia available	74 (88)	10 (12)
Offered non-pharmacological treatment for insomnia	72 (86)	12 (14)
Sleep hygiene advice offered	68 (94)	4 (6)

\*See Buysse et al., 2006

Most prisons used medication to treat insomnia (88%; n=74) with; zopiclone most commonly used; followed by antihistamines; the antidepressants mirtazapine and amitriptyline; and the anti-psychotics olanzapine and quetiapine (Table 3). Just over half of respondents typically prescribed 7.5mg of zopiclone (54%; n=40) and two-fifths prescribed for three days (42%; n=31; range 1-28 days). Antihistamine prescription duration varied (range 3 days to long-term) and mirtazapine and amitriptyline were typically prescribed long-term.

**Table 3:** Medication offered for insomnia, n (%)

Medication	Offered
Zopiclone	70 (95)
Antihistamines	29 (39)
Mirtazapine	19 (26)
Amitriptyline	8 (11)
Melatonin	8 (11)
Zolpidem	6 (8)
Nytol	6 (8)
Trazodone	5 (7)
Diazepam	4 (5)
Valerian	2 (3)
Olanzapine	1 (1)
Tempazepam	1 (1)
Quetiapine	1 (1)



Most prisons offered non-pharmacological interventions (86%; n=72) which was mainly basic sleep hygiene advice (94%; n=68); however this varied greatly in terms of content, timing and duration. Twenty-eight prisons (39%) offered CBT, although this was often primarily for co-existing disorders such as anxiety and not specifically for insomnia alone. A minority offered alternative therapies such as auricular acupuncture (8%; n=6), Indian head massage (3%; n=2), mindfulness (1%; n=1) and malty milk drinks (1%; n=1). In 9 out of 10 prisons (89.3%), training on sleep management was not offered to healthcare staff (see Table 2). Where available, training was routinely done in-house.

### Semi-structured interviews

Four main themes emerged from the thematic analysis: insomnia as a normal occurrence in prison; the problem of medication in prison; negative impact of the prison environment and effective management of insomnia in prison.

**Table 4:** Interview sample

Participant	Number
Occupational therapist	1
Healthcare manager	2
Mental health manager	5
Senior mental health nurse	1
Senior clinical matron	2
Clinical lead	1
<b>Total</b>	<b>12</b>

### Theme 1: Insomnia as a normal occurrence in prison

The general consensus among respondents was that sleep problems were considered a normal part of prison life and thus seen as low priority.

*“If somebody had an acute mental health problem they’d [mental health team] see them, if it was just about sleep they’d tip right back to the bottom of the list”* (Senior clinical matron 1)

To many staff members, insomnia was identified as secondary to other health conditions, including depression, anxiety and physical issues, or related to prison-related factors, for example noise or cell sharing. Staff reported insomnia as common among prisoners with substance misuse problems. One staff member identified these prisoners as being more likely to request hypnotics:

*“Predominantly it’s about patients that are coming off substance misuse in a detox programme that request sleeping tablets”* (Mental health manager 4)

Whilst, in interview, insomnia appeared relatively unimportant to staff and/or considered secondary to other conditions, some acknowledged that it may be a precursor to other conditions and therefore may merit attention.

## **Theme 2: The problem with medication in prison**

Interviewees repeatedly discussed their difficulties distinguishing between genuine symptoms of insomnia and those who feigned complaints to obtain medication. Some interviewees expressed a desire for proof of the sleep problem before offering treatment. For example, one interviewee said:

*“I don’t think we often come across many genuine sleep problems. We do work closely with the prison so if we have...concerns that someone says they are not sleeping we can put them on a sleep chart, where...officers can go...and observe them discretely throughout the night to see if they’re actually sleeping”* (Clinical lead 1).

Verifying insomnia was commonly viewed as difficult. One interviewee initially stated that they could identify prisoners who were having genuine problems sleeping, for example when they were falling asleep in the day at work. However, they then referred to another issue, which clouded the diagnostic problem currently faced by prisons, adding:

*“The people that fall asleep at work is because they’ve taken spice<sup>11</sup> the night before not because they can’t sleep”* (Mental health manager 1)

Particular concerns were expressed where staff felt the primary motivation for treatment was to receive sleeping medicines in order to misuse, sell or trade. Most interviewees acknowledged that hypnotic medications had a high currency value in prison:

*“It’s usually high risk as it’s usually used and marketed within the prison, they’ll sell it, swap it, give it to other people etc. It’s high tradable value”* (Mental health manager 3)

In contrast, some interviewees commented that prisoners believed medication was the only treatment that could help their sleep problems; staff described medicines as providing instant gratification or a “quick fix”. Staff reported that prescribers felt pressure to prescribe and would often comply with demand:

*“There’s a lot of bargaining going on in [confrontational] periods...this is what we think should happen and this is what the patient wants”* (Mental health manager 1)

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<sup>11</sup> Synthetic cannabinoid

Seemingly, as a consequence of such beliefs about wider motives for seeking medication, it was acknowledged that prescribers also faced the opposite pressure from their colleagues not to prescribe too readily, perhaps at the expense of those with genuine health concerns:

*“There’s a lot of prisoners out there, who will take any medication they can get their hands on...because obviously amongst all of it we have got to find out the people who have the genuine issues as well. And that’s the difficulty we have”.* (Mental health manager 3)

Staff felt medication prescribing was inappropriate for many prisoners, particularly those with chronic insomnia. One staff member mentioned the disagreement between the prescriber and staff member who administered the medication:

*“It’s a constant battle...sometimes you [go to] give them medication in the night and they are sleeping so you are waking them up to give them sleeping tablets”* (Healthcare manager 2)

The same staff member expressed his frustration regarding GPs continuing to prescribe medication, despite the fact that the prisoner had been observed to sleep well.

Some interviewees suggested that prisoners believed mirtazapine, an antidepressant, was a “sleeper” due to the common practice of prescribing antidepressants, and in some cases anti-psychotics, due to their sedative components. Whilst GPs may have prescribed these drugs for depression or psychosis, some may have been prescribed for insomnia alone.

*“When you ask them [prisoners] why they are on it, they say for their sleep”* (Clinical lead 1)

### **Theme 3: Negative impact of prison environment**

The prison environment was identified as having a substantial adverse influence on insomnia and its management. Many interviewees found this a difficult setting in which to implement NICE guidelines. Some highlighted that the guidance was intended for people who have autonomy and control over their routines. Staff emphasised that prisoners lacked these capabilities:

*“I think the issue is there’s a lot of emphasis from NICE...there’s a lot about health and diet and exercise, prisoners don’t have much choice in that really...especially at the*

*moment with the number of lock downs<sup>12</sup> we are having and that impacts on a prisoner's health. [Being] locked up they'll probably lie on their beds and sleep during the day"* (Healthcare manager 1)

Similarly, staff recognised difficulties in implementing good sleep hygiene in prison compared to the general population. For example, staff described particular barriers to adopting the full range of recommended actions:

*"You can't tell them to have a bit of exercise, have a shower...hot bath or something...then go to bed"* (Mental health manager 4).

However, one staff member proposed that, although some specific strategies were not possible in prison, the general principles could be applied:

*"Some of it might be amusing like having a warm bath before bed. But many principles of what is in there can be applied to the setting"* (Mental health manager 2)

To reduce trading and misuse, hypnotic medications were routinely given to prisoners under the supervision of healthcare staff. Because of the prison regime, security issues and limited evening activity, the last medication rounds were often during the late afternoon (approx. 5pm). As a consequence, staff said that prisoners were then falling asleep early evening and had early morning awakening:

*"The biggest problem we have with supervised medication is that the last dispensing is done usually around 5 o'clock in the afternoon"* (Mental health manager 3)

One interviewee was passionate about the need to change such practice, not only for improved sleep, but to give prisoners back autonomy and control over their own medication. He believed prisoners should be trusted to store and administer their own medication in line with community practice:

*"They are adults, treat them like adults. If they were in the community, apart from supervised methadone, I'm unaware of any medication that gets given out supervised by pharmacists"* (Mental health manager 3)

#### **Theme 4: Effective management of insomnia in prison**

Interviewees were asked *'what good sleep management should look like'*. Several respondents, particularly those from prisons using more developed insomnia

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<sup>12</sup> Confining prisoners to their cells

management practices, mentioned that they felt they were using NICE guidance, without necessarily referring to it as such. This took the form of using a stepwise approach: identifying sleep problems, examining potential causes of insomnia and treating insomnia holistically along with mental health, recent stressful events and lifestyle problems.

*“It’s not one single thing it’s the whole approach, you know? Supporting the healthy life style, you know. Diet, sleep, exercise – all very important”* (Clinical lead 1)

Some acknowledged that their staff had limited knowledge about sleep, insomnia and its treatment. Five staff described the need for better education and understanding of sleep and its treatment in prison. When staff were asked about ways of improving insomnia management in prison, one respondent noted the need for a more formal pathway for insomnia that incorporated information distribution, referral to appropriate teams and to examine underlying causal factors.

## **DISCUSSION**

To the authors’ knowledge, this is the first examination of the identification, management and treatment practices for insomnia in adult prisons in England and Wales. We have shown that the majority of prisons did not use standardised measures of assessment. Sleep hygiene education and hypnotic medication were the most commonly used interventions for insomnia. Qualitative analysis revealed four main themes: insomnia as a normal occurrence in prison; the problem of medication in prison: an issue of trust; inappropriate prescribing; negative impact of the prison environment and effective management of insomnia in prison.

Few prisons, even among those with more developed management insomnia practices, formally followed NICE guidance for managing insomnia. One of the main advantages of the NICE stepped-care approach is that people have access to low-intensity interventions as an alternative to medication, within a structured pathway approach that is self-explanatory, manageable and coherent (Richards et al., 2010).

In general, prisons lacked the appropriate means to assess insomnia. The most commonly offered treatments were medication or sleep hygiene education via verbal or written methods. There is however, limited evidence that sleep hygiene improves poor sleep when used alone (NICE, 2015). Almost all prisons offer medication and it is of concern that there is much less availability of psychological therapies. Our recent cross-sectional study of 237 prisoners indicated that the majority of prisoners who had possible insomnia disorder were classified as chronic (90%) (Dewa, Hassan, Shaw & Senior, 2017b); thus, if most prisoners have chronic insomnia, medication is not the appropriate course of treatment.

The general consensus among respondents was that sleep problems were considered a normal part of prison life and thus not necessarily a treatment priority. Because insomnia in prison is so common (Dewa et al., 2015), in order to achieve change, it needs to be considered worthy of treatment in its own right, due to its significant impact on quality of life, adaptation to custody and engagement in rehabilitative educational, vocational and treatment activities. There is, therefore, arguably a need for a general cultural change and staff education on sleep problems and its treatment, especially regarding appropriate GP prescribing practice.

Respondents found it difficult to distinguish between genuine insomnia symptoms and those who feigned complaints to obtain medication in order to misuse, sell or trade. To reduce trading and misuse, hypnotics were routinely administered under supervision, often at inappropriate times of the day, causing further disruption of sleep patterns. Prisoners therefore lack autonomy on when to initiate sleep. This is concerning, given that taking hypnotic medication in the afternoon and subsequent forced sleep onset at the wrong time of the day can seriously disrupt the natural sleep-wake cycle and circadian rhythm (Lemmer, 2007). This can encourage early morning awakening, and negative daytime consequences including fatigue, concentration problems and irritability.

Improved assessment of insomnia is a necessity. Clinical screening can uncover a sleep problem and distinguish between transient and chronic issues (Espie et al., 2014). Existing NICE guidance is currently followed by only few prisons, possibly because of logistical, ethical and security challenges that make this a unique environment in which to manage any healthcare issue. However, it is conceivable that the generic NICE guidance principles could be applied in an adapted manner through the development of prison specific a comparable stepped care pathway.

There are limitations to this study. Descriptions of treatment and management practices were based on self-report only and may have been subject to reporting bias. We did not access clinical records or prescribing data to verify management practices for insomnia, although this is being addressed as part of an on-going complementary study. There was also potential concern about participant bias. In the first instance, healthcare managers were approached to complete the survey and interview because of their likely more comprehensive view of prison insomnia management. However, in some instances, data came from other healthcare professionals including mental health managers, clinical matrons and psychiatrists, whose knowledge may have been less comprehensive. The survey and interviews also reflected individual perspectives of insomnia management strategies. However, given this was usually the healthcare

manager, it is assumed that they would have good knowledge of practices in their prisons.

Our findings indicate the need for more psychological therapies for long-term chronic insomnia experienced in prison. Staff indicated lack of knowledge and training in insomnia and treatment and few followed NICE guidance on insomnia. This highlights the need for better education and training for staff that could be conducive to more efficient management practice. Additionally, the prison environment and potential challenges of the prison regime requires insomnia management and its guidance to be tailored for prison use. The use of an appropriate pathway could encourage staff to be less reluctant to get involved and take sleep problems more seriously. Thus, a reduction in prescribing could be conceivable particularly because most prisoners have a chronic problem. Further research is needed to assess the application and delivery of an adapted stepped care approach that includes screening, assessment and psychological therapies for insomnia in prison.

**Trouble sleeping inside: a cross-sectional study of the prevalence and associated risk factors of insomnia in adult prison populations in England**

Dewa LH, Hassan L, Shaw J, Senior J.

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## **ABSTRACT**

### **Objective**

To investigate the prevalence of insomnia and identify associated demographic, clinical and forensic risk factors in adult prisoners in England.

### **Methods**

A cross-sectional study of 237 prisoners aged 18–72 years, across two male prisons and one female prison in North England. We used the Sleep Condition Indicator to measure probable DSM-V insomnia disorder (ID) and the Pittsburgh Sleep Quality Index to examine sleep quality. Multiple demographic, sleep, clinical and forensic self-reported measures were recorded to identify any associations with insomnia.

### **Results**

Overall, the prevalence of possible DSM-V ID was 61.6% (95% CI, 55.5%–67.8%). Subjective poor sleep quality was reported by 88.2% (95% CI, 84.1%–92.3%). Seven in ten (70.6%) female prisoners had possible DSM-V ID (95% CI, 64.8%–76.4%). Multivariable logistic regression analysis, adjusting for gender and age, indicated odds of having possible ID in prison were increased for the following factors: history of physical ill-health (OR = 3.62, 95% CI, 1.31–9.98); suicidality (OR = 2.79, 95% CI, 1.01–7.66), previously asked for help for insomnia (OR = 2.58, 95% CI, 1.21–5.47), depression (OR = 2.06, 95% CI 1.31–3.24), greater endorsement of dysfunctional beliefs about sleep (OR = 1.50, 95% CI, 1.21–1.87), poor sleep hygiene (OR = 1.11, 95% CI, 1.04–1.19), and problematic prison environment (e.g., noise, light or temperature) (OR = 1.07, 95% CI, 1.02–1.12).

### **Conclusions**

For the first time we have established the prevalence and associated factors of insomnia in a large sample of adult English prisoners. ID and poor sleep quality are common, especially in female prisoners. These findings emphasize/amplify the need for dedicated treatment pathways to improve screening, assessment and treatment of insomnia in prison.

**Keywords:** insomnia, sleep, prevalence, risk factors, prisons

## HIGHLIGHTS

- Possible insomnia disorder was highly prevalent in prisoners and more likely in women prisoners.
- Insomnia was associated with a problematic prison environment, depression, suicidality and physical-ill health.
- Insomnia was associated with poor sleep hygiene and maladaptive beliefs about sleep.
- No association was found between insomnia and substance misuse.
- The high prevalence endorses the importance of future research on the treatment targeting insomnia in prisoners.

## **INTRODUCTION**

Insomnia is defined as having difficulty initiating or maintaining sleep, or experiencing early morning awakenings, with resultant daytime impairment (American Academy of Sleep Medicine, 2005; American Psychiatric Association, 2013; World Health Organization 1992). It is the most common sleep disorder in the general population (Ohayon 1997). Prevalence estimates vary, ranging between 5% and 50% (Roth 2007; Morin & Benca 2012), depending on the type of insomnia (i.e. acute and chronic); population studied (e.g. women or men; young or elderly); and assigned definition (i.e. from symptoms of insomnia through to meeting diagnostic criteria).

Previous studies have identified risk factors for insomnia, with being female and increasing age identified as predisposing demographic risk factors for insomnia in the general population (Zhang & Wing 2006; Foley et al. 1995; Sivertsen et al. 2009; Stewart et al. 2006). Other risk factors include psychiatric disorders, particularly depression, anxiety and personality disorders (Ohayon 2002); physical ill-health (Singleton et al. 1998; Singleton & O'Brien 2000); stressful events (Healey et al. 1981); certain types of prescription medication (Hassan et al. 2014); and substance misuse (Mahfoud et al. 2009).

Prisoners have a higher prevalence of most of these precipitating factors compared to the general population (Fazel et al. 2006; Fazel & Danesh 2002; Wilper et al. 2009). In addition, the prison regime and environment may further interfere with the sleep-wake cycle due to the interruption of usual daily routines, (Levin & Brown 1975) excessive time in cell and lack of personal autonomy (Royal College of General Practitioners & Royal Pharmaceutical Society 2011). Lack of control over the physical environment are also likely to cause further disturbance, including experiencing too much or too little light (Hauri 1981); excessive noise (Hauri 1981; Kageyama et al. 1987) and uncomfortable furnishings (Morin & Espie 2003).

There are significant gaps in the literature pertaining to insomnia in prison. A recent systematic integrative review of both quantitative and qualitative studies into insomnia in prison reported on the findings from 33 papers (Dewa et al. 2015). Prevalence rates ranged from 11% to 81%; however studies were heterogeneous in terms of methodologies employed, sample size and jurisdiction. No studies examined insomnia disorder (ID) prevalence in a prison setting. The authors proposed prevalence rates of insomnia using validated measures were needed to ensure they are measuring what is indicated (i.e. insomnia).

In line with the general population, insomnia was more common in women prisoners; however, this was based on only three studies reporting gender-specific prevalence rates (Singleton et al. 1998; Diamond et al. 2008; Kjelsberg & Hartvig 2005). Some

studies used the Pittsburgh Sleep Quality Index (PSQI) (Buysse et al. 1989), a recommended measure for sleep quality and insomnia symptoms (Buysse et al. 2006), but no studies utilised a tool designed to formally diagnose insomnia based on Diagnostic and Statistical Manual of Mental Disorders, 5<sup>th</sup> edition (DSM-V) or International Classification of Sleep Disorders (ICSD-2) criteria such as the Insomnia Severity Index (ISI; Morin 1993) or Sleep Condition Indicator (SCI; Espie et al. 2014). In view of the differences between studies and issues of scientific quality, the review concluded that definitive data on prevalence, gender differences and risk factors are still lacking.

In this paper we will establish the prevalence of insomnia in several English prisons and identify demographic, clinical and environmental factors to inform service delivery.

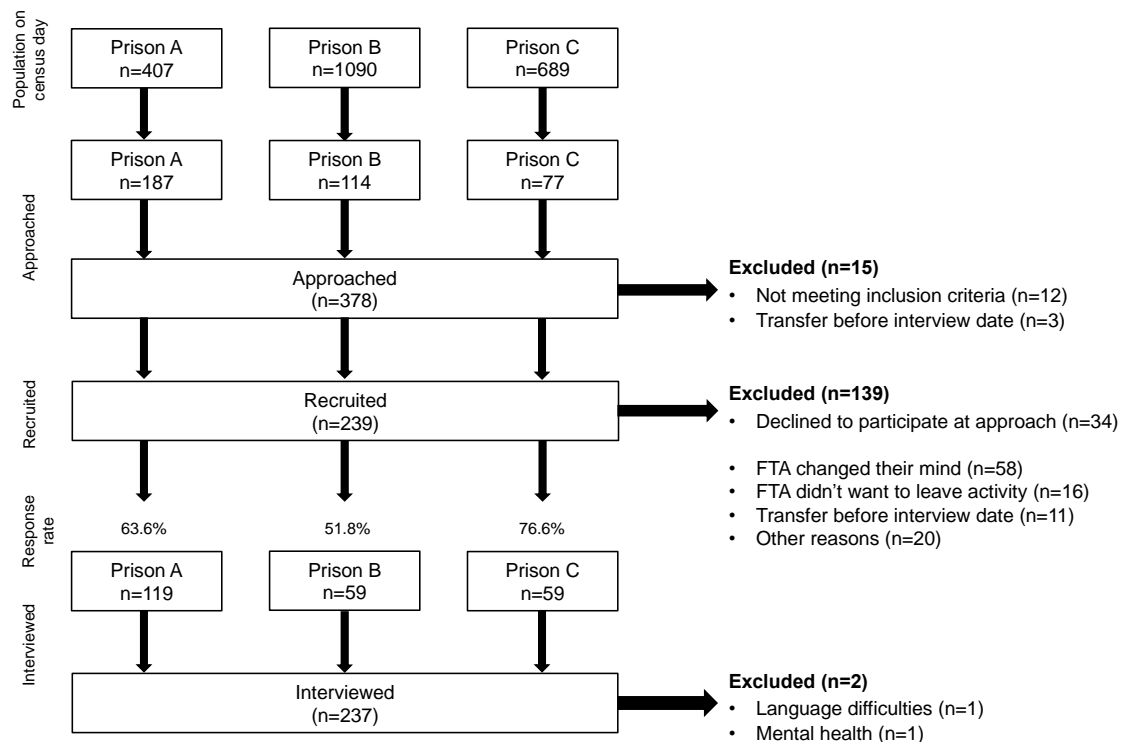
## **METHODS**

### **Participants and setting**

Prisoners were randomly sampled from two prisons for adult men (one category B local prison which serve local courts, accepting sentenced and newly convicted prisoners or those serving short sentences and one category C training which houses men part way through longer sentences in the North West<sup>13</sup>) and one prison for young and adult women in North East England from January 2013 through April 2014. Inclusion criteria were prisoners over 18 and able to consent for themselves. The exclusion criteria were: unable to provide informed consent due to being too physically or mentally unwell; presence of risk markers that indicated that the interview could not be conducted alone and non-English speaking. No additional reward was given to prisoners from participating in the study. However, interviews were arranged to avoid overlap with their participating activities. The study was approved by the National Health Service (NHS) Research Ethics Committee for Wales (ref: 13/WA/0249); the National Offender Management Service (ref: 2013-208); local research governance boards; and prison governors from each participating prison. All participants gave informed written consent.

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<sup>13</sup> In England and Wales prisons for adult men are categorised in terms of their security with category A prisons being the most secure through to category D which are open prisons. Most recent population figures show that 38.3% of adult men are held in cat B and 25.5% in category C conditions. Just under 5% of the prison population are women. We sampled approximately 9.3% of the overall women's prison population.



**Figure 1: Flowchart of recruitment. FTA, failed to attend.**

### Sample size calculation

The sample size was calculated using the identification of insomnia as the main outcome. Ascertaining a precise prevalence benchmark of insomnia was difficult due to reported wide prevalence (11.8% and 81.0%) and variation in insomnia definitions and methodologies used across previous studies (Dewa et al. 2015). Therefore, for the purpose of estimating sample size, we assumed the prevalence rate of insomnia to be 50% (the value that would produce the highest possible sample size). On this basis, a total of 92 participants were needed to estimate the proportion of prisoners with insomnia among a prison population of 1826<sup>14</sup>, with a 10% margin of error and a 95% confidence interval. To perform secondary analyses, increasing the sample to 202<sup>15</sup> allowed the detection of differences in key predictors between those with and without insomnia. To further guard against a possibly higher than anticipated dropout rate, the final sample required was increased to 240.

### Protocol

Data collection was carried out across the three sites concurrently; each prison could accommodate the research on a limited number of days each week, thus working across all three made best use of the researcher's time. A census day was chosen for each site

<sup>14</sup> Total population on census days across three prisons.

<sup>15</sup> Identified as the number needed from sample size calculation.

on which a list of all current prisoners was obtained and prisoner names and cell locations only were transferred to a Microsoft Excel spreadsheet. Using a random number generator formula, a list of prisoners to be approached for inclusion was created. When all prisoners on the list had been approached, another list was generated and the process repeated until the required number of participants was achieved.

Prison officers initially approached potential participants to determine interest in talking to the researcher about the study. For each prisoner who expressed interest in taking part, a provisional interview date and private interview room was organised for at least 24 hours later to give them time to decide whether they still wanted to take part. A questionnaire battery was then administered with each participant face-to-face to ensure clarity and understanding of questions.

### **Measures**

Each interview comprised a battery of validated sleep measures and one tool specifically designed for this study.

#### **Sleep measures**

The Sleep Condition Indicator (SCI; Espie et al. 2014) is an 8-item screening tool used for further evaluation of possible 'insomnia disorder' (ID) using a clinical interview. The term ID will be used henceforth. The SCI is unique in appraising symptoms specifically against DSM V diagnostic criteria for ID (American Psychiatric Association 2013), including sleep continuity; sleep satisfaction; severity of symptom; and daytime consequences of poor sleep. Items are rated on a 0-4 scale with a total score of  $\leq 16$  indicating possible ID. Excellent reliability ( $\alpha=89$ ) and good concurrent validity have been demonstrated for the SCI (Espie et al. 2014; Espie et al. 2012).

The Pittsburgh Sleep Quality Index (PSQI; Buysse et al. 1989) assesses subjective sleep quality. The 19 items encompass seven domains including sleep latency (the time taken to fall asleep), sleep duration, sleep quality, efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction. Each item is scored 0-3 and the sum allows for a subjective sleep quality score. A cut off score of  $>5$  distinguish 'poor sleepers' from 'good sleepers' ( $\leq 5$ ). The PSQI has excellent reliability ( $\alpha=89$ ) and has been recommended for measuring insomnia symptoms (Buysse et al. 2006).

The Sleep Disorders Screener (SDS) (Wilson et al. 2010) is a short tool that identifies sleep disorders other than insomnia, used in clinical practice. It screens for narcolepsy; circadian rhythm sleep disorder; parasomnia; sleep breathing disorder; and periodic limb movements of sleep/restless legs syndrome (PLMS/RLS). Internal consistency is excellent ( $\alpha=.79$ ).

The Sleep Hygiene Index (SHI) (Mastin et al. 2006) is a 13 item tool to measure sleep hygiene practice. Each item reflects an element of poor sleep hygiene, for example coffee before/after going to bed; irregular sleep onset and awakening; and daytime nap. One item was changed by removing reference to alcohol, to reflect the prison environment. Test-retest reliability ( $r(139)=0.71$ ,  $p<0.01$ ) and validity is good (Mastin et al. 2006).

The Dysfunctional Beliefs and Attitudes about Sleep (DBAS-16)(Morin et al. 2007) scale comprises 16 statements rated on a Likert scale of 0-10, with 0 being strongly disagree and 10 strongly agree. An average score is obtained from all the questions. Each statement reflects beliefs and attitudes about sleep, with higher scores indicative of dysfunctional beliefs. Reliability of the measure is also excellent ( $\alpha=0.79$ ).

### **Demographic, forensic and clinical measures**

The Brief Psychiatric Rating Scale (BRPS) (Overall & Gorham 1962) is a commonly used measure of a wide range of individual psychiatric symptoms, rather than being a diagnostic tool for one or more specific diagnoses. There are 24 items that represent symptom constructs including hostility, anxiety and psychotic symptoms. Each is scored on a scale of 1 (not present) to 10 (extremely severe), relating to the previous 2 weeks. Thresholds of clinical severity are given for each item, to be explored through semi-structured interview. Items scores can be divided into absent, present at clinical level and present but sub-clinical. Reliability is excellent (Overall & Gorham 1962).

Because no measure to assess the impact of the prison environment on sleep existed, one, named the Prison Environment Sleep Questionnaire (PESQ), was designed especially for this study. The PESQ is a 16-item measure to capture elements of the prison environment likely to disturb sleep. Items were developed, defined and selected on the basis of previous literature (Topf 1985; Topf & Thompson 2001) and through consultations with prison based clinicians and an ex-prisoner. Factors such as noise, temperature, light or psychological issues (e.g. being worried or anxious, thinking too much) were included. Reliability tests showed it had a strong internal consistency ( $\alpha=.83$ ).

A pro-forma questionnaire to capture basic demographic information, including age, gender and ethnicity; lifetime substance misuse; and any physical health conditions known to be associated with insomnia (e.g. chronic pain, gastrointestinal problems etc.) was also created and administered.

### **Statistical analysis**

Descriptive data were used to describe demographic, forensic and clinical characteristics. The prevalence of insomnia was estimated using counts, proportions

and 95% confidence intervals (CI). Chi-square and t-tests were used to determine associations between dichotomous and continuous data, respectively. Multivariable logistical regression techniques adjusted for gender and age were performed to identify predictors of insomnia, with demographic, clinical, and prison-related factors entered as independent variables. To ensure the best model fit, we firstly included all predictors previously associated with insomnia in the literature including physical ill-health, sleep hygiene and all psychiatric symptoms (e.g. depression, suicidality etc.) measured using individual BPRS items. We then added prison-related factors to the model such as prisoner status and prison environmental factors. We reviewed and reduced the model systematically at each stage based on the authors' judgment and variance explained ( $R^2$ ), eliminating individual predictors where they did not contribute to the full model, irrespective of significance in univariable analyses. Data management and analysis were performed using SPSSv22 (Corp 2011).

## RESULTS

### Demographic, forensic and clinical characteristics

Two hundred and thirty-nine prisoners gave written consent. Figure 1 shows reasons for non-attendance. The required sample size was achieved as 118 men and 119 women completed full interviews. Table 1 shows the demographic and forensic characteristics. Mean age was 36.2 ( $\pm 11.9$ ) and less than a fifth were from Black, Asian and minority ethnic backgrounds (BAME) (13.9%;  $n=33$ ). The average duration of time in prison was 25.4 months ( $\pm 37.9$ ), ranging from less than a month to 30 years.

**Table 1:** Demographic and forensic characteristics of prisoners ( $n=237$ )

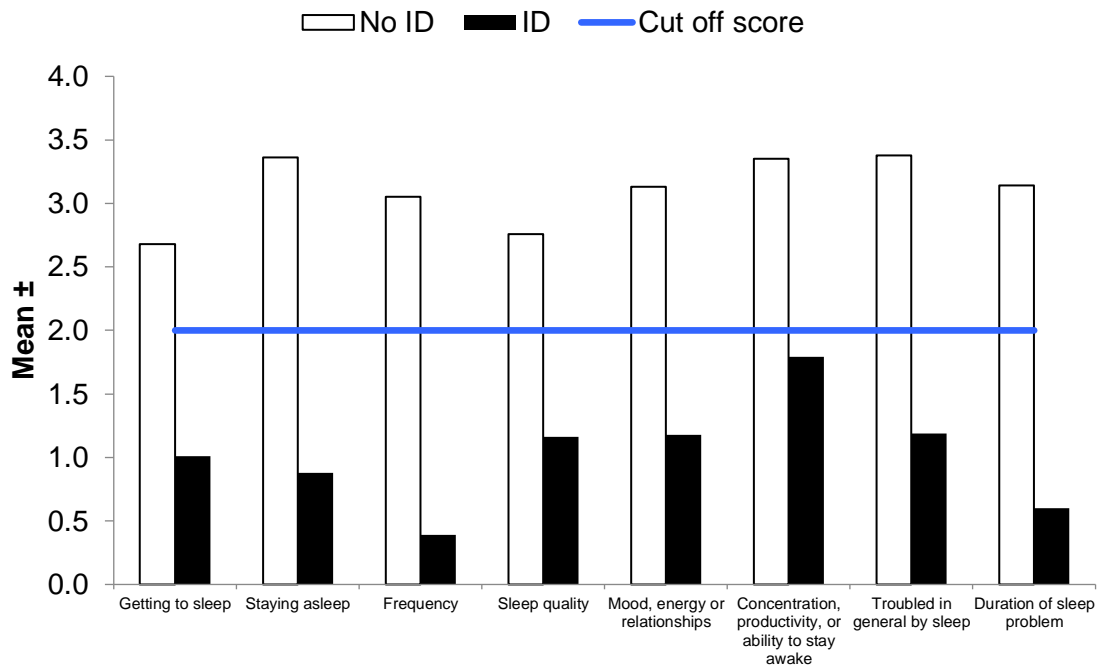
	Prison A	Prison B	Prison C	Number [%]
<b>Gender</b>				
Men	0	59	59	118 [49.7]
Women	119	0	0	119 [50.2]
<b>Age group</b>				
18-24	21 [17.6]	9 [15.3]	10 [16.9]	40 [16.9]
24-29	16 [13.4]	15 [25.4]	11 [18.6]	42 [17.7]
30-44	58 [48.7]	17 [28.8]	26 [44.1]	101 [42.6]
45-64	21 [17.6]	14 [23.7]	10 [16.9]	45 [19.0]
65+	3 [2.5]	4 [6.8]	2 [3.4]	9 [3.8]
<b>Ethnicity</b>				
White-British	100 [84.0]	48 [81.4]	56 [94.9]	204 [86.1]
Asian or Asian British	4 [3.4]	3 [5.1]	1 [1.7]	8 [3.4]
Black or Black British	5 [4.2]	5 [8.5]	1 [1.7]	11 [4.6]
Mixed Background	5 [4.2]	1 [1.7]	1 [1.7]	8 [3.4]
Other	5 [4.2]	2 [3.4]	0	6 [2.5]
<b>Marital status</b>				



Single	88 [73.9]	42 [71.2]	47 [79.7]	177 [74.7]
Married	18 [15.1]	4 [6.8]	4 [6.8]	26 [11.0]
Divorced	4 [3.4]	12 [20.3]	6 [10.2]	22 [9.3]
Other	9 [7.6]	1 [1.7]	2 [3.4]	12 [5.1]
<b>Index offence</b>				
Violent offence	32 [26.9]	22 [37.3]	12 [20.3]	66 [27.8]
Robbery offence	15 [12.6]	6 [10.2]	12 [20.3]	33 [13.9]
Burglary	10 [8.4]	10.2 [10.2]	10 [16.9]	26 [11.0]
Sexual offence	9 [7.6]	14 [23.7]	4 [6.8]	27 [11.4]
Drug offence	6 [5.0]	5 [8.5]	11 [18.6]	22 [9.3]
<b>Prisoner status</b>				
Sentenced	110 [94.4]	59 [100.0]	43 [72.9]	212 [89.5]
Remand	8 [6.7]	0 [0.0]	13 [22.0]	21 [8.9]
Un-sentenced	1 [0.8]	0 [0.0]	3 [5.1]	4 [1.7]
				<b>Mean [SD]</b>
<b>Previous number of times in prison</b>	3.0 [7.8]	2.7 [5.5]	5.3 [8.2]	3.5 [7.4]
<b>Duration of time in prison (months)</b>	22.1 [29.3]	47.0 [56.7]	9.7 [10.4]	25.4 [37.9]

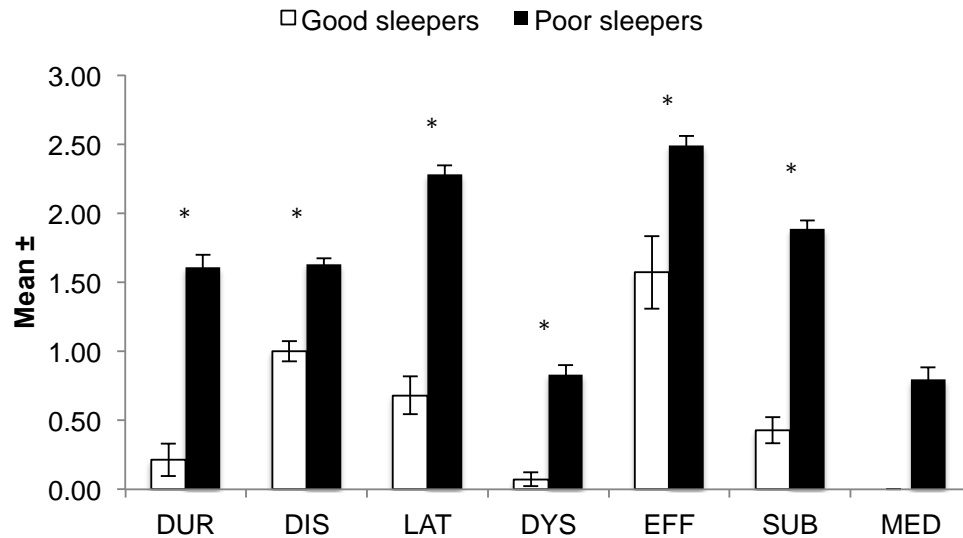
### Prevalence of insomnia and sleep quality

Using stringent DSM-V criteria (as measured by the SCI), 61.6% (95% CI, 55.4%-67.8%) prisoners had ID. Nearly two-thirds of prisoners with ID took longer than 60 minutes to initiate sleep (61.0%; CI, 53.1%-68.9%). Most prisoners with ID were classified as chronic ( $\geq 3$  months; 89.7%; CI, 84.8%-94.6%) and had it for more than 3 nights a week (95.2%; CI, 91.7%-98.7%). Individually, SCI component scores for prisoners with ID were all significantly lower than prisoners without ID, which indicated the presence of distinct symptoms of insomnia (Figure 2).



**Figure 2:** SCI components among prisoners with and without ID. SCI, sleep condition indicator; ID, insomnia disorder. \* $p < .001$ .

The prevalence of those who subjectively regarded themselves as “poor sleepers”, as measured by the PSQI, was 88.2% (CI, 84.1%-92.3%). Scores for all PSQI items were significantly higher among poor sleepers than good sleepers. In particular, sleep latency mean scores were significantly higher for poor sleepers than good sleepers (2.28 vs. 0.68;  $t(235) = -8.570$ ,  $p < .001$ ) (Figure 3).



**Figure 3** - PSQI components by sleep type. DUR, duration; DIS, sleep disturbance; LAT, sleep latency; DYS, daytime dysfunction; EFF, sleep efficiency; SUB, subjective sleep quality; MED, sleep medication. \* $p < .001$ .

#### **Gender differences in insomnia and sleep quality**

ID was significantly more prevalent in women (70.6%; CI, 62.4%-78.8%) than men (52.5%; CI, 43.5%-61.5%) ( $\chi^2 = 8.157$ ;  $p < .005$ ). Women also reported significantly more problems initiating sleep (1.38 vs 1.92;  $t(232) = 2.543$ ,  $p < .05$ ) and their mood, energy or relationships were more negatively affected by poor sleep than men (1.61 vs 2.26;  $t(235) = 3.419$ ,  $p < .01$ ).

#### **Clinical factors associated with insomnia**

Clinical characteristics and sleep-related symptoms of prisoners with and without ID are summarised in Table 2. No significant differences were found between ID and no ID groups on lifetime substance misuse, except lifetime amphetamine and heroin use (Table 2). Prisoners with ID were significantly more likely than the no ID group to have previously sought help for insomnia; had pain in the last month; and reported a history of physical ill-health (Table 2). Prisoners with ID had significantly higher mean scores on poor sleep hygiene and were more likely to endorse dysfunctional beliefs about sleep. Moreover, prisoners with ID had significantly higher BPRS scores, reflecting more severe subclinical mental health problems (Table 2). Notably, prisoners with ID were significantly more likely to exhibit symptoms of anxiety, depression, suicidality and suspiciousness.

**Table 2:** Clinical and sleep-related characteristics for prisoners by ID status

	ID (n=146)	No ID (n=91)	Statistic	P value
<b>Clinical characteristics</b>				
<i>Prior service lifetime use</i>				
Previous help for insomnia (N, %)	104 [71.2]	31 [34.1]	31.588	<0.001
<i>History of physical ill health</i>				
Reported pain in last month (N, %)	96 [65.8]	31 [34.1]	22.632	<0.001
Reported history of physical ill-health (N, %)	124 [84.9]	64 [70.3]	7.288	0.007
<i>Reported drug use (lifetime)</i>				
Amphetamines (N, %)	75 [51.4]	35 [38.5]	3.756	0.053
Heroin (N, %)	58 [39.7]	25 [27.5]	3.699	0.054
<i>Recent psychiatric symptoms (BPRS)</i>				
Anxiety (mean, SD)	2.7 [1.4]	1.7 [0.9]	-6.684	<0.001
Depression (mean, SD)	2.7 [1.5]	1.5 [0.8]	-7.845	<0.001
Disorientated (mean, SD)	1.1 [0.5]	1.0 [0.2]	-2.330	0.034
Elevated mood (mean, SD)	1.4 [1.0]	1.2 [0.6]	-2.596	0.021
Guilt (mean, SD)	1.9 [1.2]	1.4 [0.8]	-4.100	<0.001
Hostility (mean, SD)	1.9 [1.2]	1.5 [0.8]	-4.422	0.001
Somatic concern (mean, SD)	1.8 [1.2]	1.3 [0.6]	-3.531	<0.001
Suicidality (mean, SD)	1.4 [1.0]	1.0 [0.2]	-4.120	<0.001
Suspiciousness (mean, SD)	2.0 [1.0]	1.3 [0.7]	-5.740	<0.001
Tension (mean, SD)	1.5 [0.7]	1.3 [0.6]	-2.052	0.041
Unusual thought content (mean, SD)	1.4 [0.9]	1.1 [0.6]	-2.729	0.007
BPRS (mean, SD)	35.4 [7.5]	30.1 [5.3]	-6.442	<0.001
<b>Sleep-related beliefs and symptoms</b>				
SDS <sup>16</sup> (N, %)	66 [45.2]	16 [17.6]	18.903	<0.001
SHI (mean, SD)	32.7 [7.5]	27.0 [6.2]	-6.140	<0.001
DBAS-16 (mean, SD)	5.7 [1.9]	3.8 [1.8]	-7.546	<0.001
PSQI (mean, SD)	12.9 [3.2]	6.9 [2.6]	26.887	<0.001
SCI (mean, SD)	8.2 [4.5]	24.9 [4.8]	-15.315	<0.001

BPRS, Brief Psychiatric Rating Scale; SHI, Sleep Hygiene Index; DBAS-16, Dysfunctional Beliefs and Attitudes about Sleep Scale; PESQ, Prison Environmental Sleep Questionnaire; PSQI, Pittsburgh Sleep Quality Index; SCI, Sleep Condition Indicator; SD, standard deviation; SDS, other sleep disorder.

### Prison-related environmental factors of insomnia

The PESQ also revealed that overall mean scores of prison-related situational factors were significantly higher in those with ID ( $p<.001$ ) (Table 3). Similarly, mean scores for several individual items were significantly higher for those with ID, including

<sup>16</sup> Additional descriptive statistics provided in Appendix L

uncomfortable mattresses, being too hot and noise.

**Table 3:** PESQ components for prisoners by ID status

	ID (n=146)	No ID (n=91)	Statistic	P value
<b>PESQ component</b>				
Worried or anxious (mean, SD)	2.5 [1.5]	1.0 [1.2]	-8.427	<0.001
Mind was racing (mean, SD)	2.5 [1.5]	1.0 [1.3]	-8.734	<0.001
Noise from doors slamming (mean, SD)	1.8 [1.5]	1.1 [1.4]	-3.547	<0.001
Noise from the prison environment (mean, SD)	1.6 [1.7]	0.9 [1.2]	-3.943	<0.001
Prisoner sounds (mean, SD)	1.3 [1.5]	0.7 [1.1]	-3.825	<0.001
Noise from staff (mean, SD)	1.3 [1.5]	0.8 [1.3]	-2.529	0.012
Water noise (mean, SD)	1.1 [1.5]	0.6 [1.2]	-2.580	0.011
Noise from the TV and/or radio (mean, SD)	1.0 [1.1]	0.6 [1.4]	-0.247	0.026
Noise from intercom or telephone (mean, SD)	0.8 [1.3]	0.6 [1.1]	-1.357	0.176
Bed parts squeaking (mean, SD)	0.7 [1.2]	0.4 [0.9]	-1.927	0.055
Mattress was too uncomfortable (mean, SD)	2.4 [1.7]	1.5 [1.8]	-4.131	<0.001
Physical pain (mean, SD)	1.6 [1.6]	0.5 [1.0]	-6.635	<0.001
Too hot (mean, SD)	1.5 [1.6]	0.8 [1.2]	-3.891	<0.001
Too cold (mean, SD)	1.1 [1.5]	0.6 [1.0]	-2.519	0.012
Too light in my cell (mean, SD)	0.8 [1.3]	0.3 [0.9]	-3.291	<0.001
Prisoner incidents <sup>17</sup> (mean, SD)	0.4 [0.8]	0.3 [0.7]	-1.485	0.139
PESQ total (mean, SD)	22.3 [11.5]	11.6 [9.1]	-7.947	<0.001

### Multivariable factors of insomnia

A multivariable logistic regression analysis was performed to identify risk factors for insomnia in prison (Table 4). After adjusting for gender and age, non-retained variables included suspiciousness, disorientation, physical pain, prisoner status, lifetime heroin use, index offence, prisoner status, previous number of times in prison and duration of time in prison. Nine variables remained - history of physical ill-health, previous help-seeking for insomnia, depression, anxiety, suicidality, dysfunctional beliefs and attitudes about sleep, poor sleep hygiene, other sleep disorders and problematic prison environment. Of particular significance were history of physical ill-health, suicidality, previous help for insomnia and depression. The full model was significant ( $\chi^2$  (6, n=237)

<sup>17</sup> Including a violent incident, general prisoner disturbance etc.

= 107.703,  $p < .001$ ).

**Table 4:** Summary of multivariable logistic regression with clinical and forensic factors of insomnia

Factor	Logistic coefficient	Odds ratio (OR)	95% CI	P value
Reported history of physical ill-health	1.286	3.62	1.31-9.98	0.013
BPRS Suicidality	1.024	2.79	1.01-7.66	0.047
Previous help for insomnia	0.946	2.58	1.21-5.47	0.014
BPRS Depression	0.723	2.06	1.31-3.24	0.002
DBAS-16	0.405	1.50	1.21-1.87	<0.001
SDS	0.308	1.36	0.57-3.25	0.488
SHI	0.103	1.11	1.04-1.19	0.003
PESQ	0.069	1.07	1.02-1.12	0.003
BPRS Anxiety	-0.355	0.70	0.43-1.14	0.153

Nagelkerke  $R^2$  .59

BPRS, Brief Psychiatric Rating Scale; SHI, Sleep Hygiene Index; DBAS-16, Dysfunctional Beliefs and Attitudes about Sleep Scale; PESQ, Prison Environmental Sleep Questionnaire; SDS, other sleep disorder; CI, confidence interval.

## DISCUSSION

### Main findings and comparison to other studies

This study is the first to estimate prevalence and predictors of ID in adult prisoners in England. Perhaps the most striking finding is that, overall, two-thirds of the sample had possible ID (61.6%) compared with 45.7% of a large UK general population sample using the same measure (SCI) (Espie et al. 2012). In our study, 70.6% of female prisoners had possible ID, which is comparable to a previous prison study, despite their less stringent use of DSM-V criteria (Singleton et al. 1998). In line with previous studies conducted in the wider community, we found that physical ill-health, dysfunctional beliefs about sleep, poor sleep hygiene and depression were all significantly associated with insomnia (Carney & Edinger 2006; LeBlanc et al. 2009). Additionally, results infer prison environmental factors and suicidality are also associated with insomnia in prison.

Insomnia is a symptom of depression worldwide (Sivertsen et al. 2014). There is very strong evidence of an association between depression and suicide; indeed, risk of suicide completion is 20-fold increase when the individual has experienced a major depressive episode (Lönqvist 2008). This relationship posits increased likelihood that the relationship between suicide and insomnia may be due to depression. This may be because of the complexity between suicide, depression and insomnia (Sivertsen et al. 2012). However, there is increasing evidence showing an association between insomnia and suicidality in the general and prison populations (Bernert & Joiner 2007; Bernert et al. 2014; Carli et al. 2011; Littlewood et al. 2016). Furthermore, in a sample of 1420 prisoners, insomnia significantly predicted suicidality, independent of depression (Carli et al. 2011). Our findings also

highlighted an association between insomnia and suicidality and insomnia and depression separately in a prison population. However, we are only the second study to examine the relationship between suicide and insomnia in prison therefore, more research is needed to verify the association.

Community studies have found substance misuse to be associated with insomnia (Abad & Guilleminault 2005; Mahfoud et al. 2009); however, in our study there was no relationship between all-encompassing illicit substance misuse and insomnia in prison. Individual drugs, heroin and amphetamine use were significantly associated with insomnia in our univariable analyses, but they were not retained as a predictor in multivariable analyses. This contrasts with previous studies, which have more strongly identified substance misuse as a predictor of insomnia. This discrepancy could be due to methodological differences, such as limited specificity in our measure. Alternatively, it could indicate that the relationship is more complex than first thought. Most prison studies into insomnia to date have focused on one or two factors; only two studies looked at a range of factors in a holistic manner (Elger 2004; Elger & Sekera 2009). Both studies found substance misuse predicted insomnia, in contrast to our study. However, these studies relied on data gathered retrospectively from clinical notes describing physician consultations, a method, which arguably lacks consistency and construct validity, potentially underestimating insomnia.

### **Assessing the prevalence of insomnia**

The findings from our integrative review proposed prevalence rates of ID using validated measures that are assessing what they deem to be measuring. The SCI is a robust diagnostic tool utilising DSM-V criteria for ID and the PSQI measures insomnia symptoms, both validated on several populations. In this study, overall prevalence of ID according to the SCI (Espie et al. 2014) was 61.6%; and 88.2% of the sample experienced subjectively poor sleep using the PSQI (Buysse et al. 1989). Estimates of the former tool are valid, but the latter has previously been used successfully in a prison environment (Elger & Sekera 2009) and community, which allows for comparison of symptoms across studies. Based on this combination, we can be confident that insomnia is common in prison, however the gold standard full independent clinical interview would be needed to further verify these results.

### **Implications**

The high prevalence of insomnia suggests it is a public health concern in prisons, which highlights the need for treatment attention, particularly because of its association with other pertinent conditions in prison such as mental and physical ill health. Prisoners are generally more likely to have chronic physical conditions, four times more likely to have a mental health condition and seven times more likely to commit suicide than the general population (Fazel & Danesh 2002; Fazel & Seewald 2012; Fazel & Baillargeon

2011). Notably, suicide is four times more likely to occur at night, a time when prisoners are locked down, and staff are limited, therefore regular checks are reduced (Perlis et al. 2016). Being awake at night may therefore represent vulnerability for completed suicide in prison. Knowing that insomnia is linked to physical and mental health conditions could explain why these conditions are common in prison which points towards the need for appropriate screening, assessment and treatment of insomnia in prison. Identifying predisposing, precipitating and perpetuating factors underlying insomnia in prison can help target treatments (Buysse 2008) and may offer potential for early detection and prevention of insomnia. In particular, women are more likely to have insomnia (predisposing) and prisoners with insomnia may exhibit symptoms of depression and suicidality (precipitating) and have maladaptive beliefs about sleep and poor sleep hygiene (perpetuating), which can help to inform service delivery. These study findings alongside wider evidence could be used as the basis of a clinical pathway to help effectively manage insomnia in prison.

### **Limitations**

Several limitations to this study need to be acknowledged. Firstly, as a cross-sectional design was utilised, no conclusions can be made about causality. The history of previous help for insomnia may suggest the presence of lifetime history of insomnia; notably, pre-existing insomnia may predispose prisoners to insomnia before prison admission. Secondly, results were based on survey responses and therefore may potentially be subject to self-report bias. Nevertheless, the subjective nature of the assessment is applicable and likely to be in line with day-to-day healthcare consultations, so is ecologically comparable. Despite this, objective measures such as PSG (i.e. physiological recording of awake and rest activity) or actigraphy (i.e. a wrist like device that measures awake and rest activity) could further elucidate findings. Thirdly, whilst the overall sample size was reasonable, lack of power in some sub-analyses may have explained some borderline significant results, incurring a potential risk of type-II statistical error. Fourthly, the PESQ is not validated therefore; results should be examined with caution. Fifthly, only DBAS-16 total score was used, mainly because most other studies using DBAS-16 have used total score, thus data would be widely comparable. However, the four DBAS-16 subscales: consequences, worry/helplessness, sleep expectations and medication may have provided additional information that would help to facilitate sleep improvement applicable to treatment not found when using total score (Chung et al., 2016). Lastly, generalizability may be limited due to sampling issues. For instance, on approach some prisoners were excluded, such as prisoners without capacity to consent due to severe mental and physical health problems. We emphasised that participation was not dependent on being a poor sleeper, however it is possible that those with no sleep problems excluded themselves. This may have resulted in underrepresentation of good sleepers. However, only 9% (n=34) of prisoners declined to participate on approach. Moreover, only one female



prison, category B local and category C training prisons participated, representing around 70% of the England and Wales' prison population. We did not sample prisoners from category A, high secure; category D, open prisons or anyone under 18 years old. Our results therefore may not be generalizable to the entire England and Wales prison estate and need to be interpreted with caution.

### **Conclusion**

This study has identified the prevalence of insomnia and examined associated factors in prison populations. Notwithstanding limitations, the study suggests that the prevalence for possible ID is higher in prisons than in the general population. A range of associated factors for insomnia were identified, notably previous history of physical-ill health, having previous help for insomnia, suicidality and depression. Poor sleep hygiene, maladaptive beliefs about sleep and the problematic prison environment may help to maintain symptoms of insomnia in a prison environment. The current study findings are relevant to informing clinical practice in the screening, assessment and treatment of insomnia. Indeed, our study, alongside wider evidence, could be used as the basis of a clinical pathway to help effectively manage insomnia in prison. Future research is needed to further validate these findings on a larger-scale, using objective measures for sleep.

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**Crossed wires? Prisoner-patient and staff perceptions on insomnia treatment: a qualitative study**

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*Prepared for Social Psychiatry and Psychiatric Epidemiology*

## **ABSTRACT**

### **Purpose**

This study aimed to explore insomnia management in prisons from the staff and prisoner perspectives. Exploring historic, current and future considerations of treatment experience for insomnia in prison was paramount.

### **Methods**

A purposive sample of healthcare and prison staff and prisoners from three prisons were recruited for semi-structured interviews. A thematic analysis was used to extract main themes.

### **Results**

Forty-one interviews were completed. Three main themes were identified that explored insomnia management. Staff and prisoners were in agreement that good sleep was valued in prison, helping mental health, routine formulation and increase daytime productivity. However, achieving good sleep was effected by the barriers for good insomnia management, which included prisoner dissatisfaction in insomnia consultations with staff and misconceptions about medication preferences. Contrary to some staff's opinions, not all prisoners wanted medication to treat insomnia and instead welcomed non-pharmacological alternatives such as self-management and peer support. Collectively participants felt improvement in insomnia management was needed in prison, particularly when prisoners first arrive.

### **Conclusions**

The consequences of poor sleep were seen as low mood, poor productivity and not getting through their prison sentence without significant struggles. Treating poor sleep in prison is complex as not all prisoners want medication and show preference for non-pharmacological interventions but only some staff recognise this. Whilst guided by staff, shifting the responsibility towards prisoners to ensure poor sleep was improved was highlighted as important for future change in insomnia practice. In the future, increased availability of non-pharmacological interventions, encouraging prisoners to take responsibility for their own sleep health and encouraging help-seeking behaviour may be needed to improve insomnia management in prison.

### **Keywords**

Insomnia; sleep; prison; healthcare; non-pharmacological treatment

## INTRODUCTION

Insomnia is generally defined as the inability to initiate or maintain sleep or have early morning awakening, for at least three months, for a minimum of three nights per week, and with daytime consequences (American Psychiatric Association, 2013). In England, around a third of the general population have insomnia (Roth, 2007), however these rates are almost doubled in a prison population (61.6%) (Dewa et al., 2016c). Sleep problems are associated with, and can exacerbate, health conditions such as psychiatric disorders, physical illness, chronic pain and substance misuse, all of which are prevalent among prisoners (Dewa et al., 2016c; Elger & Sekera, 2009; Fazel et al., 2006; Seena Fazel & Baillargeon, 2011). Therefore, identifying and treating sleep problems is of importance in this population.

Prisoners should receive an equal standard of care as available in the wider community, including the treatment of insomnia. Imprisonment offers an opportunity to engage a hard to reach population with healthcare treatment, contributing towards reducing health inequalities (Feron et al., 2005; Marshall, Simpson & Stevens, 2001). However, evidence regarding the management of insomnia in prisons suggests that this may not be the case. A recent national survey examining insomnia management strategies in prisons in England and Wales (n=84) revealed that whilst most establishments routinely offer sleep hygiene advice (94%) and hypnotic medication (88%) to treat insomnia, two-thirds (65%) fail to offer psychological therapies (Dewa, Hassan, Shaw & Senior, 2016b). This contradicts recommendations for chronic insomnia from the National Institute of Clinical Excellence (NICE) for managing insomnia raising questions about the standard of care (NICE, 2015).

The limited evidence base in this area points towards some of the challenges associated with treating and managing insomnia in prison. The constraints of the prison setting, available resources and ethical dilemmas may all interact to complicate decision-making regarding insomnia treatment. For example, Elger (2008) has noted that whilst some prisoners are given medication to treat insomnia, cognitive-behavioural interventions are limited because they are time-consuming and require trained staff; as such some prisoners do not receive any treatment at all. Another challenge is the provision of hypnotic medication in a secure setting. Hassan et al. (2013) explored staff and patient perspectives on the uses of psychotropic medicines in prison, including hypnotics. They found that prisoners valued a variety of medicines with sedative properties. Whilst hypnotic medicines can be given under supervised conditions in prisons to reduce the potential for diversion (i.e. trading, selling and/or misuse), this can mean medicines are taken at inappropriate times (e.g. late afternoon). Consequently, forced sleep onset can disrupt the natural sleep-wake cycle which can encourage daytime sleepiness, early morning awakening, concentration problems and low mood (Lemmer, 2007).

No studies have explored insomnia management in prison from both staff and prisoners perspectives in a single study. Pertinently, there is a need to better understand how prisoners engage with healthcare services in prison to help manage their sleep problems, particularly because of the high prevalence, high number of insomnia related consultations and comorbidity associated with insomnia. This study set out to explore staff and prisoner-patient experience of previous, existent and prospective treatment of insomnia in prison. Specifically, we queried:

- How do prisoners engage with healthcare staff in helping their insomnia in prison?
- How could the management of insomnia in prison be improved?

## **METHODS**

### **Setting**

Three adult prison establishments from North England were included in the study. Two establishments were medium security prisons for men, whilst the third prison housed only women. These were invited to represent a range of prisoners including those who were awaiting trial, unsentenced and sentenced prisoners. The study was approved by the National Health Service (NHS) Research Ethics Committee for Wales (REC) (ref: 13/WA/0249); the National Offender Management Service (NOMS) (ref: 2013-208); local research governance boards; and prison governors from each participating prison.

### **Participants**

This was a qualitative study using semi-structured interviews with prisoners and staff. A purposive sampling strategy was adopted, inviting a range of staff and prisoners to take part (see Table 1). The first author [LD] liaised with healthcare managers to identify suitable members of staff who a) had contact with prisoners and b) dealt with sleep problems in some capacity. Gatekeepers were used to help advertise the study to their staff, including mental health nurses, pharmacists and GPs. Follow-up emails were used to further promote the study. A snowballing approach was then utilised to invite staff who were initially interviewed to identify other potentially suitable interviewees.

Prisoners with insomnia were recruited predominantly from the quantitative arm of the study being conducted concurrently to establish the prevalence of insomnia among prisoners (reported elsewhere, see Dewa et al., 2017b). Participants were approached to take part in interviews if they; had possible insomnia disorder, based on low scores from the Sleep Condition Indicator (SCI; Espie et al., 2014); and/or had reportedly asked for help for insomnia in prison; and/or had historic substance misuse. Priority was given to the first two criteria.

In some cases, if no prisoners were available who had taken part in the quantitative arm of the study, gatekeepers were approached to recommend prisoners that met the above criteria. In addition, prisoners who had presented with insomnia in the last year were identified from healthcare records. In such cases priority was given to prisoners who had presented with insomnia *and* had received medication for insomnia. The final sample of participants included 28 prisoners and 13 staff.

Table 1: Interview sample characteristics

<b>Prisoner</b>	<i>N</i>	<b>Staff</b>	<i>N</i>
Gender		Prison type	
Male	17	Male medium security prison 1	6
Female	11	Male medium security prison 2	2
		Female prison	5
Age range	20-67		
		Staff role	
Prison type		Pharmacist	2
Male medium security prison 1	9	Psychological Wellbeing Practitioner	2
Male medium prison 2	8	Mental health nurse	2
Female prison	11	Substance misuse worker	1
		Advanced nurse practitioner	1
Insomnia		Mental health lead	1
Yes	19	GP	1
No	9	Clinician matron	1
		Prison governor	1
Asked for help for sleep problems		Healthcare manager	1
Yes	21		
No	7		
History of substance misuse			
Yes	18		
No	7		
Unknown	3		
Total	28		13
	<b>28</b>		<b>13</b>

### Procedure

Interviews took place between December 2014 and June 2015. Informed written consent was obtained from all participants and then individual semi-structured interviews were completed. All interviews were conducted by the lead author [LD] in a private room

and were audio recorded. Interviews continued to be scheduled until data saturation was reached. Data saturation was reached when no further new information was found.

### Data analysis

Interviews were transcribed verbatim and subjected to thematic analysis by the lead author [LD] (Braun & Clarke, 2006) The second author reviewed a selection of transcripts to ensure quality of coding. Six stages were completed: 1) familiarisation; 2) initial coding; 3) theme search; 4) theme review; 5) theme definition and naming and 6) selection of appropriate data extracts. NVivo was used to help manage the data (QSR International Pty Ltd, 2014).

## RESULTS

Three main themes were identified with composite sub themes that illustrated prisoner and staff's views about insomnia management in prisons (Table 1).

Table 2: Themes

Theme	Sub-themes
<b>The value of good sleep in prison</b>	'Doing your sentence' 'Sleeping away your jail' Perceived consequences of poor sleep
<b>Barriers and considerations for good insomnia management</b>	Misconceptions about medication preference Dissatisfaction with responses to requests for help
<b>Future direction of insomnia management in prison</b>	Integration and co-ordination of services Taking responsibility for helping themselves

### The value of good sleep in prison

#### *'Doing your sentence'*

Staff and prisoners agreed that good patterns of sleep were important to functioning well in prison. Staff were often keen to encourage inmates to establish a daily routine, part of which included and encouraged good sleep.

"Getting into a routine, we do encourage gym, education and things like that. So it can help" (Mental health nurse 13)

Many prisoners welcomed this and some experienced a noticeable improvement in their sleep once they were in a set routine, getting up and going to bed at a certain time,

having exercise and going to education every day, which was usually after a considerable period of time in prison.

“Believe it or not I feel happy...I think that’s because also in here I’ve got routine. On the out I didn’t so, if I didn’t sleep very well I’d stay in bed and try and catch up on my sleep.”  
(Female prisoner 11)

Part of the rationale for getting into a routine was that staff wanted prisoners to ‘do their sentence’ – get through it adequately - and appropriate patterns of sleep were important to ensure this. Daytime activities whilst being incarcerated can include going to work, attending educational classes, and interacting socially with other prisoners, friends or family members. Both staff and prisoners saw sleep as an important precursor to enabling effective participation in such activities.

“It’s going to affect how you behave during the day. Your concentration. Erm, it affects your activities your work here.” (Male prisoner 16)

“If somebody is getting restful sleep then they are feeling a little bit better in themselves you know in terms of physically the next day you’re able to actually work with somebody and not feel so tired...So getting a restful night’s sleep is important for them to be able get on and do the sentence.” (Mental health nurse 13)

#### *“Sleeping away your jail”*

Staff and prisoners both valued sleep, acknowledging that being busy and having a routine and set schedule could give the sense that days pass quicker. However, some prisoners acknowledged another agenda, placing value on sleep as a driver for getting through their sentence as quickly as possible. For example, certain prisoners described a logic whereby sleep was used as a method to “speed up” their sentence, reducing conscious periods in prison and therefore making prison faster and ‘easier’.

“It takes the time away doesn’t it...If you get 6 months and you sleep for half of it, you only do 3 months because you’re asleep for the other 3 months. So the longer you are asleep the less you’re in jail”. (Male prisoner 25)

Whilst in the minority, a few prisoners felt that staff were opposed to ‘oversleeping’ and ‘sleeping away their sentence’. Indeed, they indicated staff wanted them to feel the full extent of their imprisonment. In this context, they saw being awake as a deliberate punishment to ensure they experienced the full impact of incarceration.

“I feel like generally in prison they want you to work as much as possible so that you are “feeling the jail”... To say that you could fall asleep at 7 o'clock and get up at dinnertime



then you slept all that time then you are not feeling the jail are you? Do you know what I mean? It seems [they] get you up as early as possible so you are feeling the jail.” (Male prisoner 24)

#### *Perceived consequences of poor sleep*

Both staff and prisoners acknowledged the consequences of not sleeping well in prison. To prisoners, not sleeping well could include having broken sleep, waking early and unable to go back to sleep, not being able to “drop off”, not having a continuous sleep and feeling “groggy” during the day. Poor sleep, however defined, was perceived to affect a wide range of factors relating to physical health, mental health and ability to function, including mood, anxiety, concentration, irritability and agitation. To staff, poor sleep was viewed as most problematic when daytime functioning was visibly affected. One male prisoner who’d spent most of his life in prison described a wide range of consequences, which emerged when he was not getting enough sleep in prison.

“Always angry, I was ratty. Moody. Chaotic. Hurtful. Depressed. Anxiety. Depression. Mental health problems. It was all that” (Male prisoner 25)

Notably, both staff and prisoners highlighted the potential risk for increased aggression when inmates were not sleeping well.

“The less sleep they have the more obsessed they become with it. And it’s going to affect them. And I think we do see that quite a lot...may be disguised as other things: aggression, agitation, so say they are getting into a fight or being verbally aggressive with staff. They won’t look at the underlying concept straight away.” (Primary nurse 11)

“It might reduce the stress they’ve got and reducing the stress they’ve got...like with me I get angry. Ya know what I mean? I snap quite easily. If I was sleeping I wouldn’t be snapping as much. I might not be fighting.” (Male prisoner 20)

Staff and prisoners both acknowledged the relationship between sleep and mental health. Even in the context of a complicated clinical and situational picture, many prisoners felt that poor sleep contributed to their low mood. On some occasions, the topics of self-harm and suicidality were highlighted during interviews as potentially being linked with poorer sleep.

“It’s got to contribute towards ACCTs<sup>18</sup>. It’s got to have some effect on the long-term mental health if you awake every night I am certain” (Clinical matron 2)

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<sup>18</sup> Assessment, Care, Custody and Teamwork document that is opened in response to concern for self-harm or suicide of a prisoner

“...there was a lad who killed himself yeah...you can look at it anyway you want but people need to sleep do you know what I mean? People do struggle. People need to listen. It makes me frustrated...he was depressed because he wasn't sleeping. He was struggling sleeping and he had problems on the out. If you are that low...no sleep, you not gonna be thinking straight. So when I heard he passed away it just made everything like hit home with me you know?” (Male prisoner 14)

### **Barriers and considerations for good insomnia management**

#### *Misconceptions about medication preferences*

All prisoners were asked what they would advise to another inmate to improve their sleep. The majority suggested dealing with the sleep problem themselves through non-pharmacological methods they had tried themselves in the past, including distraction, relaxation and deep breathing techniques (e.g. counting sheep, putting music on, reading a book, having a warm drink before bed). Only a few spontaneously recommended medication. This seemed to be based on past experience where they'd had success in using medication to improve their sleep or it had been prescribed by their GP in the past. However, whilst some found it had been effective in the past, most did not want to take it now.

“I think it got that bad when I wasn't sleeping, they put me on a low dose of zopiclone. 3.5. [sic] of that. I take that like a last resort if I'd had a week or two weeks of not sleeping I'd take one. But it was only like a last resort” (Female prisoner 3)

“it's worth trying other techniques rather than medicating yourself a lot. Because when you come off the medication you're not sleeping again so you're back to square one. So what's the point? (Female prisoner 2)

Nonetheless, there were exceptions. One prisoner suggested drugs were “all [she'd] known” and the only intervention that she had tried to help improve her sleep. A few also saw self-medicating using non-prescribed or illegal substances as a potential solution, particularly when refused medication by the GP. In particular, a cannabis-like psychoactive substance known as ‘Spice’ was highlighted as a problem in the prisons by two male prisoners.

“...people would ask for a spiff of spice and that will sort them out and go to sleep” (Male prisoner 23)

“I guarantee 90% of prisoners will take mamba, smoke mamba: spice, to get asleep. And that's become a big problem...a lot of people say they are taking it to get high, but mamba helps you sleep. It's a known fact. And everybody says it doesn't but it is...90%

of people. They are using some sort of medication illegally or drugs illegally to help them sleep” (Male prisoner 25)

Some prisoners’ responses indicated that they thought staff were under the belief that most prisoners were “drug seeking” and wanted medication, not only to treat genuine cases of insomnia, but also to trade, sell or misuse. Whilst this belief was borne out in the responses of some staff, others were more trusting.

“I do get complaints about the prescribing of medication because obviously some patients want to use medication as a form of trading or want to be on medication permanently” (Pharmacist 6)

“[There are] a lot of interventions but the first things the girls will say is “I want some medication” ...some of them are really good but a lot of them automatically say, “No I need tablets”. They have high expectations” (Mental health nurse 4)

“They don't always wanna take tablets. They just want to deal with the problem that is causing them not to sleep” (Mental health manager 1)

Nonetheless, some staff did acknowledge that prescribing medication saved them time and was an easy intervention to implement.

“I think it is very easy...because of time constraints and that kind of thing I think it’s easy to go straight to the drugs and that’s what the girls want half the time” (Pharmacist 3)

#### *Dissatisfaction with responses to requests for help*

Many prisoners reported having asked for help for insomnia during their current sentence. From prisoner descriptions of their encounters with health care staff, it seemed typical that prisoners who presented with sleeping problems at healthcare consultations arrived with an expectation of the healthcare professional helping them but often left dissatisfied with the outcome.

“I felt withdrawn really. It's like how am I going to get to sleep? I really need my sleep. I wasn't going to argue with them because I am not like that so. If it is there choice it's their choice.” (Female prisoner 9)

Others avoided asking for help altogether because of past disappointing consultations.

“There’s no point talking to them about it. Coz it’s not gona lead to anything” (Female prisoner 27)

All prisoners were asked what they would have liked to happen in the consultation. The majority asked simply to be listened to more and to ask more questions about why they were experiencing the sleep problems. A few also wanted to be asked about familial insomnia and to be given alternatives to medication.

“Just some information to put my mind at ease because if I think... I dunno... to ask me questions to say aww if it runs in your family or ya know, anything, something so that I get some information out of it. Which... I've been asking for the answers and no one has even helped me.” (Male prisoner 23)

### **Future direction of insomnia management in prison**

#### *Integration and co-ordination of services*

All participants were asked about how insomnia management could be improved in prison. The majority felt improvement was needed because of the perceived high prevalence of insomnia and level of unmet need. Staff largely restricted their proposals for improvement to using pre-existing methods and interventions that they were already familiar with (e.g. medication) albeit, integrating care more systematically within the existing prison setup.

“I think there should be a more structured way of doing things about looking at sleep issues...I think maybe there should be a pathway in place, you know that once we've got them through what the guidance will say, they'll go onto the next level and next level about sleep stuff...[then] refer them to people who are maybe sleep specialists” (Mental health lead 1)

One critical area that prisoners and staff felt needed to improve was help for prisoners when first arriving into custody. Many prisoners reported that they were not asked about sleep or given an indication of what help was available on entry to prison. Some prisoners suggested integrating this information into the induction.

“When you first come into prison you see people won't ya? You go and see someone from this that and the other, make it an induction...for someone for sleeping. Ask them...on the spot, “*What's your sleeping like?*” “*Prison's like this...*” “*Have you been on medication in the past?*” (Male prisoner 14)

#### *Taking responsibility for helping themselves*

Some staff wanted prisoners to take responsibility over their own sleep because they felt they relied too much on healthcare to help them.

“They've got to take some responsibility as well I believe and I don't think some of them do. Some of them are really good but...they have high expectations. Do it. Mend me. Well what can you do? And they won't do the work and that's sad” (Staff 4)

In direct contrast, prisoners themselves reported actively deploying multiple strategies to self-manage their sleep problems, for example by listening to relaxing music and having hot drinks before bedtime. They welcomed the opportunity to take responsibility for their own sleep health.

“I tend [to] deal with my own problems. Suffer in silence sort of person. I am a very prideful person...I don't mind asking for help...[but] I would rather try and cure it myself if that makes sense?” (Male prisoner 21)

Numerous methods were suggested to encourage a sense of empowerment and independence among prisoners when dealing with sleep problems, including peer support and guided self-help. Guided self-help was identified as a method that gave structured support, without relying on one-to-one treatment from healthcare. Staff routinely recommended leaflets; however, despite being readily available, leaflets were not well received by prisoners.

“I kept being giving different booklets for ways round it and that...It was a booklet stapled together with three pieces of paper in it...It was just a booklet. I didn't read it” (Male prisoner 27)

In contrast, prisoners were more positive about peer support. Communication from someone who had direct experience of successfully dealing with poor sleep in the past was one possible strategy that was considered to improve insomnia management.

“They can relate and say “yeah he's awake at 3 o'clock they but look what he's done”. He's put suggestions out. OK. While you try this one. Try that you know it gives that sort of hope. Shall I say? Helping people better themselves because of seeing that as a problem and a problem shared” (Male prisoner 19)

## **Discussion**

### **Statement of principal findings**

This study sought to better understand how staff and prisoners perceive the management of insomnia in prison. Three main themes were found: The value of good sleep in prison, barriers and considerations for good insomnia management and future directions of the management. Both staff and prisoners viewed good sleep as being important for mental and physical health, rehabilitation and to help formulate a routine.

Nonetheless, getting help for poor sleep was avoided by some prisoners due to dissatisfaction in previous consultations about insomnia. Almost all prisoners saw the value in having greater access to non-pharmacological treatment for insomnia and not just medication. They also indicated that they would welcome opportunities to take more responsibility over managing their own sleep. This was in contrast with the opinions held by some members of staff, who thought they did not want to take responsibility for their own sleep health. Given these findings, there seems to be a lack of understanding and miscommunication between staff and prisoner expectations and perception on the treatment of insomnia.

### **Strengths and weaknesses of the study**

Uniquely, this study has explored insomnia management from both staff and prisoner perspectives, particularly regarding engagement with healthcare services. By comparing staff and prisoner perspectives, our study has deepened understanding of attitudes towards insomnia and its management in prison, thereby contributing to the evidence base. Use of purposive sampling ensured we recruited staff participants that had varied backgrounds and cut across different disciplines including prison governance, mental health, substance misuse and primary care. Among the prisoners we sampled, we took care to include good and poor sleepers, men and women and people with differing experience of insomnia consultations. This participant selection illustrates diversity of viewpoints and provides depth. However, it was a reasonably small sample (n=41) and only selected prisons from North England were included. Experience and perspectives may be different in other countries or establishments such as high secure prisons or young offender institutions (<18 years old), where treatment needs maybe different (Richards, 2011). Therefore, our findings might not be transferable to other settings. Furthermore, at times we were reliant on staff to select prisoners who they considered appropriate for interview. Therefore, we potentially missed prisoners who could have had different perspectives, for instance those who were deemed to be a risk to staff.

### **Comparisons with existing literature**

The body of qualitative research that has explored the subjective experience of insomnia and its treatment in community studies is increasing. A systematic review found 22 qualitative studies had good methodological rigour (Araujo, Jarrin, Leanza, Vallieres & Morin, 2016). The authors concluded that taking account of the patients' experience of insomnia is vital to deliver appropriate treatments. In our study prisoners seemed to have a preference for non-pharmacological interventions; this was in-line with the preferences of patients in various other populations including veterans, hospitalised patients and the wider community (e.g. Azad et al. 2003; Morin et al. 1992; Omvik et al. 2010). Indeed, 80.3% of a large Norwegian community sample (n=2645) wanted to try non-pharmacological alternatives despite experience taking hypnotic medication. However, there were a few that preferred medication thus possible patient preference

differs per individual. This was usually based on past experience. Cheung and colleagues (2015) further argued, we can't conclude either way as patient treatment preference is actually mixed and is dependent on factors such as treatment acceptability. Offering an individualised management plan that is relevant to the prisoners' needs would be a good step towards improving insomnia management.

### **Meaning of the study: possible mechanisms and implications for clinicians or policymakers**

Insomnia is a public health concern (Dement & Pelayo, 1997) but as yet is not included in UK government strategy (*Public Health England Health & Justice report 2014 About Public Health England*, 2014). The findings of this study suggest insomnia is also a public health concern in prisons, not in the least, the consequences towards mental and physical health, behaviour and accidents. Therefore giving a new staff emphasis on achieving good sleep in prison is likely to reduce potential consequences of poor sleep and also help to improve daytime functioning. Healthcare prison staff could evaluate indirect and direct costs associated with insomnia in prison in order to understand the full impact of good insomnia treatment.

Staff who support prisoners to take part in activities, employment and social interaction could help prisoners get into a routine that could potentially have a positive effect of their sleep, changing the prisoner mentality of 'sleeping away their jail'. Notably, based on prisoners' dissatisfaction with responses to requests for sleep help, encouraging help-seeking behaviour, reassuring the patient and offering non-pharmacological alternatives to medication is needed. However, to achieve this some staff will need to change their mind-set and acknowledge that not all prisoners will prefer or desire medication. Developing an individualised care plan that integrates patient preference, non-pharmacological treatment, and gives attention to the transition from community and the first few weeks in prison may be a good next step in helping to improve insomnia management and prisoner quality of life. However, staff awareness of insomnia as an important condition and increased availability of medication alternatives will be required to make this a reality.

### **Future research**

Our study provided an in depth account of staff and prisoner attitudes towards insomnia management, in particular how prisoners engaged with healthcare professionals. As we are the first to explore staff and prisoner perspectives on insomnia management in prison, comparative studies with staff and prisoners from other areas of the UK and types of prison are needed. In addition, it would also be advantageous to observe the staff-patient consultation to further extend ecological validity and provide additional insight to further develop understanding. Future work is required to improve strategy

development by potentially designing a new treatment approach to managing insomnia in prison whilst incorporating both staff and patient perspectives.

### **Conclusion**

At some point during their time in custody, prisoners are likely to have trouble sleeping. Both staff and prisoners considered good sleep was valuable in prison, particularly as a way of getting through the sentence. Taken alongside the findings of wider literature, the findings of this study indicate that managing insomnia in prison is complex and prisoners don't just prefer medication, but are open to non-pharmacological treatments that include self-management techniques and only some staff realised this. Overall there seems to be poor understanding on the expectations and perception on insomnia management that may impact negatively on the staff-prisoner relationship. Resolving these misunderstandings may go some way towards improving this relationship, alongside greater transparency, communication and understanding.



**The design of a treatment pathway for insomnia in prison: a modified Delphi study**

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*Prepared for BMJ Open*

## ABSTRACT

**Objective:** Insomnia is highly prevalent in prison populations but there is currently no standardized treatment approach in place. The study aim was to produce an evidence-based pathway acceptable to staff and prisoners.

**Design:** A modified Delphi technique was used with stakeholders over three rounds.

**Participants:** We invited academic sleep researchers, prison staff and service users to comment on a treatment pathway.

**Results:** In round 1, 15 stakeholders took part and gave their general opinion about the pathway. In round 2, 13 participants responded. There were six statements of contention including the inclusion of sleep observations, sleep restriction therapy and promethazine. Consensus was high (>80%). All participants who took part in round 3 agreed on the final pathway (n=13). The final treatment pathway comprised a standardized-evidenced based stepped-care approach for insomnia in prisons. The pathway resulted in five main stages: 1) transition from community; 2) detection and assessment; 3) treatment for short-term insomnia; 4) treatment for long-term insomnia and 5) transition from prison to community or another establishment.

**Conclusions:** The pathway helps healthcare professionals manage insomnia in prison populations. It could help make a substantial difference in reducing the large number of sleep complaints and positively impact upon staff, prisoners and the prison environment.

### Strengths and Limitations

1. The first modified Delphi study to produce a treatment pathway for insomnia in prison
2. Diverse group of experts represented different viewpoints necessary for pathway acceptability. Service users residing in prison were active in helping pathway development.
3. Only women prisoners were included in the service user group. Men, older prisoners and those from higher secure prisons were not consulted.
4. Service user and staff experts likely knew each other so may have conferred and influenced each other's opinions.

## INTRODUCTION

Good sleep contributes positively to overall health, well-being, social functioning and quality of life (Kyle et al., 2010). Around a third of the general population experience insomnia at some point in their lives (Roth, 2007). Prevalence rates for insomnia in prison are considerably higher than in the general population (Dewa et al., 2015; Ohayon, 2002). In a recent English study, 88.2% of prisoners experienced poor sleep quality and 61.6% had probable diagnosable insomnia, mostly chronic (Dewa et al., 2016c; Elger, 2004b). Insomnia has been shown to significantly contribute to poor cognitive functioning, emotional dysregulation, aggression and lack of treatment engagement, all of which may affect the safe running of the prison, an individual's rehabilitation and, ultimately, the likelihood of re-offending (Alhola & Polo-Kantola, 2007; Baglioni, Spiegelhalder, Lombardo & Riemann, 2010; Barker et al., 2016; Kamphuis et al., 2012).

National Institute for Health and Care Excellence (NICE) guidelines for treating acute insomnia recommend non-pharmacological interventions in the first instance, followed, if necessary, by a short course of hypnotic medication (NICE, 2015). For chronic insomnia (symptoms for >3months), medication is not usually recommended; instead cognitive behavioural therapy for insomnia (CBTi) is considered the gold standard treatment (NICE, 2015; Qaseem, Kansagara, Forcica, Cooke & Denberg, 2016). However, a recent survey reported that prisons in England and Wales do not routinely implement NICE guidance for managing insomnia (Dewa et al., 2017a). Whilst sleep hygiene education was commonplace, offered in 94% of establishments, only one prison from a sample of 84 offered CBTi (Dewa et al., 2017a). Furthermore, notwithstanding guidance advising against their use, hypnotics were commonly prescribed to treat chronic insomnia (Dewa et al., 2017a). This study was followed up with in-depth qualitative interviews to further understand staff and prisoner-patients' experiences of insomnia treatment and to explore the future direction of insomnia management in prison (Dewa, Hassan, Shaw & Senior, 2017c). In a purposive sample of 28 prisoner-patients and 13 staff, staff felt prisoners should take personal responsibility for managing their insomnia whilst prisoners felt structured peer support would be a valuable approach. This current lack of a standardised, evidence-based approach to treatment has both individual wellbeing and financial implications, including costs to the NHS due to increased prescribing and impact on healthcare utilisation. Additionally, the lack of adherence to NICE treatment standards is at odds with the now longstanding policy that healthcare provision for prisoners should be equivalent to that provided to the wider community (Joint Prison Service and National Health Service Executive Working Group, 1999).

There is, therefore, a need for a modernisation of insomnia management in prisons, to rationalise the prescription of hypnotics and introduce evidence-based psychosocial

treatments, with the objectives of improving wellbeing, lessening health and security risks and potentially improving staff-prisoner relationships.

In order to contribute to this agenda, we conducted a modified Delphi study to develop a bespoke, evidence-based, stepped-care pathway for prison-based insomnia management to guide practitioners and improve care for patients.

## **METHODS**

A modified Delphi technique was used to develop a treatment pathway for insomnia in prison. The Delphi method is an iterative process in which a group of expert stakeholders come to a structured consensus view on a particular topic through a number of rounds of feedback with controlled feedback. Delphi studies have been successfully conducted to improve healthcare guidance in a number of settings, including, similar pathway developments in the health and criminal justice systems (Elwyn et al., 2006; Hsu & Sandford, 2007; Keller et al., 2015; Kouyoumdjian et al., 2016; Noga et al., 2014).

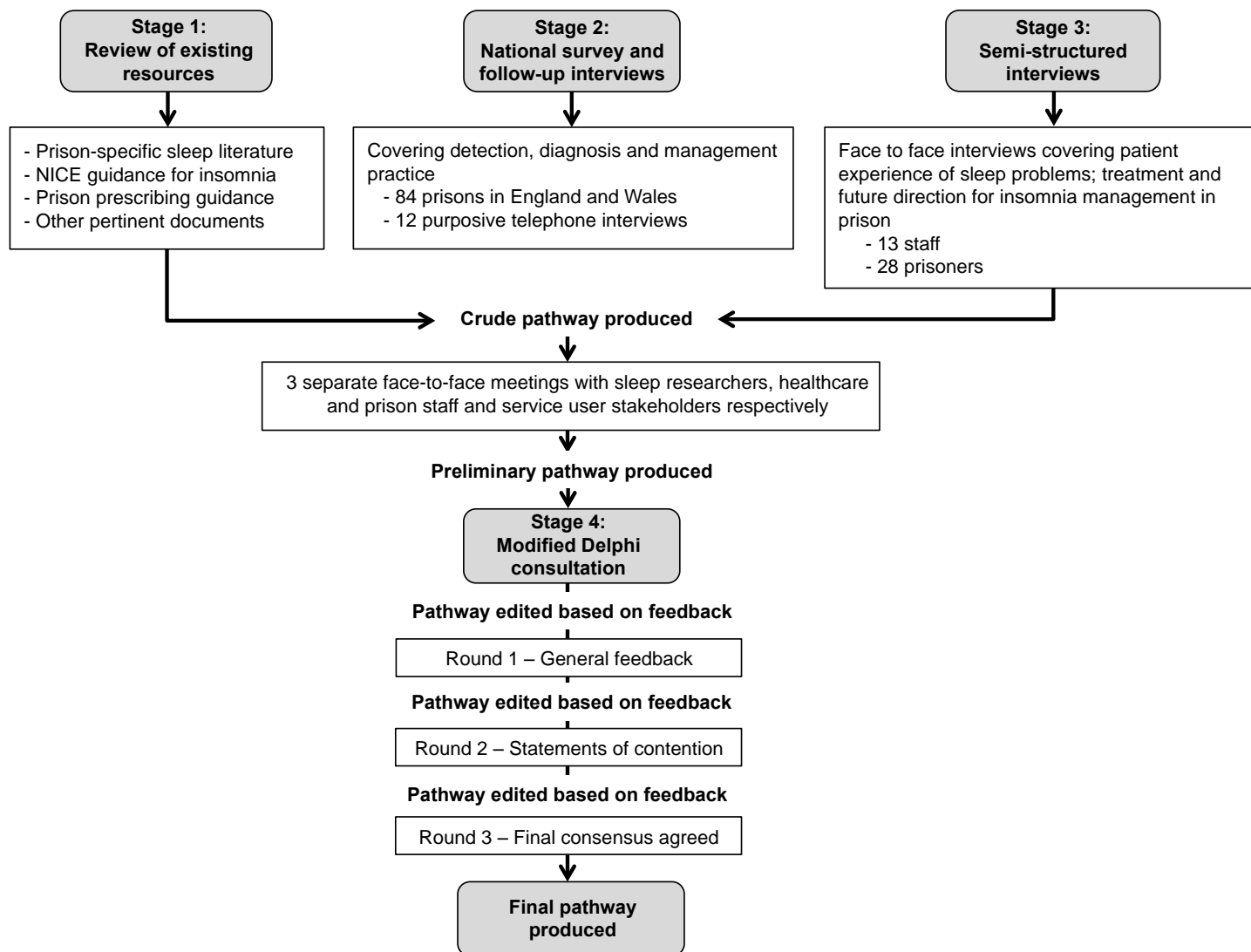
The method involves consecutive rounds of structured consultation to reach participant consensus on the content, style and focus of the subject under discussion, in this instance the insomnia treatment pathway. Data are gathered over several rounds of consensus and fed back to participants to allow on going re-evaluation. In this instance in particular, consensus was sought how delivery of treatment might be affected by being delivered in the prison environment, how best to treatment to potentially 90% of the prison population and how people should identify as having a problem. There is no mandated number of rounds required to complete a Delphi consultation; the process is repeated until consensus is achieved. The conduct of at least two rounds of feedback is deemed commonplace (Day & Bobeva, 2005).

To produce a preliminary pathway, findings from the authors' earlier research were triangulated. This included the systematic integrative review of published literature on insomnia in prison (Dewa et al., 2015); learning from a questionnaire survey and in-depth qualitative interviews with prison health and discipline staff and prisoners about the current treatment of insomnia (Dewa et al., 2017a, 2017c); and a prevalence study of rates of acute and chronic insomnia in a sample of English prisons (Dewa et al., 2017b). The preliminary pathway then went through an initial review by a limited number of academic sleep researchers, prison staff and prisoners.

The revised pathway was then reviewed by a range of relevant informants in the formal Delphi consultation process. Participants were invited to contribute based on their professional or service user expertise. Traditionally in a Delphi study, experts do not

know each other, do not work or live together and usually respond to consensus rounds via email or other electronic means. This was not possible for service users. Due to a lack of access to electronic communication and, to fit within the resources of the study, the lead author [LD] met with a group of women service users in prison over a series of three face-to-face meetings in order that their important views could be fully incorporated.

Feedback from participants was mainly qualitative and therefore analysed in NVivo v.10 (QSR International Pty Ltd, 2014). Responses were characterised according to emerging themes, with similar responses grouped together to determine levels of consensus. Amendments to the pathway were made after each round of feedback and participants were provided with the revised pathway along with a summary of the results from the previous stage and a number of new questions/topics to be considered. The provision of summary results allowed participants the opportunity to re-evaluate their views in the wider context and further explore areas of significant disagreement



**Figure 1:** Stages performed to produce final pathway.

## RESULTS

### Producing the preliminary pathway

Two sleep researchers, three prison staff and six prisoners reviewed the preliminary pathway. Consultees described the pathway as comprehensive and detailed, but vast. There were concerns about over medicalization of insomnia. Indeed, it was identified that GPs were given too much responsibility to detect, diagnose and treat the insomnia, whereas other teams such as primary care nurses and Improving Access to Psychological Therapies (IAPT) team were given minimal responsibility. There was an acceptance that insomnia was a widespread issue so help should be available and on-going, that people might need different interventions depending on their length and/or stage of custody.

The research team then made a number of initial modifications to the pathway and layout orientation, to increase linearity and to specifically focus on insomnia rather than including additional conditions that were comorbid with insomnia. It also redirected early interventions away from GP involvement and towards IAPT and primary care services. Continuing support was considered in the form of regular reviews of treatment progress, a prescribed sleep pack (e.g. ear plugs, Horlicks/hot chocolate and sleep leaflet) and trained service users, available to give continuous support.

### Producing the final pathway

Two academic sleep researchers, three service users, two healthcare managers and one GP carried through to the Delphi rounds. The rest of the Delphi was made up of one academic, one GP, one primary care manager, one healthcare manager, one mental health lead, one IAPT worker and one prison governor (see Table 1).

**Table 1:** Retention of Consultees by Delphi round

Consultee	Round 1	Round 2	Round 3
Academic sleep researcher	3	3	3
Service user (prisoner)	3	2	2
GP	2	1	1
Healthcare manager	2	2	2
Primary care manager	1	1	1
Psychologist	1	1	1
IAPT staff member	1	1	1
Mental health lead	1	1	1
Prison governor	1	1	1
<b>Total</b>	<b>15</b>	<b>13</b>	<b>13</b>

#### *Delphi round 1*

Participants were asked to give their initial overall reactions to the pathway and to make comments on any parts upon which they had an opinion. This was done without them being asked any specific questions about the pathway; rather they were provided with overall

instructions, to allow independent and novel thoughts to be gathered without limitation to particular parts of the pathway. Three service users gave feedback face-to-face and thirteen stakeholders responded via email.

Service users felt the pathway was clear, covered points discussed in their previous meeting and that there was much scope within it for self-management. Several consultees, including the service users, expressed concern about having hypnotic medication in the pathway. Reasons for this included security concerns, patients gravitating towards medication over non-pharmacological intervention and, in the case of one particular medication in common current usage, promethazine, no evidence of its effectiveness. Sleep researchers highlighted limited evidence for mindfulness and sleep hygiene education, noting too much emphasis on sleep hygiene. In contrast, CBTi was not included at all and the academic sleep researchers felt this was a limitation. Others felt self-directed help (sleep diaries, sleep packs, exercise in cell etc.) was needed. Whilst all consultees agreed insomnia screening was important they disagree on who should do it: a trained service user or by a healthcare professional as part of the existing well-man/woman assessments completed soon after reception into custody<sup>19</sup>. Finally transition periods were also highlighted as important times where help is especially needed.

In response to comments about medication we made these changes to reflect the feedback given above. Hypnotic medication featured in the pathway but only to be used when an acute stressor is present. NICE does not recommend promethazine because of lack of evidence of its effectiveness, however the drug is endorsed in the *Safer Prescribing in Prison* document, guidance that is designed for the prison environment (NICE, 2015; Royal College of General Practitioners & Royal Pharmaceutical Society, 2011). Thus, although concerns over promethazine continued, it was still included as part of initial treatment. With regard to non-pharmacological interventions, emphasis on sleep hygiene was reduced and only included within service user advice, sleep packs and as a component of CBTi. "Sleep packs" comprising of expectation management<sup>20</sup>, tailored sleep hygiene and what to do if prisoners have a sleep problem, were added as a resource primarily at initial reception but to be revisited throughout prison stay. Additional changes included the removal of prison officer sleep observations, care plan development brought earlier in the process and the insomnia screener completion by trained service users.

### *Delphi round 2*

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<sup>19</sup> Existing care document that every prisoner receives on entry to prison

<sup>20</sup> Normalising the acute sleep disruption as part of the transition to a new sleeping environment including awareness of prison related noise.



Round 2 adopted a more directive approach. Participants were provided with summarised feedback from round 1 outlining points raised and subsequent changes to the pathway. Feedback was structured in the form of statements to be scored using a Likert scale. Each statement was assigned a 4-point Likert scale (totally agree, somewhat agree, somewhat disagree, totally disagree). Individuals were asked to score each one and make additional comments on any remaining contentious issues. Consensus was achieved if participants indicated somewhat agree or totally agree.

Consultees agreed sleep packs were a good idea, that peer support should be included and that reliance on sleep hygiene as a single component should be reduced. There was disagreement regarding the inclusion of sleep restriction therapy alone (i.e. limiting time in bed to the average self-reported sleep time slowly increasing time in bed as sleep improves), that service users should conduct insomnia screening and the inclusion of promethazine. The majority from round 1 responded in round 2 (n=13; 87%). Statements of contention are described in Table 2. Consensus was defined as at least 70% agreement (totally agree or somewhat agree) across each statement, in line with guidance (Fink, Kosecoff, Chassin & et al., 1984). Consensus was high (>80%) for all statements. Each resolved issue was incorporated into the pathway.

**Table 2:** Consensus on second round of Delphi, n=13.

Statement of contention	Consensus
Sleep observations should not be taken as verification of the sleep problem	13 (100)
Sleep restriction therapy (SRT) should be included	13 (100)
Promethazine should be excluded	12* (100)
Pharmacological intervention should be used in special circumstances only	13 (100)
Screeener for sleep disorders other than insomnia should be included	13 (100)
Trained service user will conduct insomnia screen	11 (85)

\*Total number responded.

### *Delphi round 3*

As no further changes were needed and there were no more contentious issues contributors were only asked to score the single statement: “You are happy with the final pathway” on the scale described above. If consensus was not reached, a final round was planned to resolve any contentious issues but as all consultees who took part in round 3 agreed on the final pathway (n=13; 100%) and no further changes were needed, no further rounds were necessary. The final pathway is displayed in Figure 2.

## **DISCUSSION**

### **A statement of principal findings**

A stepped-care approach that encompasses the most effective but least intensive interventions can help ensure acceptable insomnia care (NICE, 2011). We have now produced a comprehensive treatment pathway based on research and clinical evidence, further modified until consensus was reached by a range of stakeholders. The key steps in the pathway are briefly: 1) transition from community, induction and first period in prison; 2) detection and assessment; 3) treatment for short-term insomnia; 4) treatment for long-term insomnia; and 5) transition management to the community or transfer to another establishment.

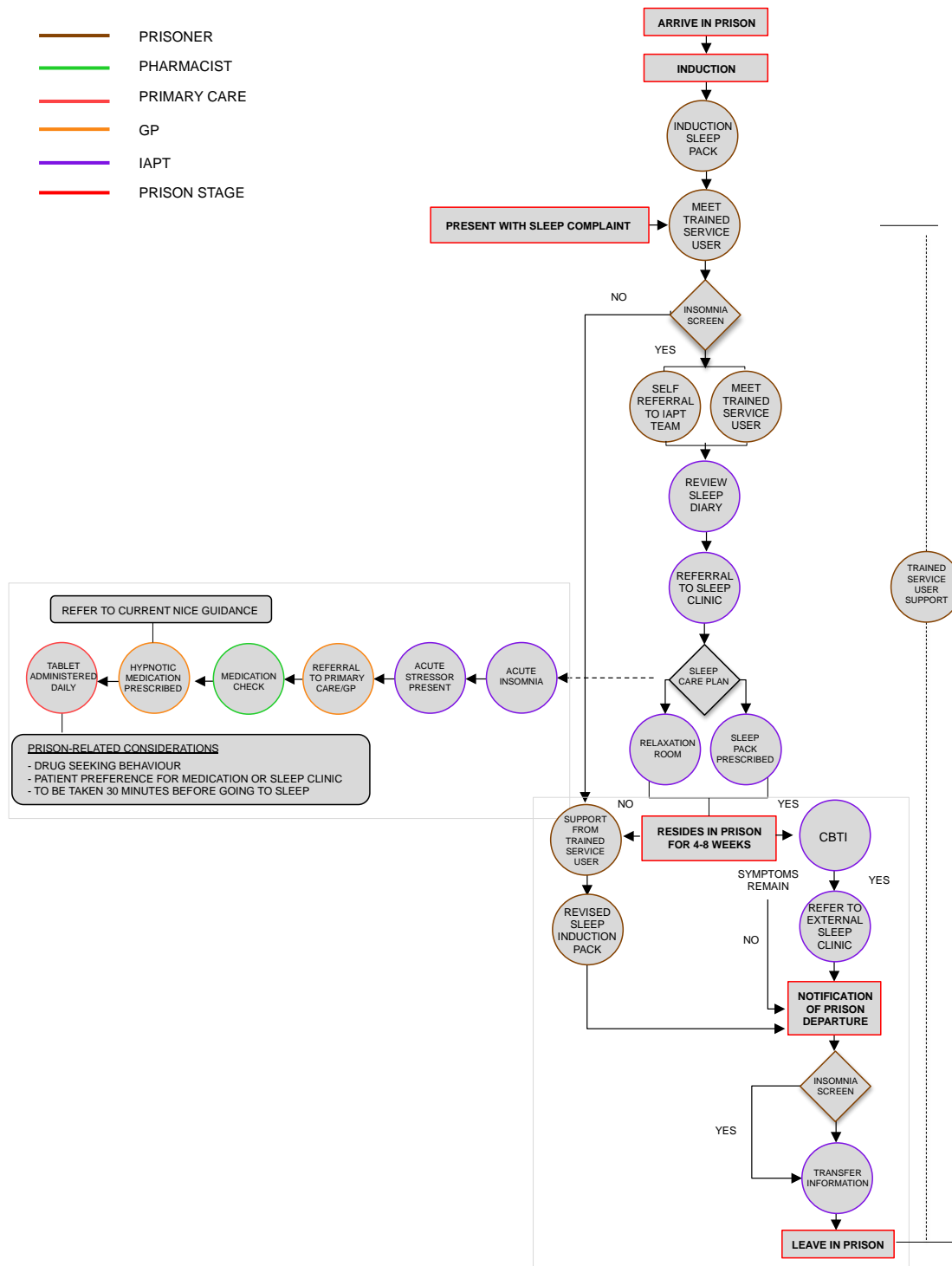
The overarching principle is that insomnia is detected early in the prison term with early intervention. There is a large emphasis on self-management, peer group involvement and psychological approaches as opposed to medication. The SCI (Espie et al., 2014) based on DSM-V criteria, was included to screen for insomnia because it is simple, short and easy to use indicating an ease of integration into future prison practice. Hypnotic medication may be offered when acute short-term insomnia is present accompanied with an acute stressor. For example, the patient may have experience of bereavement, unexpected or long sentence. If chronic insomnia is detected prisoners, CBTi is indicated as part of their long-term insomnia management.

### **Strengths and weaknesses of the study**

Strengths and limitations are evident. The Delphi method is recognised as limited for a few reasons. Firstly, experts from various fields are often likely to know each other; therefore responses could have been influenced by others' opinions. Secondly, levels of expertise were not robustly determined before participants were recruited. Verifying eligibility for inclusion might have strengthened the validity of the pathway. Lastly, it only uses a limited number of consultees therefore may not be wholly representative of the full range of stakeholders, particularly across different prison types. Including prisoners from lower and higher secure prisons, older prisoners (age 65+) and men could have altered the pathway to suit their needs.

### **Implications for clinicians and policymakers**

The pathway follows, and adapts for prisons, NICE guidance and best evidence. For the pathway to be successful there needs to be a substantial culture change across the prison estate in terms of modernising current practices to make them much more evidence based. For instance, if the pathway were implemented, prescribing of hypnotic medication would reduce significantly, to be mainly replaced by self-management and peer involvement. This



**Figure 2:** Final pathway.

may present barriers to its implementation and create conflicts at higher and lower levels of management between different types of staff and between staff and prisoners because they are accustomed to locally derived pro-forma insomnia management. For example, the differing views on medication and the two-tier (peer led and staff led) treatment options may make collaboration between staff and prisoners difficult. However, the fact that stakeholders

like the pathway and signed off on its completion suggests the transition would also be welcomed by other staff.

To be successfully launched in prison, strategic involvement of management and endorsement by frontline staff and practitioners is needed, along with training for all staff and service users and the development of peer roles and self-management. Pathway implementation will require the production of a training package, educating and training both service users and staff. The pathway should be piloted to ensure its effectiveness, which will require time, stakeholder investment and resources. Ultimately, the prisons also need to consider wider determinates of good sleep, including minimising environmental noise, encouraging more purposeful activity and developing prisoner routines to improve prisoners' sleep.

### **Unanswered questions and future research**

We have produced a gold standard treatment pathway for insomnia in prison. In practice, the pathway is likely to require adaptation to suit each type of prison based on of resources, pro forma and team collaboration. However, it is expected that the principal direction and content of the pathway will remain the same.

A feasibility trial should be conducted on the full treatment pathway in a sample of prisons to ascertain its feasibility, acceptability and practicality of implementing into practice. The feasibility study will use a mixed methods approach with a two-arm feasibility randomised controlled trial (RCT) comparing the pathway with usual care. It will comprise of five stages:

- Develop the pathway in collaboration with prison officers, healthcare staff and prisoners
- Incorporation of the pathway into existing practice and staff training.
- Test the feasibility of implementing the pathway – feasibility RCT trial
- Establish the acceptability of the pathway to staff and prisoners
- Test trial processes, including randomisation, recruitment and retention rates and outcome measurement

Individual and prison level outcomes with the pathway's introduction, cost effectiveness of introducing it and ultimate impact on reoffending and wider health and social impacts such as mood, productiveness, staff-prisoner and prisoner-prisoner relationships, demeanour, behaviour and quality of life should also be examined.

### **Conclusion**

The treatment pathway helps to identify, assess and manage insomnia in a population with a large number of sleep complaints. It is an essential next step in addressing the significant burden of insomnia on the prison healthcare system and wider prison community and to

specifically help guide practitioners to make better decisions for prisoner's sleep and health needs. This pathway whilst simple and cheap to deliver could have lasting individual, environmental and societal impact in prisons.

This thesis centred on four studies which individually examined the prevalence of insomnia and its management in prison comprising: current treatment practice, prevalence and aetiology, staff and service user experience of treatment and the design of a treatment pathway, drawing on the previous three study findings. This final chapter highlights: key findings from each study, strengths and limitations, how this work fits in with existing literature, implications for policy and practice and future research.

### 8.1 Summary of main findings

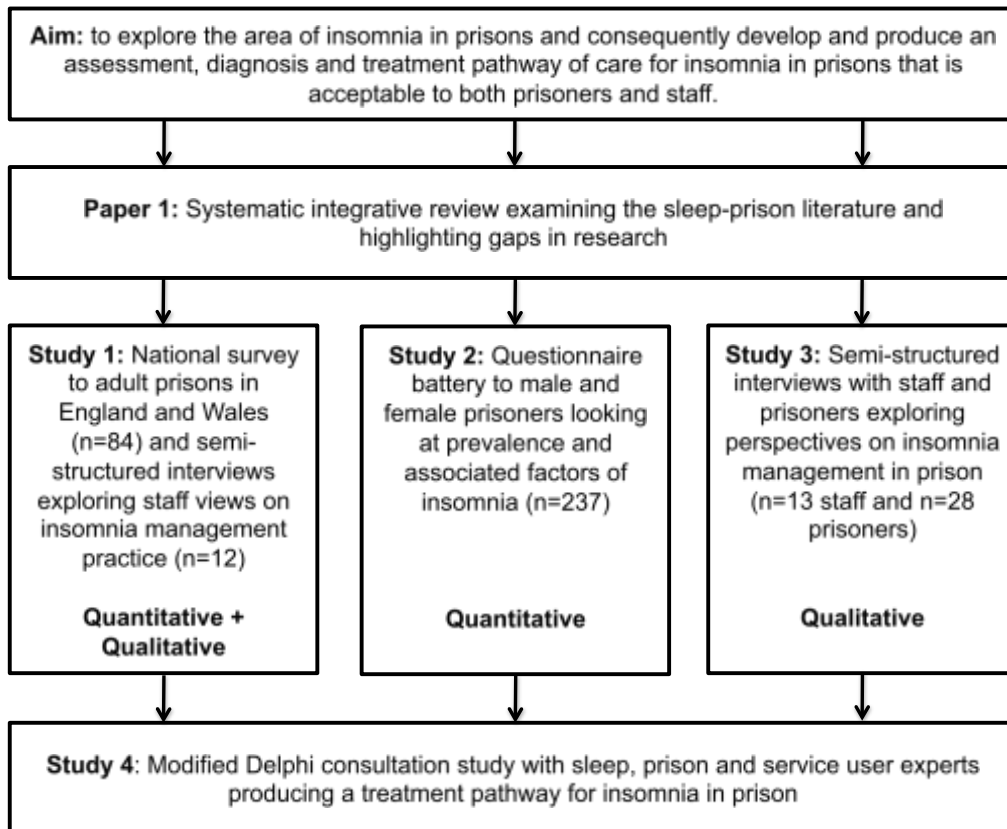


Figure 4: Integration of studies in thesis

#### 8.1.1 Study 1

A national survey was undertaken to identify how insomnia was detected, assessed and treated in adult prisons in England and Wales. Eighty-four prisons (73%) completed the survey. Sleep hygiene education (94%) and hypnotic medication (88%) were the most commonly offered interventions and only one prison used a standardised measure to assess insomnia symptoms.

Twelve members of prison staff completed telephone interviews. Thematic analysis revealed that staff considered insomnia to be a normal part of prison life, often secondary to a range of

mental and physical health issues. Several issues were thought to impact negatively on insomnia management including the prison regime; difficulty in the detection of insomnia; prisoners' beliefs about, and motivations to obtain, medication; and a lack of adherence to NICE guidelines on sleep management. Education and training for staff in sleep promotion was limited but thought to be necessary. Staff concluded that prison-based care for insomnia was not equivalent to that in the community.

#### 8.1.2 Study 2

This cross-sectional study investigated prevalence and associated factors of insomnia in prisoners across two male and one female prisons for adults in Northern England. A sample size of 237 participants was achieved. Nearly two-thirds (61.6%) had possible insomnia disorder and 88.2% had poor sleep quality. I rejected the null hypothesis (page 89), as women were significantly more likely to have possible insomnia disorder than men (70.6% vs 52.5% respectively). Logistic regression analysis found previous help for insomnia, depression, suicidality, physical ill-health, poor sleep hygiene, maladaptive beliefs about sleep and the prison environment were factors significantly associated with having insomnia in prison. The null hypothesis was subsequently rejected. However, perhaps surprisingly, substance misuse did not have a significant association with insomnia in prison.

#### 8.1.3 Study 3

The third study aimed to explore the perspectives of staff and prisoners on insomnia management in prison; specifically seeking how it could be improved. Three main themes were found: value of sleep in prison, barriers and considerations to good sleep and future directions of insomnia management. Both staff and prisoners viewed good sleep as being important for mental and physical health, rehabilitation and to help formulate a routine. In general, prisoners found value in non-pharmacological alternatives rather than medication, but only some staff understood this. For future development of insomnia management, both emphasised self-management as important however some staff felt prisoners did not want to take responsibility for their sleep health. In contrast, prisoners particularly supported peer support with specific focus of giving help to prisoners early in custody.

#### 8.1.4 Study 4

**Study 1** highlighted standardised care for insomnia across the prison estate is currently lacking, thus Study 4 sought to develop a comprehensive, evidence-based treatment pathway, acceptable from both staff and prisoner perspectives. A Delphi technique was employed with prison-insomnia experts to achieve consensus on a final pathway. The finalised pathway offers suggested interventions and care across a person's time in prison including 1) transition from community, induction and first period in prison; 2) detection and assessment; 3) treatment for short-term insomnia; 4) treatment for long-term insomnia; and 5) transition management to the community or transfer to another establishment. In line with

NICE guidance, the pathway emphasises self-management and psychological therapies rather than medication. Special consideration for prescribing hypnotic medication was given to those whose sleep was adversely affected by crises, such as experiencing bereavement or an unexpected lengthy prison sentence.

Each study has been discussed in detail. The next section examines the thesis collectively.

## **8.2 Strengths and limitations**

This section considers the overarching strengths and weaknesses of the thesis; specific strengths and limitations were included within each paper's discussion sections.

### *Strengths*

The main strength of this thesis include using a mixed methods holistic approach to produce an output that can be used in prisons and enhance further knowledge of the field. Utilising both quantitative and qualitative methods enhanced the richness of the data, which allowed me to ascertain the pattern and scale of insomnia as a problem in prison. This would not have been possible using quantitative or qualitative methods alone. Furthermore, the integration of findings of **studies 1, 2 and 3** helped inform **study 4**, the design of the pathway tool.

Both staff and prisoners contributed to the final treatment pathway design so the end result was likely to be acceptable to both groups, unlike the current treatment model. Additionally, prisoner-participants were purposively selected from the sample that had completed the battery of questionnaires, notably those who had insomnia and had asked for help.

The Department of Health suggests researchers should attempt to acknowledge multicultural society viewpoints (Department of Health, 2005). In **study 2**, a random sample of men and women with a wide age range (18-72 years), across three prisons and on different types of wings were included. The sample was largely proportionate to the population from which it was drawn although there was a higher proportion of Black or Black British included compared to the prison population (5% vs. 12% respectively). Minority ethnic groups are more likely to experience sleep problems due to their increased likelihood of health problems than those with white ethnicity (Szczepura, 2005). Likewise, older people and women are also more likely to experience insomnia (Ancoli-Israel & Roth, 1999). Therefore, the sample included those at risk of experiencing insomnia and who would benefit from treatment.

### *Limitations*

Limitations were also evident across each study. **Study 1** did not provide full coverage of prisons in the national survey. Potentially, this resulted in bias towards male, local and low secure prisons. Insomnia management could have been different in female prisons because women are more likely to have complex problems requiring a different approach to men



(Rickford, 2003) and different in higher secure prisons because of increased security measures, such as higher levels of lighting at night. There are potentially more problematic management issues in higher secure environments so these may have been underestimated. Furthermore, prisons that did not complete a questionnaire could have had poor insomnia management and this was therefore not reflected in the results. Consequently, the findings may not give an accurate impression of the national prison insomnia management.

**Study 1** also demonstrated inconsistency between survey and interview results. While sleep was seen as important to most prisons from the survey results (score >5) it was not considered a priority in qualitative interviews. The reason for the lack of consensus is unknown but is potentially due to the different methodologies, better control of material in the survey and seemingly more expressive responses within the semi-structured interview (Harris & Brown, 2010).

In **study 2**, generalisability may be limited due to sampling issues. For instance, on approach some prisoners were excluded or missed, such as prisoners without capacity to consent due to severe mental and physical health problems. Those who considered themselves good sleepers may have thought the research not relevant to them, despite attempting to make it clear that both poor and good sleepers were needed. Additionally, only three prisons were included (one female prison, category B local and category C training); therefore, results may not be generalisable to the entire England and Wales prison estate. Overall, **study 2** results may be biased towards adults with poorer sleep from lower secure prisons and should be interpreted with caution.

Some questionnaires in **study 2** were non-validated and therefore assessment of psychometric properties was not completed before use. However, measures that covered the necessary factors did not exist at study conception, notably environmental factors associated with prison. There was justification to design and use the PESQ in this context, but future assessment with larger samples and psychometric scale development to evaluate validity, reliability and sensitivity is necessary. Furthermore, objective data was not collected regarding environmental elements such as light exposure or noise levels; these were covered subjectivity in the PESQ.

Some data was obtained retrospectively. Retrospective designs have problems with poor memory in participants, which contributes to reduced accuracy (Hassan, 2005). For instance, almost a fifth (15.6% and 17.3% respectively) of the sample in **study 2** had clinical level of anxiety or depression on the BPRS therefore participants may have had particularly low mood or undergoing anxiety in **study 3**. Some prisoners had trouble remembering their sleep

quality when they first came into prison (**study 3**). Furthermore, people with low mood and anxiety may be prone to poor recall (Barlow, 2002). This may have affected the results.

Reporting bias is a danger throughout **studies 1-3**. The thesis relied heavily on questionnaire and interview data and therefore, relied on participant knowledge, experience and subjectivity. Furthermore, social desirability bias whereby participants tend to answer in ways which conform to socially acceptable viewpoints, was likely (Johnson & Fendrich, 1992; King & Bruner, 2000). For example, in **study 1**, when staff were asked about the effectiveness of their current method of managing insomnia, some may not have wanted to highlight inadequacies in the service they were delivering. In **study 3**, in general conversation some staff expressed their disappointment, frustration and annoyance at their own colleagues' prescribing decisions, which contributed to the high hypnotic prescribing rates. However, when taking part in audio-recorded interviews, they appeared to temper their expression of such views. Another potential issue may be that, by reporting insomnia to the researcher, prisoners may have felt their likelihood of receiving medication may be increased, even though it was made clear on a regular basis that I was not involved in, or able to directly influence, their care.

### **8.3 Implications for future service provision**

The clinical implications of my thesis are now discussed in relation to other literature, specifically highlighting potential policy changes and implications for staff and prisoners.

**Study 2** revealed nearly all prisoners had poor sleep quality, with two-thirds having insomnia to a diagnostic level. Insomnia is clearly a big problem for prisoners, and a public health concern (Dement & Pelayo, 1997). However, it is not yet included in UK government public health strategy (Public Health England & World Health Organization, 2015) although sleep health is part of the latest Healthy People national strategy in the US (HealthyPeople, n.d.), which specifically looks to improve adult's sleep sufficiency to seven or more hours at night.

Ideally, imprisonment should offer an opportunity to engage an unhealthy and hard to reach population with NHS services. Offering assistance with sleep in prison could further provide an opportunity to engage an often disadvantaged and chaotic group around broader mental and physical health issues in a way that might not happen in the community. Evidence suggests improving sleep in non-incarcerated populations can improve symptoms of physical health including pain, fatigue and quality of life (Kyle et al., 2010; Tang et al., 2015) and mental health, such as depression, anxiety and suicidal ideation (Benca & Peterson, 2008; Krahn, Miller & Bergstrom, 2008; Pilcher & Ott, 1998). Furthermore, the introduction of the treatment pathway (**study 4**) will potentially have immediate benefit to prisoners by providing an opportunity to have their sleep needs met, and to engage with NHS services that can continue through to community based care upon discharge.

Improving sleep health could also potentially improve behaviour and reduce aggression, self-harm and incidents of suicide. In 2015, there were 2,197 serious incidents of violence in UK prisons (625 assaults against staff); this has more than doubled since 2012, making violence reduction a continual government priority (Prison Reform Trust, 2016). *Chapter 2* showed the potential relationship between poor sleep and aggression, particularly in prison populations (page 88) (Barker et al., 2016; Ireland & Culpin, 2006; Kamphuis et al., 2014, 2012; Vogler, Brand, Grob, & Lemola, 2014). Whilst evidence is mixed, there are early signs that improving sleep could reduce the aggression and subsequent violence in prisons (Kamphuis et al., 2012). Potentially, focusing on sleep within the context of existing aggression and violence reduction programmes could be worthwhile.

Similarly, there is increasing evidence showing a relationship between insomnia and suicidality (Bernert & Joiner, 2007; Bernert, Turvey, Conwell & Joiner, 2014), and within a prison population (Carli et al., 2011). Prisoners may have poor sleep and suicidal ideation because of underlying depression. However, there is strong evidence that insomnia is a risk of suicide, independent of depression (Pigeon, Piquart & Conner, 2012). Similarly, in a sample of 1420 prisoners, Carli and colleagues found when controlling for depression, insomnia still significantly predicted suicidality. Treating insomnia and depression independently may help in the reduction of the peak self-harm risk early in custody. Notably, early custody (first week) is a high risk period for suicide (Humber, Piper, Appleby & Shaw, 2011; Shaw, Baker, Hunt, Moloney, & Appleby, 2004); indeed, anecdotally, the same early risk could be true of insomnia. Therefore, it seems important to assess sleep problems more thoroughly during early custody and monitor new prisoners' sleep throughout the initial period of their time in prison. Emphasis on care for sleep problems during the initial period in prison was highlighted within the treatment pathway (**study 4**). Reducing self-inflicted death is a key part of UK prison policy (Harris, 2015); therefore, targeting sleep problems may be a useful contributory feature to suicide prevention strategy in prison.

Non-pharmacological interventions have an important place within insomnia treatment, particularly in prison populations because of the security issues surrounding medication. **Studies 1, 3 and 4** all discuss the need for non-pharmacological alternatives and **study 4** notably incorporates them in the treatment pathway for insomnia. As shown in *Chapter 2*, CBTi is now recommended as the first line of treatment for insomnia disorder (Qaseem et al., 2016). The treatment pathway directs treatment to CBTi after prisoners have been screened for insomnia. This move should lessen primary care time typically dedicated to sleep complaints and requests for sleep medication. Indeed, Elger found that 44.3% of 995 prisoners seen in 2772 consultations over a year were consulting to discuss sleep complaints (Elger, 2004b). Given that, at present, some prisoners prefer to take medication, the introduction of peer led psychosocial and psychological interventions (e.g. CBTi) may take

time to be accepted; indeed, it may be equally difficult for staff to change their own practice because they are used to their own local management practices. However, introducing peer led interventions should cut down the proportion that is required to be escalated to CBTi. Hopefully, the unhelpful cycle of patients inappropriately requesting, and staff refusing, hypnotic medication for sleep problems should diminish. In turn this should positively impact upon quality of prison life for prisoners and staff. Peer support and self-management are key parts of the pathway, which should reduce time spent in routine primary care consultations for “sleep complaints”, giving them more time for other tasks.

Prisoners are accustomed to taking medication to treat their insomnia. However, hypnotic medication was only included in treatment pathway when acute insomnia is diagnosed under discrete circumstances (e.g. bereavement etc.) (NICE, 2015). This is because wider community guidance suggests it should mainly be used for acute short-term insomnia only and is only effective on a short-term basis (NICE, 2015). Prescribing hypnotic medication is a source of contention between staff and prisoners and, indeed, among staff themselves. As such, the staff relationship can be strained, which can affect day-to-day life of both parties. Similarly, treatments previously recommended by *Safer Prescribing in Prison* document (Royal College of General Practitioners & Royal Pharmaceutical Society, 2011), such as promethazine, are not included in the pathway. Evidence of its effectiveness is limited compared to hypnotics. This decision might cause concern by healthcare professionals because they are used to prescribing promethazine as an acceptable alternative to hypnotic medication. Specific thought was given by myself and sleep experts from **study 4's** consultation panel to include evidence-based interventions as much as possible and maintain equivalence of care to community treatment. The emphasis towards evidence-based non-pharmacological treatments in the pathway means medication should be prescribed less frequently for insomnia in prison.

Sleep problems in prison can cause multiple problems to an individual's wellbeing, productivity and rehabilitation; to security and safety of prison due to increased agitation and disturbance and trading hypnotic medications (See *Chapter 2*). Ultimately, if the individual is unable to benefit from rehabilitation because of insomnia it may impact on their well-being back in the community and potentially contribute to future offending.

The pathway was designed to standardise practice and give patients the best care at an equivalent standard to the community. However, undoubtedly there will be practical implications. In 2014, the government cut £149 million from the prison budget, which resulted in significant staff cuts (Travis & Morris, 2016). Although some new promising initiatives have been introduced into a few prisons (e.g. sleep clinic, specifically dedicated to sleep problems), the reality of implementing the pathway is that prisoners will need to be trained in peer support techniques by staff which will require the production of a training package and

the allocation of time and opportunities within the regime to educate, train and support service users.

Similarly, CBTi was integrated in the pathway as a main component based on its effectiveness (Backhaus, Hohagen, Voderholzer & Riemann, 2001; Morin et al., 2006). A recent economic evaluation found the cost-effectiveness of CBTi compared to hypnotic medication was not yet conclusive (Wickwire, Shaya & Scharf, 2016). However, staff will need to be trained in its implementation, which will require cast investment, time and resources. Yet, it is possible that it is worth the initial cost of CBTi with savings from a reduction in hypnotic prescribing and dedicated staff time for sleep complaints, as well as increased productivity and prisoner learning potential. Furthermore, psychologists working in prisons are fully trained in generic CBT methodology and would be well suited to be extend those skills to insomnia (Espie, 2009). Pathway construction was based on existing evidence, best practice and guidance to the greatest degree. However, potentially, the pathway will change dependent on future studies, new interventions and improved guidance.

#### **8.4 Unanswered questions and future research**

Paper 1 highlighted gaps in the literature that needed further investigation (Dewa et al., 2015). This thesis has attempted to fill some of these gaps:

##### *8.4.1 Research gaps that remain*

###### *8.4.1.1 Is the measurement of insomnia accurate?*

Subjective self-report measures and interviews were used to further understand prevalence rates and contributory factors to insomnia in prison. Prevalence identified through self-report methods is appropriate due to the subjectivity of the disorder and is reflective of everyday healthcare utilisation. However, patients tend to overestimate sleep-onset latency (SOL) and underestimate their total sleep time (TST) in contrast to objective assessments (see Harvey & Tang, 2012). Research has shown a poor correlation between subjective and objective measures, specifically in awakening (Åkerstedt, Hume, Minors & Waterhouse, 1994). This is particularly because people who perceive their sleep to be good could have issues with their sleep that may only come to light after objective assessment (Edinger et al., 2000). PSG is the “gold standard” for diagnosing sleep disorders (Marino et al., 2013). However, practical, security and ethical limitations act as barriers to employing it in a prison population. However, actigraphy (i.e. wrist worn devices tracking movement to assess sleep) might be a suitable alternative due to its previously successful use in restrictive settings, ability for a prisoner’s normal routine to be undisturbed and data collection capabilities over a 24-hour period (Martin & Hakim, 2011). It would be beneficial to use both self-report and actigraphy to diagnose insomnia in prisons and to be used in future studies to strengthen findings.

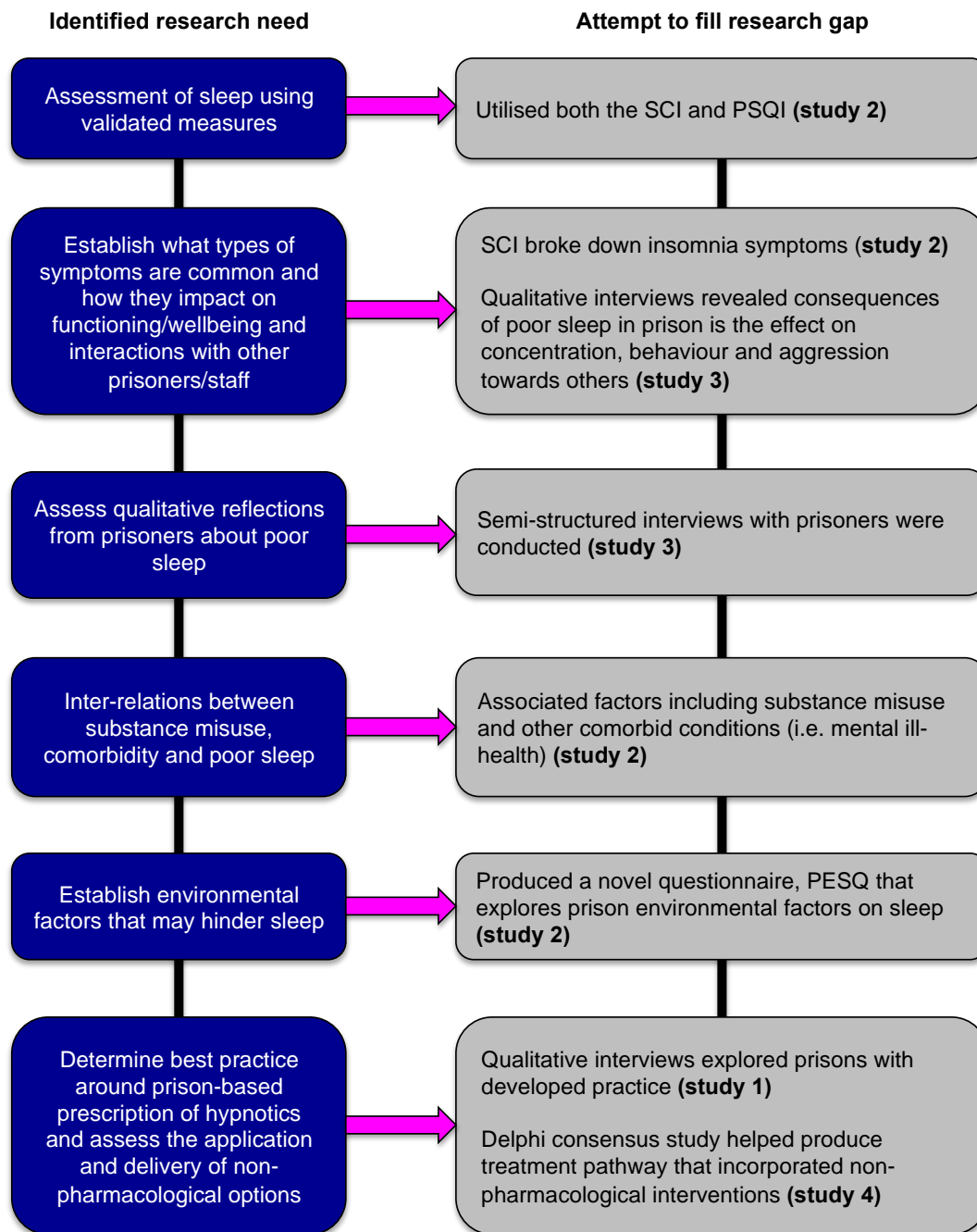


Figure 5: How my research filled some research gaps

#### 8.4.1.2 How does insomnia develop and what are the risk factors in prison?

The natural history of insomnia in prisoners is unknown. Using a longitudinal design examining sleep prospectively, specifically before prison admission through to departure may help to address this gap. This investigation could identify how acute insomnia develops (sleep onset), continues or discontinues and the transition to chronic insomnia (Ellis, Perlis, et al., 2012). Knowing more about the natural history of insomnia may help clarify cause and effect and what factors predict onset or maintenance of insomnia in prison.

Similarly, it would be helpful to know the natural history of insomnia in specific populations, such as those who have co-morbid insomnia and a history of substance misuse. We do not know the effectiveness of prescription medication on prisoners with insomnia or which new psychoactive compounds predict insomnia. A thorough investigation into the relationship with specific drugs, such as new psychoactive substances (i.e. spice) and insomnia in a prisoner sample would therefore be welcomed. Likewise, further research looking at the specific mental health conditions in prisoners with insomnia would be useful to further explain the complex relationship.

Stressful events are also significantly related to insomnia. Community based studies have found stressful events predict the onset of insomnia which is useful to anticipate treatment options (Healey et al., 1981). However, stress was not comprehensively examined in **study 2**. This was because prisoners were asked about prison-related anxiety (e.g. about being in prison, upcoming court date and not seeing family etc.), which acted as a general overview of stress rather than an examination of specific components of stress. However, as prison is related to numerous and regular stressful events, it is deemed important to study stress as a potential risk factor for insomnia in detail in the future.

Further areas of research might be to examine the effect of light on prisoners' sleep. This was because considerable numbers of prisoners are locked up for up to 23 hours a day, with limited access to natural light. Previous research suggests confinement lessens natural light which is key to maintaining the natural circadian rhythm (Nations, 1990). Therefore, the effect of restrictive regimes on circadian disruption and sleep architecture is important to study in the future. Future research looking at the sleep-wake cycle and sleep typology in prisoners would also add to the sleep-prison literature.

#### *8.4.1.3 What works in prison?*

In the general population, there is good evidence that hypnotics are effective in reducing insomnia symptoms short-term and psychological therapies such as CBTi, relaxation therapy and stimulus control are effective in the long-term (see *Chapter 2* and Morin et al., 2015). However, there is insufficient evidence on the effectiveness of acupuncture, valerian and sleep hygiene (NICE, 2015). No RCT have been conducted to measure the effectiveness of insomnia treatment in prison (Dewa et al., 2015). Only five studies have looked at the effectiveness of interventions for insomnia in prison, with just one examining hypnotic medication (Abrams & Siegel, 1978; Elger, 2003; Lutz, 1990; Sumter et al., 2009; Toler, 1978). In a group of 40 prisoners, Elger (2003) found symptoms of insomnia remained after two months, despite taking hypnotic medication during this time period. In contrast, all other studies showed non-pharmacological interventions (relaxation and meditation) were effective.

Future research is needed to establish the effectiveness of hypnotic medication and non-pharmacological intervention on insomnia symptoms in prison.

I developed a pathway that included both hypnotic medication and non-pharmacological interventions, albeit with an emphasis on self-help and peer support. There is increasing evidence that self-help interventions are effective for improving mental health (Houle, Gascon-Depatie, Blanger-Dumontier & Cardinal, 2013) particularly mild to moderate disorders (Falbe-hansen & Wheatley, 2009; NICE, 2011). Similarly, there is some evidence that peer led interventions for patients with serious combined mental illness and chronic diseases, for example the Health and Recovery Peer Program (HARP), and for patients with depression (e.g. Rethink etc.) are effective (Druss et al., 2010; Pfeiffer, Heisler, Piette, Rogers & Valenstein, 2011). Self-help for prisoners with anxiety and depression have also shown to be effective in reducing symptoms (Mauder et al., 2009). However, evidence of the effectiveness in prison for self-help mental health interventions is still limited and, for insomnia specifically, non-existent. One systematic review showed that prison-based peer-led interventions can improve health and mental wellbeing, have a positive effect on trainer and recipient and be cost-effective (Bagnall et al., 2015).

There are potential problems in implementing peer-led interventions for insomnia in prison. The currently differing views on the value of medication and the two-tier (peer led and staff led) treatment options may make collaboration between staff and prisoners difficult. This has direct implications for the success of the pathway in practice. For example, peer led working needs to be appropriately managed, otherwise staff may feel antagonism from prisoners, who may, in turn, feel more comfortable with their peers (Deville, Sorbello, Eccleston, & Ward, 2005). Peer support and self-management is integral to the pathway. Therefore, promoting collaborative working, clear pathway guidance and good communication between staff, peer workers and patients may ease the transition away from medication to a more psychosocial approach and promote a healthier prison. The treatment pathway created in this work presents an opportunity for integrated care, specifically IAPT services and primary care working together. Indeed, integration and collaborative working could contribute to healthcare services potentially making significant improvement in patient care (National Voices, 2012; Samele, Forrester, Urquia & Hopkin, 2016). Furthermore, whilst the integration of different staff disciplines is vital, the collaboration with prisoners, self-managing their health, and that of peers, is equally important (Mauder et al., 2009).

I produced a comprehensive treatment pathway for insomnia in prison that integrated psychological therapies, peer support and self-help. The next step is to design and develop a self-help package for insomnia. Such a package would likely include: adapted sleep materials (e.g. service user training package, guidance and sleeping in prison handbook) and training



for service users to deliver insomnia screening, in sleep science<sup>21</sup> and basic non-pharmacological interventions. The feasibility of the package should be initially evaluated, followed by a full impact trial. The feasibility study would use a mixed methods approach with a two-arm randomised controlled trial (RCT) comparing the pathway with usual care. It would comprise of five stages:

- Develop the intervention in collaboration with prison officers, healthcare staff and prisoners
- Incorporation of the pathway into existing practice and staff training.
- Test the feasibility of implementing the pathway – feasibility RCT trial
- Establish the acceptability of the pathway to staff and prisoners
- Test trial processes, including randomisation, recruitment and retention rates and outcome measurement

Individual and prison level outcomes, with the pathway's introduction, cost-effectiveness of introducing it and ultimate impact on reoffending and wider health and social impacts would be examined. Subsequently, a further feasibility trial should be conducted on the whole treatment pathway to ascertain its feasibility, acceptability and practicality of implementation *in vivo*.

In summary, this thesis has responded to previously unanswered questions in the sleep-prison literature, but there are still some areas that need further investigation.

These include:

- Assessment of sleep using sleep diaries;
- Use objective measures such as PSG and actigraphy;
- Longitudinal examination to determine sleep quality/disturbance pre, during and post prison stay;
- Knowing how the prison environment impacts sleep and whether this differentially affects those of a particular age, gender, or chronotype (i.e., morning/evening); and,
- Conducting randomised controlled evaluations of insomnia treatment options

In addition, I believe a more thorough investigation around the comorbid relationship with substance misuse and insomnia and potentially specific psychiatric conditions is needed.

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<sup>21</sup> E.g. Key facts about sleep and things related (role of physical activity in sleep regulation, age and sleep etc.)

## **8.5 Contribution to knowledge**

My work contributes to the sleep-prison literature where studies are currently lacking. To date, this is the only mixed methods study to investigate insomnia and its management in prisons worldwide. The over-arching goal is to inform service delivery, producing a gold standard treatment pathway for insomnia in prison designed to positively impact on the staff-prisoner relationship and the levels and appropriateness of available care.

**Paper 1** was the first systematic integrative review in the sleep-prison field.

**Study 1** (paper 2) was the first to survey adult prisons collectively in one country. Only one study has asked about insomnia management in prison but this was done in just one prison, using a different methodology (retrospective medical notes review) and no qualitative follow-up was completed.

**Study 2** (paper 3) was the first to examine prevalence and aetiology of insomnia disorder (DSM-V) in prisons; the only other study to examine insomnia prevalence in adult prisons in UK is nearly 20 years old (Singleton et al., 1998).

**Study 3** (paper 4) used semi-structured interviews with both staff and prisoners to further explore perspectives on insomnia management and how prisoners engage with healthcare services in prison.

**Study 4** (paper 5) produced a treatment pathway for insomnia in prison, the first of its kind, other than informal, locally devised care pathways. It is expected that it will be implemented into practice, making a direct impact on prisoner care.

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## Appendices

### Approvals

#### Appendix A: NHS approval

Part of the research infrastructure for Wales funded by the National Institute for Social Care and Health Research, Welsh Government.  
Yn rhan o seilwaith ymchwil Cymru a ariannir gan y Sefydliad Cenedlaethol ar gyfer Ymchwil Gofal Cymdeithasol ac Iechyd, Llywodraeth Cymru



**Research Ethics Committee for Wales**  
Sixth Floor, Churchill House  
17 Churchill Way  
Cardiff CF10 2TW

Telephone : 029 2037 6829  
Fax : 029 2037 6824  
E-mail : corinne.scott@wales.nhs.uk  
Website : www.nres.nhs.uk

19 September 2013

Miss Lindsay Helen Dewa  
Jean McFarlane Building, 2nd Floor  
Institute of Brain, Behaviour and Mental Health  
Oxford Road,  
Manchester M13 9PL

Dear Miss Dewa

**Study title:** The management of insomnia in a prison population: a pilot intervention  
**REC reference:** 13/WA/0249  
**IRAS project ID:** 119633

Thank you for your letter of 17 September 2013, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Vice-Chair, Dr. Maurice Buchalter.

We plan to publish your research summary wording for the above study on the NRES website, together with your contact details, unless you expressly withhold permission to do so. Publication will be no earlier than three months from the date of this favourable opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to withhold permission to publish, please contact the Co-ordinator Dr. Corinne Scott, corinne.scott@wales.nhs.uk.

#### Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

#### Ethical review of research sites

##### NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

#### Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.



Cynhelir Cydweithrediad Gwyddor Iechyd Academaidd y Sefydliad Cenedlaethol ar gyfer Ymchwil Gofal Cymdeithasol ac Iechyd gan Fwrdd Addysgu Iechyd Powys

The National Institute for Social Care and Health Research Academic Health Science Collaboration is hosted by Powys Teaching Health Board



Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at <http://www.rdforum.nhs.uk>.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations

**It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).**

#### Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

<i>Document</i>	<i>Version</i>	<i>Date</i>
Covering Letter	signed Miss Dewa	18 July 2013
Evidence of insurance or indemnity	Zurich Municipal certificate of insurance - University of Manchester - renewal date 01 June 2014	04 June 2013
Evidence of insurance or indemnity	Marsh - confirmation of insurance - University of Manchester; expires 31 May 2014	30 May 2013
Interview Schedules/Topic Guides	Phase 4 - staff interview topic guide; version 1	11 June 2013
Investigator CV	Lamiece Hassan	14 November 2012
Investigator CV	Lindsay Dewa	20 June 2013
Investigator CV	Professor Jenny Shaw; no version or date	
Investigator CV	Jane Senior	05 June 2013
Investigator CV	Lamiece Hassan	14 November 2012
Letter from Sponsor	signed Lynne MacRae	16 July 2013
Letter from Statistician	re insurance cover; signed Lynne Macrae, University of Manchester	16 July 2013
Other: Phase 1 - Healthcare managers letter	1	11 June 2013
Participant Consent Form: Phase 1 Staff	2	16 September 2013
Participant Consent Form: Phase 2 and 3 Prisoner	2	16 September 2013
Participant Consent Form: Phase 4 Prisoner	2	16 September 2013
Participant Consent Form: Phase 4 Staff	2	16 September 2013
Participant Information Sheet: Phase 1 - staff	1	11 June 2013
Participant Information Sheet: Phase 4 - staff	1	11 June 2011
Participant Information Sheet: Phase 2 and 3 Prisoner	2	16 September 2013
Participant Information Sheet: Phase 4 Prisoner	2	16 September 2013
Protocol	no version or date	
Questionnaire: Phase 1 - Healthcare managers questionnaire	1	11 June 2013
Questionnaire: Phase 2 and 3 - prisoner questionnaire battery	1	11 June 2013

Questionnaire: Phase 2 and 3 - prisoner notes - forensic and clinical history	1	11 June 2013
REC application	signed electronically by Miss Dewa; electronically by Lynne MacRae, sponsor's representative; and electronically by Miss Lamiece Hassan, Professor Jenny Shaw and Dr Jane Senior, academic supervisors	24 July 2013
Response to Request for Further Information	Letter signed Miss Dewa	17 September 2013

**Statement of compliance**

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

**After ethical review**

Reporting requirements

The attached document "After ethical review – guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

Further information is available at National Research Ethics Service website > After Review

<b>13/WA/0249</b>	<b>Please quote this number on all correspondence</b>
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We are pleased to welcome researchers and R & D staff at our NRES committee members' training days – see details at <http://www.hra.nhs.uk/hra-training/>

With the Committee's best wishes for the success of this project.

Yours sincerely

**Dr. Maurice Buchalter, Vice Chair**

*Enclosures:* "After ethical review – guidance for researchers"

*Copy to:* Ms Lynne MacCrae  
Sally-Anne Pearson, NHS Wakefield

Appendix B: NOMS approvals



Miss Lindsay Helen Dewa  
University of Manchester  
Jean McFarlane Building, 2nd Floor  
Institute of Brain, Behaviour and Mental Health  
Oxford Road,  
Manchester  
M13 9PL  
[lindsay.dewa@manchester.ac.uk](mailto:lindsay.dewa@manchester.ac.uk)

**National Offender Management Service**  
*National Research Committee*  
Email: [National.Research@noms.gsi.gov.uk](mailto:National.Research@noms.gsi.gov.uk)

1 November 2013

**FINAL APPROVAL– NOMS RESEARCH**

**Ref:** 2013-208

**Title:** Management of insomnia in a prison population: a pilot intervention

Dear Miss Dewa,

The National Research Committee (NRC) is pleased to provide final approval for your research project. The terms and conditions below will continue to apply to your research project.

Please note that the decision to grant access to prison establishments or probation trusts (and the offenders and practitioners within these establishments/trusts) ultimately lies with the Governing Governor or Contract Manager of the establishment/trust concerned. If establishments/trusts are to be approached as part of the research, a copy of this letter must be attached to the request to prove that the NRC has approved the study in principle. The decision to grant access to existing data lies with the Information Asset Owners (IAOs) for each data source and the researchers should abide by the data sharing conditions stipulated by each IAO.

Please quote your NRC reference number in all future correspondence.

Yours sincerely,  
National Research Committee



MoJ Shared Services  
Phoenix House  
Celtic Springs Business Park  
Newport  
South Wales  
NP10 8FZ

E - hr-recruitment-enquiries@noms.gsi.gov.uk  
T - 0845 010 3508

Clearance Granted Date: 25/01/2013

**NATIONAL SECURITY CLEARANCE**

**Date : 25/01/2013**  
**MOJ Ref: 307567**

NAME	BUSINESS AREA	CLEARANCE LEVEL	VALID UNTIL
Lindsay Dewa	H M P Wakefield NOMS (National Offender Management) NOMs Contractor	CTC	25/01/2018

I am writing to notify you that the above individual has been national security cleared either for a current role or a position they are about fill. This clearance has been necessary as their position places them in a position of trust with access to property, individuals and sensitive information of National Security significance. They should be made aware of the security policies relevant to both their role and the business area in which they work.

Please ensure that MoJ Corporate Security is notified, via [security.branch@justice.gsi.gov.uk](mailto:security.branch@justice.gsi.gov.uk), of a change of circumstance: i.e. marital status, living with a partner, a criminal record and if they leave the Dept/ no longer working on MoJ Contracts. For DV clearance, Corporate Security also needs to be advised of a change of address and co-residents. If there are other changes and where there is doubt whether these are reportable changes, please check with MoJ Corporate Security.

If the individual moves to another job that requires national security clearance outside of MoJ their new employer should contact MoJ Shared Services to check that the clearance is valid.

For posts requiring DV and some requiring SC clearance, an annual security review is required. It is mandatory that if sent review forms, that they are completed on request, failure to return these can result in the clearance being suspended or withdrawn.

This letter is a notification of clearance and MUST NOT be accepted as proof of clearance. MoJ Shared Services will confirm whether clearance is valid upon request.

Yours faithfully

**Sarah Thorne**

HR Services  
MoJ Shared Services  
On behalf of the Departmental Security Officer

**\*NOTE: A copy of this clearance letter has been provided to the applicant**

The original of this email was scanned for viruses by the Government Secure Intranet virus scanning service supplied by Cable&Wireless Worldwide in partnership with MessageLabs. (CCTM Certificate Number 2009/09/0052.) On leaving the GSI this email was certified virus free. Communications via the GSI may be automatically logged, monitored and/or recorded for legal purposes.



Appendix C: R and D approvals

Date: 07 January 2014  
Reference: 001\_06\_01\_14\_0000



**West and South Yorkshire and Bassetlaw  
Commissioning Support Unit**

**Research Manager**  
Paul Carder  
Tel: 01274 237406  
paul.carder@wsybcusu.nhs.uk

**Senior Associate: Research**  
Rebecca Harper  
Tel: 01274 237690  
rebecca.harper@wsybcusu.nhs.uk

Miss Lindsay Dewa  
2<sup>nd</sup> Floor Jean McFarlane Building  
Institute of Brain, Behaviour and Mental Health  
University of Manchester  
Oxford Road  
Manchester  
M13 9PL

Dear Miss Dewa

**Re: NHS Research Governance Assurance**

**Study Title: The management of insomnia in a prison population: a pilot intervention**

**Ref no: 001\_06\_01\_14\_0000**

Thank you for your recent submission to NHS West and South Yorkshire and Bassetlaw Commissioning Support Unit.

Following the successful completion of the Research Management & Governance (RM&G) process, we are pleased to provide assurance that all appropriate NHS research governance checks have been completed for the following NHS Primary Care areas:

Wakefield CCG

**Please note – This letter assures independent contractors in the above areas that the Research Management & Governance (RM&G) process has been completed. Each independent contractor will decide whether to participate following this assurance and will confirm separately.**

**The following conditions of assurance will apply:**

You should be aware that assurance is granted subject to the conditions specified below:

- If required you must obtain an honorary contract and Letter of Access from NHS West and South Yorkshire and Bassetlaw Commissioning Support Unit prior to commencing your study.
- Throughout the course of the study, all research activity should comply with relevant, current governance and regulatory requirements including (but not limited to)



[www.wsybcusu.nhs.uk](http://www.wsybcusu.nhs.uk)

Date: 07 January 2014  
Reference: 001\_06\_01\_14\_0000

- o The Research Governance Framework for Health and Social Care, 2<sup>nd</sup> Ed (2005)
- o The Medicines for Human Use (Clinical Trials) Regulations (2004) and subsequent amendments
- o The Mental Capacity Act (2005)
- o The Ionising Radiation (Medical Exposure) (Amendment) Regulations (2006)
- o The Medical Devices Regulations (2002) (Statutory Instrument 2002/618)
- o The Human Tissue Act (2004)
- o The Data Protection Act (1998)
- Consent for NHS West and South Yorkshire and Bassetlaw Commissioning Support Unit to monitor and audit your project, which is implicit in your acceptance of this assurance.
- Where any amendments, substantial or non substantial are made throughout the course of the study these should be notified to NHS West and South Yorkshire and Bassetlaw Commissioning Support Unit on the relevant form (available from <http://myresearchproject.org>)
- A copy of the final study report should be forwarded to NHS West and South Yorkshire and Bassetlaw Commissioning Support Unit on the relevant form (available from <http://myresearchproject.org>) no later than 3 months following study completion
- Should any serious adverse event(s) occur throughout the course of the study these should be notified to NHS West and South Yorkshire and Bassetlaw Commissioning Support Unit using the contact details set out above

Should you require any clarification regarding any of the points raised above, or have any further queries in relation to this assurance and post assurance study management process then please do not hesitate to contact Rebecca Harper on 01274 237690.

Finally, may we take this opportunity to wish you well with your study and look forward to hearing about your progress in due course.

Yours sincerely



**Erica Warren**  
**Principle Associate for Transformation: Experts and Research Service**  
NHS West and South Yorkshire and Bassetlaw Commissioning Support Unit

The documents reviewed were:

Document	Version	Date
REC Approval Letter – Amendment number 1	13/WA/0249	06 December 2013
Notice of Substantial Amendment (non-CTIMPs)	Amendment 1	05 November 2013
REC Approval Letter	13/WA/0249	19 September 2013
NOMS modifications acceptance email		11 November 2013
NOMS approval letter subject to modifications		01 November 2013
Response to request for further information		17 September 2013
Covering Letter		18 July 2013
Interview schedules/topic guides – Phase 4 – staff interview	1.0	11 June 2013
Phase 1 Healthcare Managers letter	1.0	11 June 2013



[www.wsybcusu.nhs.uk](http://www.wsybcusu.nhs.uk)

Bevan House  
17 Beecham Court  
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WN3 6PR

Tel: 01942 482630  
Fax: 01492 482662  
Web: [www.bridgewater.nhs.uk](http://www.bridgewater.nhs.uk)

07 January 2014

Miss Lindsay Dewa  
Institute of Brain, Behaviour & Mental Health  
2<sup>nd</sup> Floor, Jean McFarlane Building  
University of Manchester  
Oxford Road,  
Manchester  
M13 9PL

**Local Study Ref: BCHC 2013/12**  
**CLRN Ref: 119633**  
**Study Sponsor: University of Manchester**  
**Approval Until: 01/07/2015**

Dear Miss Dewa

**Study Title: Management of Insomnia in a prison population: a pilot study.**

Further to the letter issued on 11<sup>th</sup> December 2013, I write to confirm that you now have R&D approval to identify and undertake interviews with prisoners at HMP Risley who are receiving care from Bridgewater Community Healthcare Trust as detailed in your application form for the above study. Approval for interviewing Bridgewater staff working at HMP Risley still applies. You now have permission to proceed on the basis that you are the Chief Investigator. Approval is granted until 31/05/2015.

Permission for this study has been granted on the understanding that where necessary a favourable opinion from a Research Ethics Committee and authorisation by the Medicines and Healthcare products Research Agency (MHRA) are obtained.

As the Chief Investigator you will take responsibility for the conduct of the research, and are accountable for this to the Trust and the research sponsor.

The study must be conducted in accordance with the Department for Health Research Governance Framework for Health and Social Care, Trust policies and procedures, and all relevant and applicable legislation/regulatory requirements, including International Conference on Harmonisation – Good Clinical Practice guidelines (ICH GCP).

On completion of your study, please provide the Trust with a copy of the final report.

All queries should be directed to the Head of Research & Development via 01942 482898/[rachel.hall@bridgewater.nhs.uk](mailto:rachel.hall@bridgewater.nhs.uk).

Yours sincerely,



**Dr Rachel Hall**  
**Head of Research & Clinical Audit**

For Information Only:  
Electronic copy sent to GMCLRN RM&G Office

24<sup>th</sup> February 2014

Miss Lindsay Helen Dewa  
PhD Student  
University of Manchester  
Jean McFarlane Building, 2nd Floor  
Institute of Brain, Behaviour and Mental Health  
Oxford Road  
Manchester, M13 9PL

Dear Miss Dewa,

**Re: NHS Trust Permission to Proceed**

**Project Reference:** 14/03

**Project Title:** The management of insomnia in a prison population: a pilot intervention

I am pleased to inform you that the above project (including amendment one) has received research governance permission.

Please take the time to read through this letter carefully and contact me if you would like any further information. You will need this letter as proof of your permission.

Trust R&D permission covers all locations within the Trust; however you will only be allowed to recruit from the sites/services you have indicated in section 3 of the SSI application form. If you would like to expand recruitment into other services in the Trust that are not on the original SSI then you must contact the R&D department immediately to discuss this before doing so.

You also must ensure you have liaised with and obtained the agreement of individual service/ward managers before commencing recruitment in that service and you must contact the relevant service/ward managers prior to accessing the service to make an appointment to visit before you can commence your study in the trust.

Please make sure that you take your Trust permission letter with you when accessing Trust premises and please include the Trust reference number on any correspondence/emails so that the services are assured permission has been granted.

**Confidentiality and Information Governance**

All personnel working on this project are bound by a duty of confidentiality. All material accessed in the trust must be treated in accordance with the Data Protection Act (1998) For good practice guidance on information governance contact us.

**Protocol / Substantial Amendments**

You must ensure that the approved protocol is followed at all times. Should you need to amend the protocol, please follow the Research Ethics Committee procedures and inform all NHS organisations participating in your research.

**Monitoring / Participant Recruitment Details**

If your study duration is less than one year, you will be required to complete an end of study feedback report on completion. However if your study duration is more than one year, you will be required to complete a short electronic progress report annually and an end of study report on completion. As part of this requirement, please ensure that you are able to supply an accurate breakdown of research participant numbers for this trust (recruitment target, actual numbers recruited). To reduce bureaucracy, progress reporting is kept to a minimum; however, if you fail to supply the information requested, the trust may withdraw permission.

**Recruitment**

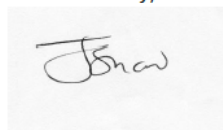
Please provide the trust details of your recruitment numbers when requested. If you have any concerns with recruitment please contact the R&D team immediately for assistance.

**Final Reports**

At the end of your research study, we will request a final summary report so that your findings are made available to local NHS staff. The details from this report may be published on the NHS Trust internet site to ensure findings are disseminated as widely as possible to stakeholders.

On behalf of this Trust, may I wish you every success with your research. Please do not hesitate to contact us for further information or guidance.

Yours sincerely,



*Professor Jenny Shaw*  
**R&D Director**

**On Behalf of the Research Governance Sub-Committee**

Cc: [Laura.Walsh@Lancashirecare.nhs.uk](mailto:Laura.Walsh@Lancashirecare.nhs.uk)  
[researchgovernance@manchester.ac.uk](mailto:researchgovernance@manchester.ac.uk)

## Study specific documentation

### *Integrative review*

#### **Appendix D: Hawker's quality checklist**

##### **Hawker's quality checklist**

###### **1. Abstract and title:** Did they provide a clear description of the study?

Good	Structured abstract with full information and clear title.
Fair	Abstract with most of the information.
Poor	Inadequate abstract.
Very Poor	No abstract.

###### **2. Introduction and aims:** Was there a good background and clear statement of the aims of the research?

Good	Full but concise background to discussion/study containing up-to-date literature review and highlighting gaps in knowledge. Clear statement of aim AND objectives including research questions.
Fair	Some background and literature review. Research questions outlined.
Poor	Some background but no aim/objectives/questions, OR Aims/objectives but inadequate background.
Very Poor	No mention of aims/objectives. No background or literature review.

###### **3. Method and data:** Is the method appropriate and clearly explained?

Good	Method is appropriate and described clearly (e.g., questionnaires included). Clear details of the data collection and recording.
Fair	Method appropriate, description could be better. Data described.
Poor	Questionable whether method is appropriate. Method described inadequately. Little description of data.
Very Poor	No mention of method, AND/OR Method inappropriate, AND/OR No details of data.

###### **4. Sampling:** Was the sampling strategy appropriate to address the aims?

Good	Details (age/gender/race/context) of who was studied and how they were recruited. Why this group was targeted. The sample size was justified for the study. Response rates shown and explained.
Fair	Sample size justified.

Most information given, but some missing.  
 Poor Sampling mentioned but few descriptive details.  
 Very Poor No details of sample.

**5. Data analysis:** Was the description of the data analysis sufficiently rigorous?

Good Clear description of how analysis was done.  
 Qualitative studies: Description of how themes derived/respondent validation or triangulation.  
 Quantitative studies: Reasons for tests selected hypothesis driven/ numbers add up/statistical significance discussed.  
 Fair Qualitative: Descriptive discussion of analysis.  
 Quantitative.  
 Poor Minimal details about analysis.  
 Very Poor No discussion of analysis.

**6. Ethics and bias:** Have ethical issues been addressed, and what has necessary ethical approval gained? Has the relationship between researchers and participants been adequately considered?

Good Ethics: Where necessary issues of confidentiality, sensitivity, and consent were addressed.  
 Bias: Researcher was reflexive and/or aware of own bias.  
 Fair Lip service was paid to above (i.e., these issues were acknowledged).  
 Poor Brief mention of issues.  
 Very Poor No mention of issues.

**7. Results:** Is there a clear statement of the findings?

Good Findings explicit, easy to understand, and in logical progression.  
 Tables, if present, are explained in text.  
 Results relate directly to aims.  
 Sufficient data are presented to support findings.  
 Fair Findings mentioned but more explanation could be given.  
 Data presented relate directly to results.  
 Poor Findings presented haphazardly, not explained, and do not progress logically from results.  
 Very Poor Findings not mentioned or do not relate to aims.

**8. Transferability or generalizability:** Are the findings of this study transferable (generalizable) to a wider population?

Good Context and setting of the study is described sufficiently to allow comparison with other contexts and settings, plus high score in Question 4 (sampling).

Fair	Some context and setting described, but more needed to replicate or compare the study with others, PLUS fair score or higher in Question 4.
Poor	Minimal description of context/setting.
Very Poor	No description of context/setting.

**9. Implications and usefulness:** How important are these findings to policy and practice?

Good	Contributes something new and/or different in terms of understanding/insight or perspective. Suggests ideas for further research. Suggests implications for policy and/or practice.
Fair	Two of the above (state what is missing in comments).
Poor	Only one of the above.
Very Poor	None of the above.

☐



Study 1

Appendix E: Questionnaire

**SECTION 1: PRISONERS WITH SLEEP PROBLEMS**

1.1 What is the name of your establishment?<sup>1</sup>

.....

1.2 On a scale of 1-10, how important is clinical management issue are sleep problems?

1	2	3	4	5	6	7	8	9	10

**SECTION 2: NUMBER OF HEALTHCARE STAFF TRAINED IN THE CARE PRISONERS WITH SLEEP PROBLEMS/INSOMNIA**

2.1 Is any training (internal or external) in the assessment and care of individuals with sleep problems/insomnia offered to staff working within your establishment (if no, please go to question 3.1)?

No = 0      Yes = 1

Please give details

.....  
.....  
.....

2.2 If yes, who developed this training (e.g. in-house or external agency)?  
(Please attach any training guidance/manual)

.....  
.....  
.....

2.3 How many staff members are trained in the assessment and care of prisoners with sleep problems/insomnia in your establishment?

2.4 Do you consider training in the assessment and care of prisoners with sleep problems/insomnia to be sufficient at your establishment?

No = 0      Yes = 1

<sup>1</sup> If you work at more than one establishment, please complete a separate questionnaire for each.

Please give details

.....  
.....  
.....  
.....

**SECTION 3: RECEPTION PROCEDURES FOR PRISONERS WITH SLEEP PROBLEMS/INSOMNIA**

**3.1 Does your establishment currently use a reception screening assessment tool that specifically covers sleep problems/insomnia? (Please attach a copy of the reception screening tool)**

No = 0      Yes = 1

at initial reception

following transfer into the prison from another establishment

**3.2 Does your establishment have any specific first night arrangements for prisoners with sleep problems/insomnia?**

No = 0      Yes = 1

**3.3 Do you have a written protocol regarding the forwarding of reception screening insomnia information to healthcare? (If so, please enclose it with this questionnaire).**

No = 0      Yes = 1

**SECTION 4: DETAILS OF DETECTION AND DIAGNOSIS**

**4.1 Is there an insomnia referral procedure to healthcare? (if no, please go to question 4.3)**

No = 0      Yes = 1

**4.2 If so, please explain the insomnia referral procedure to healthcare?**

.....  
.....  
.....

**4.3 If there is no insomnia referral procedure in place, how is a prisoner with insomnia detected by healthcare?**

.....  
.....  
.....

**4.4 Which healthcare department personnel have responsibility of diagnosing insomnia? Please tick all that apply.**

Staff member	Please tick
Psychiatrist	
Psychologist	
GP	
Mental health nurse	
In-reach staff member	
Prison officer	
Other (please state)	

**4.5 Does the establishment use any tools to diagnose insomnia? (If no, go to question 4.10)**

No = 0      Yes = 1

**4.6 If yes, what tools are used to help diagnose insomnia? (Please attach a copy of any tools you use).**

.....  
 .....  
 .....

**4.7 Do you use any standardised measures in your assessment (e.g. Insomnia Severity Index, Pittsburgh Sleep Quality Index etc.)? (Please attach a copy of any measures you use).**

No = 0      Yes = 1

**4.8 Does your establishment have a set method of managing sleep problems/insomnia?**

No = 0      Yes = 1

**4.9 Is medication used as part of the sleep problems/insomnia management? (If no, go to question 4.14)**

No = 0      Yes = 1

**4.10 If yes, what medications are used?**

Type	Drug	Prescribed (y/n)	Usual dosage (ml)	Average duration (days)
<b>Benzodiazepines</b>				
	Temazepam			
	Loprazolam			
	Lometazepam			
	Diazepam			
<b>Non-benzodiazepines (z-drugs)</b>				
	Zopiclone			
	Zopidem			
	Zaleplon			
<b>Melatonin</b>				
	Melatonin			
	Ramelteon			
<b>Antidepressants</b>				
	Amitriptyline			
	Doxepin			
	Trimipramine			
	Mirtazapine			
	Agomelatine			
	Trazodone			
<b>Anticonvulsants</b>				
	Clonazepam			
	Gabapentin			
	Tiagabine			
<b>Antipsychotics</b>				
	Olanzapine			
	Quetiapine			
<b>Sedative drugs other than antidepressants and hypnotics</b>				
	Antihistamines			
	Choral hydrate			
	Clomethiazole			
	Barbiturates			
<b>Herbal</b>				
	Valerian			
<b>Other</b>				
	Other			

**4.11 Does your establishment offer non-pharmacological intervention for sleep problems/insomnia? (e.g. CBT, sleep hygiene education etc.) (if no, please go to question 4.20)?**

No = 0      Yes = 1

**4.12 If yes, what non-pharmacological interventions are available?**

Treatment	Yes/No	Average duration (days)
Sleep Hygiene Education		
Stimulus Control Therapy		
Relaxation Training		
Sleep Restriction Therapy		
Paradoxical intention		
Biofeedback		
Cognitive Behaviour Therapy (CBT)		
Cognitive Behaviour Therapy for Insomnia (CBTi)		
Other		

**4.13 If yes, how often are the non-pharmacological interventions run at your establishment?**

.....

**4.14 How long have the non-pharmacological interventions been running at your establishment?**

.....

**4.15 Are those staff members that deliver the non-pharmacological intervention(s) trained in the specific intervention?**

No = 0      Yes = 1

**4.16 If yes, what type of staff run the group?**

Staff member	Please tick
Psychiatrist	
Psychologist	
GP	
Mental health nurse	
In-reach staff member	
Prison officer	
Other (please state)	

**4.17 If yes, please specify what training the staff have received and which organisation(s) provided the training?**

.....

**4.18** If your establishment does not offer non-pharmacological interventions, do you think they are needed?

No = 0      Yes = 1

**SECTION 5: ADDITIONAL INFORMATION**

**5.1** Please use this space for comments and/or additional information you feel is not covered in this questionnaire, with specific reference to any difficulties your establishment faces in the care and management of prisoners with insomnia and/or suggestions for improvements.

**5.2** Please use this space to provide any feedback about the questionnaire.

**Many thanks for completing this questionnaire. Please enclose the following information if applicable:**

- written policy regarding sleep and insomnia
- written protocol regarding the forwarding of reception screening information to healthcare
- any diagnostic tools for insomnia

c

**Topic guide for Phase 1 telephone interviews – Why is sleep management so good or bad in your institution?**

**1. Introduction/background (\*DO NOT RECORD THIS BIT\*)**

- Name
- Research project overview and interview format
- Ethics (Consent, confidentiality and withdraw)
- Audio recording
- Any questions before we start

**2. Role Background**

- Ask about job role and what that entails
- In relation to sleep

**3. Current state of insomnia and its management in prison**

- From the questionnaire, you mentioned that insomnia **is/is not** important in your prison (*i.e. indicated by how important you said it was in your clinical management*) (*Explore their answer - why is this? What would make it a higher or lower score?*)
- What does your establishment currently do to manage sleep problems and insomnia? (*Explore medication, non-pharmacological treatments – any sleep clinics? Can you describe anything that you've used in the past? What happened? What worked? Have you tried anything novel or different?*)
- If meds mentioned, ask about whether they have to be taken at the same of dispensing? How many are supervised for sleep meds? Have you considered doing it later or if no, should you do it at all if sleeping from 6-2am is little better than using no meds if the goal is to restore a normal sleep pattern (that you would need in the real world for work etc.) Are other meds other than zop used? Mirtazapine/is this appropriate?
- Are you familiar with NICE guidelines regarding insomnia management? (*Explore their familiarity – can you describe it? If yes, do you use it? How do you use it? What's working for you? What's not working for you?*)

**4. What is working/not working in the management of insomnia**

- How effective do you think the service is? What's working? What's not?
- Why do you think the treatment of insomnia/sleep problems is working/not working in your establishment?
- Do you do anything you consider to be particularly **different/special/innovative**?
- What are the main difficulties your establishment faces in the care and treatment of prisoners with insomnia/sleep problems? How do you think you can overcome these issues?

## **5. Direction and the future**

- What is it about delivering a service in prison which impacts on what you can or cannot do as compared to clinical guidelines in common usage for the wider population? Why is this?
- What else do you think you should be doing to treat sleep problems or insomnia?

**That's all the questions I have to ask you. Is there anything else that you'd like to talk about in relation to the current practice of insomnia management that we haven't already covered?**

**Thanks and debrief**



## Staff Information Sheet

### **Introduction**

My name is Lindsay Dewa, I am a PhD student from the University of Manchester, Institute of Brain, Behaviour and Mental Health. I would like to invite you to take part in a research study about the treatment of insomnia in prison. Before you decide whether to take part, please read the following information carefully and discuss it with others if you wish.

### **What is the purpose of the study?**

The purpose of this study is to successfully implement a pilot intervention for insomnia in two prisons that accurately detects, diagnoses and manages insomnia in prison and harmonises both prisoner and staff attitudes towards treatment. With the results of this study, we hope to be able to plan better care for those adults who experience sleep problems or insomnia. We are also interested in knowing how insomnia is managed in the prison. With the results of this study, we hope to be able to plan better care for those adults who experience sleep problems or insomnia.

A questionnaire has been sent to the healthcare managers of all prisons housing adult males in England and Wales. Interviews will now take place with participating individuals working at a selection of establishments to find out more information.

### **What will I have to do if I take part?**

If you agree to take part in the study, you will be asked to take part in a telephone interview at a time which is convenient to you. Questions will cover what services are available for prisoners with insomnia. This will take approximately 30 minutes of your time.

### **What happens if I don't want to take part?**

Taking part in this study is voluntary. If you would prefer not to take part you do not have to give a reason and no pressure will be put on you to try and change your mind. You can change your mind about taking part at any time.

### **Will my taking part in this study be kept confidential?**

Yes. All the information you give us will be kept confidential within the research team, and used for the purposes of this study only. *The only exception to this would be if you tell us something that raises concerns about your safety, or the safety of others. Should this occur, we would have to inform the appropriate organisations.* All information will be used in a way that will not allow you or your establishment/agency to be identified

individually. We would like to record the interview using a tape recorder, and in this case you will be asked for your permission. The recording will be kept confidential, will not have your name on it and be wiped once transcribed. If you decide that you do not want the interview recorded, you can still take part.

**What happens with my information?**

This will be kept in a locked filing cabinet for no longer than 5 years. Only the research team will have access to these. The research team hope to publish the results in academic journals and provide best practice booklets. This may include anonymous quotes from the interviews, with any identifying information removed.

**Who is organising and funding the research?**

I will be conducting the research with the support of staff employed at the University of Manchester. The project is funded by a Faculty Studentship on behalf of the Medical Research Council. If you would like to make a complaint about the research, please contact a member of the research team, or get a member of staff to contact the research team on your behalf, who will give you the relevant contact details in order to make your complaint.

**What do I do now?**

Think about the information on this sheet. I will be contacting you shortly to answer any questions you may have and ask you if you are interested in participating in the study. After your questions have been answered, if you agree to participate please sign the consent form and return it by email, fax or by post. Please do not hesitate to contact me at any time, if you have any questions regarding any aspect of this process.

If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions. If they are unable to resolve your concern or you wish to make a complaint regarding the study, please contact a University Research Practice and Governance Co-ordinator on 0161 2757583 or 0161 2758093 or by email to [research.complaints@manchester.ac.uk](mailto:research.complaints@manchester.ac.uk)

Lindsay Dewa  
PhD postgraduate student

E: [lindsay.dewa@manchester.ac.uk](mailto:lindsay.dewa@manchester.ac.uk)

Dr Jane Senior  
Research Manager

E: [jane.senior@manchester.ac.uk](mailto:jane.senior@manchester.ac.uk)

**THANK YOU FOR TAKING THE TIME TO READ THIS**

---

Appendix H: Staff consent form

**Consent form**

**Study ID:** \_\_\_\_\_ (completed by researcher)

**Name:** \_\_\_\_\_

PLEASE INITIAL THE BOXES IF YOU AGREE WITH EACH SECTION:

- I confirm that I have read and understood the attached information sheet (phase 1 staff version 2, 20/08/2014) and have had the opportunity to ask questions.
  
- OR** I confirm that I have had the attached information sheet explained to me and have had the opportunity to ask questions.
  
- I understand that relevant sections of data collected during the study maybe looked at by responsible individuals from the University of Manchester, from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in the research. I give permission for these individuals to have access to this data.
  
- I understand that I can withdraw from the study at any time without having to give any reasons.
  
- I agree to the use of anonymous direction quotations from my interview in reporting the results from this study.
  
- I agree to the interview being recorded.
  
- I hereby give consent to be involved in this research project. I understand that there will be no negative impact if I decide not to participate.

_____	_____	_____
Name of Participant	Signature	Date
_____	_____	_____
Name of Researcher	Signature	Date

Study 2

*Appendix I: Prisoner questionnaire battery*

**Demographic Questionnaire**

**Establishment:**

**Study ID:**

**Participant Demographics**

1. Age: \_\_\_\_\_

2. Ethnicity:

- **White**
- British
- Irish
- Any other White background
  
- **Mixed**
- White and Black Caribbean
- White and Black African
- White and Asian
- Any other mixed background
  
- **Asian or Asian British**
- Indian
- Pakistani
- Bangladeshi
- Any other Asian background
  
- **Black or Black British**
- Caribbean
- African
- Any other Black background
  
- **Other Ethnic Groups**
- Chinese
- Any other ethnic group
  
- **Not stated**

3. Marital Status:

- S Single
- M Married/Civil Partner
- D Divorced/Person whose civil partnership has been dissolved
- W Widowed/Surviving Civil Partner
- P Separated
- N Not disclosed

4. What is the main offence you are charged with/convicted of:

- Violence against the person e.g. assault, manslaughter, murder
- Sexual offences
- Robbery offences
- Burglary offences
- Offences against vehicles
- Other theft offences
- Fraud and forgery
- Criminal damage
- Drug offences
- Other miscellaneous offences

5. Prisoner status:

- Remand
- Convicted – un-sentenced
- Convicted – sentenced, if so please specify sentence length: \_\_\_\_\_

6. How long have you been in prison on this sentence/charge?

\_\_\_\_\_

7. How many times have you been in prison before (not including this time)?

\_\_\_\_\_

8. What type of wing are you currently located in?

- Remand/induction
- Convicted
- Vulnerable Prisoner Unit
- Healthcare
- Close supervision centre/other high risk
- Segregation
- Detox
- Drug free

- Elderly
- Other, please specify \_\_\_\_\_

9. What regime are you currently on?

- Basic
- Standard
- Enhanced
- Other, please specify \_\_\_\_\_

10. Cell type

- Single occupancy
- Shared cell

11. Mattress and pillow

- Standard mattress
- One pillow
- Two or more

12. How do you rate your sleep normally?

Excellent	Good	Neither good or bad	Bad	Extremely bad

13. Have you ever sought help for your sleep problems?

- No
- Yes – in the past
- Yes – currently

14. If yes, what treatment did you receive?

- Advice
- Medication
- Psychological intervention
- Nothing
- Other

**The Sleep Condition Indicator (Espie et al., in press)**

Item	Score				
	4	3	2	1	0
<p><b>Thinking about a typical night in the last month ...</b></p> <p>1. ... how long does it take you to fall asleep?</p>	0 – 15 min	16 – 30 min	31 – 45 min	46 – 60 min	≥ 61 min
<p>... if you then wake up during the night ... how long are you awake for in total? (add all the awakenings up)</p>	0 – 15 min	16 – 30 min	31 – 45 min	46 – 60 min	≥ 61 min
<p>... how many nights a week do you have a problem with your sleep?</p>	0 - 1	2	3	4	5 - 7
<p>... how would you rate your sleep quality?</p>	Very good	Good	Average	Poor	Very poor
<p><b>Thinking about the past month, to what extent has poor sleep ...</b></p> <p>... affected your mood, energy, or relationships?</p>	Not at all	A little	Somewhat	Much	Very much
<p>... affected your concentration, productivity, or ability to stay awake</p>	Not at all	A little	Somewhat	Much	Very much
<p>... troubled you in general</p>	Not at all	A little	Somewhat	Much	Very much
<p><b>Finally ...</b></p> <p>8. ... how long have you had a problem with your sleep?</p>	I don't have a problem / < 1 mo	1 – 2 mo	3 – 6 mo	7 – 12 mo	> 1 yr

Scoring instructions: a) Add the item scores to obtain the SCI total (minimum 0, maximum 32)  
b) A higher score means better sleep, c) Scores can be converted to 0 – 10 format (minimum 0, maximum 10) by dividing total by 3.2 d) Item scores in grey area represent threshold criteria for DSM-5 Insomnia Disorder

**Pittsburgh Sleep Quality Index (Buysse et al., 1989)**

**INSTRUCTIONS:**

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, 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 each night?

NUMBER OF MINUTES \_\_\_\_\_

3. During the past month, 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? (This may be different than the number of hours you spent in bed.)

HOURS OF SLEEP PER NIGHT \_\_\_\_\_

For each of the remaining questions, check the one best response. Please answer all questions.

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 once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

b) Wake up in the middle of the night or early morning

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

c) Have to get up to use the bathroom

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

d) Cannot breathe comfortably

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

e) Cough or snore loudly

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

f) Feel too cold

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------



g) Feel too hot

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
---------------------------------	-----------------------------	----------------------------	----------------------------------

h) Had bad dreams

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
---------------------------------	-----------------------------	----------------------------	----------------------------------

i) Have pain

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
---------------------------------	-----------------------------	----------------------------	----------------------------------

j) Other reason(s), please describe \_\_\_\_\_

---

How often during the past month have you had trouble sleeping because of this?

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
---------------------------------	-----------------------------	----------------------------	----------------------------------

6. During 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 or "over the counter")?

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
---------------------------------	-----------------------------	----------------------------	----------------------------------

8. During the past month, how often have you had trouble staying awake while eating meals, or engaging in social activity?

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a 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. Do you have a room mate?

No room mate \_\_\_\_\_  
Room mate in same room \_\_\_\_\_

11. If you have a room mate, ask him/her how often in the past month you have had . . .

a) Loud snoring

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

b) Long pauses between breaths while asleep

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

c) Legs twitching or jerking while you sleep

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

d) Episodes of disorientation or confusion during sleep

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

e) Other restlessness while you sleep; please  
describe\_\_\_\_\_

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

### **Sleep disorders screener (Wilson et al., 2010)**

Suggested algorithm to screen for sleep disorder other than insomnia. Ask the lead question, and then proceed with supplementary only if answer is 'yes'.

#### 1. Narcolepsy

- o **Do you sometimes fall asleep in the daytime completely without warning?**
- o Is it literally impossible to resist 'sleep attacks' during the day?
- o Do you have collapses or extreme muscle weakness triggered by extreme emotion?
- o Do you have visual hallucinations, either just as you fall asleep or when you wake in the morning? e. Are you paralysed and unable to move when you wake up from your sleep?

[Possible narcolepsy: 1a = "TRUE" AND (1b OR 1c OR 1d OR 1e = "TRUE")]

#### 2. Sleep breathing disorder

- a. **Are you a very heavy snorer?**
- b. Does your partner say that you sometimes stop breathing?
- c. Do you often wake up gasping for a breath?
- d. Are you often excessively sleepy during the day or fall asleep without wanting to?

[Possible sleep breathing disorder: 2a = "TRUE" AND (2b OR 2c OR 2d = "TRUE")]

#### 3. PLMS/ RLS

- a. **Do your legs often twitch or jerk or can't keep still in bed?**
- b. Is it very difficult to get to sleep because of repeated muscle jerks?
- c. Do you frequently wake from sleep with sudden jerky movements or with a compulsion to move your legs?
- d. Do you simply have to get out of bed and pace around to get rid of these feelings?

[Possible PLMS/ RLS: 3a = "TRUE" AND (3b OR 3c OR 3d = "TRUE")]

#### 4. Circadian Rhythm Sleep Disorder

- a. **Do you tend to sleep well but just at the "wrong times"?**
- b. Can you sleep well enough, but only if you stay up very late?
- c. Are you in a very sound sleep at normal waking time and could sleep on for hours more?
- d. Can you sleep well enough, but only if you go to bed very early? e. Do you wake very early, bright and alert and no longer sleepy?

[Possible CRSD: 4a = "TRUE" AND EITHER (4b AND 4c 1/4 "TRUE") OR (4d AND 4e = "TRUE")]

#### 5. Parasomnia

- a. **Do you have unusual behaviours associated with your sleep that trouble you or that are dangerous?**
- b. Do you sleepwalk frequently and run the risk of injuring yourself or others?
- c. Do you have frequent night terrors when you are extremely distressed but not properly awake?
- d. Do you act out your dreams and risk injuring yourself or others? e. Do you have terrible recurring nightmares?

[Possible parasomnia: 5a = "TRUE" AND EITHER (5b OR 5c OR 5d OR 5e = "TRUE")]

**Sleep Hygiene Index (Mastin, Bryson and Corwyn, 2006)**

Please circle the letters or blacken the box by using the scale below.

**Always (5)      Frequently (4)      Sometimes (3)      Rarely (2)      Never (1)**

- I take daytime naps lasting two or more hours.
- I go to bed at different times from day to day.
- I get out of bed at different times from day to day.
- I exercise to the point of sweating within 1 h of going to bed.
- I stay in bed longer than I should two or three times a week.
- I use tobacco, or caffeine within 4 h of going to bed or after going to bed.
- I do something that may wake me up before bedtime (for example: play video games, use the internet, or clean).
- I go to bed feeling stressed, angry, upset, or nervous.
- I use my bed for things other than sleeping or sex (for example: watch television, read, eat, or study).
- I sleep on an uncomfortable bed (for example: poor mattress or pillow, too much or not enough blankets).
- I sleep in an uncomfortable bedroom (for example: too bright, too stuffy, too hot, too cold, or too noisy).
- I do important work before bedtime (for example: pay bills, schedule, or study).
- I think, plan, or worry when I am in bed.



8. When I sleep poorly on one night, I know it will disturb my sleep schedule for the whole week.

0 1 2 3 4 5 6 7 8 9 10  
STRONGLY STRONGLY  
DISAGREE AGREE

9. Without an adequate night's sleep, I can hardly function the next day.

0 1 2 3 4 5 6 7 8 9 10  
STRONGLY STRONGLY  
DISAGREE AGREE

10. I can't ever predict whether I'll have a good or poor night's sleep.

0 1 2 3 4 5 6 7 8 9 10  
STRONGLY STRONGLY  
DISAGREE AGREE

11. I have little ability to manage the negative consequences of disturbed sleep.

0 1 2 3 4 5 6 7 8 9 10  
STRONGLY STRONGLY  
DISAGREE AGREE

12. When I feel tired, have no energy, or just seem not to function well during the day, it is generally because I did not sleep well the night before.

0 1 2 3 4 5 6 7 8 9 10  
STRONGLY STRONGLY  
DISAGREE AGREE

13. I believe insomnia is essentially the result of a chemical imbalance.

0 1 2 3 4 5 6 7 8 9 10  
STRONGLY STRONGLY  
DISAGREE AGREE

14. I feel insomnia is ruining my ability to enjoy life and prevents me from doing what I want.

0 1 2 3 4 5 6 7 8 9 10  
STRONGLY STRONGLY  
DISAGREE AGREE

15. Medication is probably the only solution to sleeplessness.

0 1 2 3 4 5 6 7 8 9 10  
STRONGLY STRONGLY  
DISAGREE AGREE

16. I avoid or cancel obligations (social, family) after a poor night's sleep.

0 1 2 3 4 5 6 7 8 9 10  
STRONGLY STRONGLY  
DISAGREE AGREE

**Brief Psychiatric Rating Scale (BPRS) (Overall and Gorham, 1962)**

Rate items 1 through 14 on the basis of patient's self-report during interview. Mark N/A for symptoms not assessed. Note items 7, 12, and 13 are also rated on observed during the interview. **Provide examples.**

	N/A	1 Not present	2 Very Mild	3 Mild	4 Moderate	5 Moderate Severe	6 Severe	7 Extremely Severe
1. Somatic concern								
2. Anxiety								
3. Depression								
4. Suicidality								
5. Guilt								
6. Hostility								
7. Elevated mood								
8. Grandiosity								
9. Suspiciousness								
10. Hallucinations								
11. Unusual thought content								
12. Bizarre behaviour								
13. Self-neglect								
14. Disorientation								

**Rate items 15 through 24 on the basis of patient's observed behaviour or speech during the interview**

15. Conceptual disorganisation								
16. Blunted affect								
17. Emotional withdrawal								
18. Motor retardation								
19. Tension								
20. Uncooperativeness								
21. Excitement								
22. Distractibility								
23. Motor hyperactivity								
24. Mannerisms and posturing								

Notes

**Physical illness related to insomnia questionnaire**

**1. Have you had any problems with any of the following?**

**Yes = 1**

**No = 0**

<b>Condition</b>	<b>Past month</b>	<b>Lifetime</b>
Cardiovascular (e.g. angina, congestive heart failure)		
Respiratory disease (e.g. Chronic Obstructive Pulmonary Disease, asthma etc.)		
Neurological disease (e.g. Alzheimer's or Parkinson's disease)		
Endocrine (e.g. problems with gland, thyroid dysfunction)		
Rheumatological (e.g. immune system, chronic fatigue syndrome, arthritis etc.)		
Gastrointestinal (e.g. irritable bowel syndrome, problems with stomach etc.)		
Genitourinary (e.g. reproductive organs, incontinence etc.)		
Chronic pain		
Any problems with any other medical condition		

---

**2. Have you experienced any physical pain in the last month?**

**Yes = 1**

**No = 0**

**3. If yes, where was the pain?**

---



**Substance misuse questionnaire**

Have you taken any of the following medications that were not prescribed to you?

	Past three months	In lifetime
<b>Opioids</b>		
Heroin		
Methadone		
<b>Stimulants</b>		
Cocaine		
Methamphetamine (Crystal Meth)		
Phenethylamine		
Amphetamine (Speed)		
<b>Phenethylamines</b>		
Ecstasy		
MDMA		
<b>Others</b>		
Cannabis		
Alcohol		
Any others		
<b>Prescription medication</b>		
Benzodiazepines		
Diazepam		
Antipsychotics		
Antidepressants		
Other		

### **Prison environment sleep questionnaire (PESQ) PILOT**

Please indicate to what extent these issues have disturbed you in the past month using the 5-point scale (0= not at all disturbed, 1=somewhat, 2=moderately, 3=quite a bit and 4=extremely disturbed). There is no right or wrong answer. For each statement circle the number according to where your PERSONAL rating falls.

1. In the past month, my sleep was disturbed by noise from the TV and/or radio

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

2. In the past month, my sleep was disturbed by noise from hand washing or toilets flushing

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

3. In the past month, my sleep was disturbed by noise from doors opening, closing or slamming

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

4. In the past month, my sleep was disturbed by noise from loud talking in hallway, conversations between prison staff and/or socialising at the prison staff block office

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

5. In the past month, my sleep was disturbed by noise from intercom or the telephone

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

6. In the past month, my sleep was disturbed by prisoner sounds (e.g. coughing, snoring and/or moaning)

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

7. In the past month, my sleep was disturbed by prisoner incidents (e.g. violence, disorderly behaviour etc.)

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

8. In the past month, my sleep was disturbed, as mine or others' bed parts were squeaking

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

9. In the past month, my sleep was disturbed by any other noise from the prison environment (e.g. keys jangling, air conditioning, heating, footsteps etc.)

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

10. In the past month, my sleep was disturbed, as my mattress was too uncomfortable (e.g. too hard, soft, thin etc.)

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

11. In the past month, my sleep was disturbed by it being too hot

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

12. In the past month, my sleep was disturbed by it being too cold

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

13. In the past month, my sleep was disturbed as it was too light in my cell

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

14. In the past month, my sleep was disturbed as I was in pain

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

15. In the past month, my sleep was disturbed as my mind was racing (e.g. can't switch off)

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

16. In the past month, my sleep was disturbed, as I was worried or anxious (e.g. about being in prison, court date, not seeing my family etc.)

0	1	2	3	4
Not at all	Somewhat	Moderately	Quite a bit	Extremely

What are the top **three** factors that disturb your sleep?

- 1.
- 2.
- 3.

Of the top **three** factors, in the past week how often have they disturbed you?

Never or less than once a week = **0**, once during the week = **1**, twice during the week = **2**, three times or more per week = **3**.

## Participant Information Sheet

### **Introduction**

My name is Lindsay Dewa, I am a PhD student from the University of Manchester, Institute of Brain, Behaviour and Mental Health. I would like to invite you to take part in a research study. It is about the treatment of insomnia in prison. Before you decide whether to take part, please read the following information carefully. You can discuss it with others if you wish.

### **What is the purpose of the study?**

The purpose of this study is to successfully produce a pilot pathway for insomnia in prisons. The pathway will aim to accurately detect, assess and manage insomnia. It will also harmonise both prisoner and staff attitudes towards treatment. With the results of this study, we hope to be able to plan better care for those adults who experience sleep problems or insomnia. We are also interested in knowing how insomnia is managed in the prison. With the results of this study, we hope to be able to plan better care for those adults who have sleep problems or insomnia.

### **Why have I been invited to take part?**

You have been contacted as you completed questionnaires as part of phase 2 or 3 of the study. You have had insomnia recently, have been on sleep medication or are a good sleeper and are 18 years old or older.

### **What will I have to do if I take part?**

If you agree to take part in this part of the study, I will ask you to answer some questions about the way you and the prison staff have managed the insomnia. For example, I will ask you about the types of insomnia treatment you have been offered and taken, whether you think it was effective and anything you would change about the treatment. This will take about 1 hour of your time, but this can be spread over several sessions if you wish. The interview will take place at a time that is OK for you. I may ask to access your medical and prison records to see what has been documented about your care whilst you have been in prison.

### **What happens if I don't want to take part?**

Taking part in this study is voluntary. If you would prefer not to take part you do not have to give a reason. No pressure will be put on you to try and change your mind. You can change your mind about taking part at any time. If you decide not to take part, or

withdraw at any stage, your legal and parole rights and your access to health care will not be affected.

**Will my taking part in this study be kept confidential?**

Yes. All the information you give us will be kept confidential within the research team, and used for the purposes of this study only. The information will be used in a way that will not allow you to be identified individually. *The only exceptions to this is if, after interview, we feel your health or safety, or that of others around you is at immediate risk because of something you have told us about how you are feeling. Another exception is if you have talked about illegal acts including illicit drug use (previous or planned), issues regarding the security of the prison or breaking the rules. In all these cases, we will have to pass that information on to the prison healthcare staff, so that they can help you further.* We would like to record the interview using a tape recorder, and in this case you will be asked for your permission. The recording will be kept confidential, will not have your name on it and be wiped once transcribed. If you decide that you do not want the interview recorded, you can still take part.

**What happens with my information?**

This will be kept in a locked filing cabinet for no longer than 5 years. Only the research team will have access to these. However, it is possible that your data may be looked at by responsible individuals from the University of Manchester and the NHS trust. The research team hope to publish the results in academic journals and provide best practice booklets. This may include nameless quotes from the interviews, with any identifying information removed.

**What are the possible drawbacks to taking part?**

We are interested in hearing about your experience. The study does not involve any treatment or counselling. You may find talking about parts of your experience stressful or upsetting. If this happens, you can choose not to talk about these parts of your experience or stop the interview at any time without giving a reason.

**What are the possible benefits to taking part?**

Your views and opinions will allow us to develop suggestions to improve the way insomnia is detected, diagnosed and managed in prison. This may not benefit you personally, but may help other prisoners with sleep problems or insomnia in the future.

**Who is organising and funding the research?**

I will be conducting the research with the support of staff employed at the University of Manchester. The project is funded by a Faculty Studentship on behalf of the Medical Research Council. If you would like to make a complaint about the research, please contact a member of the research team, or get a member of staff to contact the research team on your behalf, who will give you the contact details in order to make your complaint.

**What do I do now?**

Think about the information on this sheet and ask me about anything that you are not sure about. If you agree to take part, we will go ahead.

**If I need to see someone about the research after I have taken part who can I contact?**

If you have a have a concern, complaint or query about any aspect of this study, you should ask to speak to a member of prison staff who will then contact the research team for you. If the research team are unable to resolve your concerns or you wish to make a complaint regarding the study, please do so via the prison who will then contact the University Research Practice and Governance Co-ordinator.

**If, after taking part in the research, you want further information or have any more questions about the study, tell your personal officer who will then contact me and I will come back to see you.**

**But if after taking part, you become upset and need help instantly to deal with your feelings without hurting yourself, it is very important that you talk to someone straight away.**

**Any member of staff in the prison will be able to help you, all you need to do is speak to someone.**

**Please do this as soon as you start feeling upset, it will help.**

Lindsay Dewa  
PhD postgraduate student

**THANK YOU FOR READING THIS**

Appendix K: Prisoner consent form

**Prisoner Consent Form**

Study ID: \_\_\_\_\_ (completed by researcher)

Name: \_\_\_\_\_

PLEASE INITIAL THE BOXES IF YOU AGREE WITH EACH SECTION:

- I confirm that I have read and understood the attached information sheet (prisoner version 4, 01/11/2013) and have had the opportunity to ask questions.
- OR** I confirm that I have had the attached information sheet explained to me and have had the opportunity to ask questions.
- I agree that for the purpose of this study researchers can access my NOMS and patient clinical records.
- I understand that (my medical notes and) relevant sections of data collected during the study may be looked at by responsible individuals from the University of Manchester, from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in the research. I give permission for these individuals to have access to this data
- I understand that I can withdraw from the study at any time without having to give any reasons.
- I agree to the use of anonymous direct quotations from my interview in reporting the results from this study.
- I agree to the interview being audio recorded.
- I hereby give consent to be involved in this research project. I understand that there will be no negative impact if I decide not to participate.

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name of Researcher

\_\_\_\_\_  
Signature of Researcher

\_\_\_\_\_  
Date

Appendix L: SDS descriptive statistics

Table 9: Descriptive statistics of sleep disorders other than insomnia

	Number [%]
Narcolepsy	7 [3.0]
Period limb movements of sleep/Restless Legs Syndrome (PLMS/RLS)	36 [15.2]
Sleep breathing disorder	20 [8.4]
Circadian rhythm sleep disorder	39 [16.5]
Parasomnia	11 [4.6]
Any sleep disorder (total)	82 [34.6]

Table 10: Sleep disorders by ID status

	ID	No ID	Statistic	P value
Narcolepsy	7 [4.8]	0 [0]	4.496	<0.05
Period limb movements of sleep/Restless Legs Syndrome	32 [21.9]	4 [4.4]	13.360	<0.001
Sleep breathing disorder	18 [12.3]	2 [2.2]	7.447	<0.01
Circadian rhythm sleep disorder	29 [19.9]	10 [11.0]	3.211	0.073
Parasomnia	10 [6.8]	1 [1.1]	4.188	<0.05
SDS	66 [45.2]	16 [17.6]	18.903	<0.001

SDS, other sleep disorder



## Study 3

### Appendix M: Staff interview schedule

04/11/2018 14:02

#### **Interview topic guide: staff**

##### **1. Introduction and greeting (\*DO NOT RECORD THIS BIT\*)**

- Name
- Research project overview and interview format
- Ethics (Consent, confidentiality and withdrawal)
- Audio recording
- Any questions before we start

##### **2. Role background**

- About job role and what that entails
- Your role, prisoners and sleep

##### **3. Detection and diagnosis of insomnia**

- Prisoner insomnia detection
- Assessment of insomnia
- Diagnosis of insomnia (e.g. how do you make a diagnosis of sleep problems?)
- How does sleep impact on the rest of the prison?
- How important do you think good sleep is in prison?

##### **4. Treatment of insomnia (e.g. How do you treat sleep problems here?)**

- What do you think about the insomnia treatment process (e.g. with example, opinion, experiences)
- Comorbid insomnia treatment (e.g. with example)
- Pharmacological vs non-pharmacological treatment (e.g. with example, opinion, experiences). Which do you think prefer? What do you think about non-pharmacological treatment for insomnia?

##### **5. Prescribing**

- Benefits/Effectiveness/Challenges of prescribing insomnia medication
- Assessment and management risks with medication
- Factors that influence insomnia medication prescribing
  - How do you deal with people who prefer medicines? Complaints?
- Inside and outside prison differences on insomnia medication

##### **6. Patient focus**

- Prisoner views on prescribing insomnia medication
- Prisoner choice on insomnia treatment
- How would you describe your relationship with the prisoners? Does it work?

##### **7. Improvements**

- In an ideal world, what do you think insomnia treatment should look like?
- In 5 years time, what improvements do you think there should have been?

**That's all the questions I have to ask you. Is there anything else that you'd like to talk about in relation to the treatment of insomnia in your prison that we haven't already covered?**

**Thanks and debrief.**

**Interview topic guide: prisoners**

**Research question: To explore the attitudes and experiences of prisoners who have had good or poor sleep in prison and what they think would help improve people's sleep**

**1. Introduction/background (\*DO NOT RECORD THIS BIT\*)**

- a. Name
- b. Research project overview and interview format
- c. Ethics (Consent, confidentiality and withdraw)
- d. Audio recording

**Just to let you know that this interview is not like the questionnaire we did last time. Instead the aim is to hear about your views and experiences of sleeping well or not sleeping so well outside and inside prison. So we are just going to have a conversation really!**

Are there any questions before we start?

**2. Personal background (introductory questions – aim to make participant feel at ease)**

- a. Just to start, can you tell me a little bit about yourself?
  - i. How old are you?
  - ii. How long have you been in prison?
  - iii. Is this your first time in prison?
  - iv. What do you do day to day in prison? Have you got a job in prison or are you involved in training/education?

**3. Experience of having trouble sleeping and experience of treatment before prison**

- a. Before you came into prison, did you have any problems sleeping? How would you describe that problem? (*Explore their experience of bad sleep at home – what happened? Why do you feel like you couldn't sleep very well? Why do you think it was a bad sleep? How many hours were you getting? Did you have trouble getting to sleep or were you waking up in the middle of the night? How long ago was this?*)
- b. At the time, did you feel the need to ask for help for this? (*Explore the reasons for asking for help - if so what happened? If not, what were your reasons for this? If so, who did you approach for help? If you got help, what kind of help did you get? e.g. sleep hygiene etc. or access services/Medication/Advice/Nothing?*)
- c. Can you describe what happened to your sleep as a result of that treatment? (Did the sleep improve?)
- d. Overall, how satisfied are you with the treatment that you received? (*Explore how satisfied they've been with the reaction and treatment received to their insomnia – have you been happy with how staff reacted to you having trouble sleeping? If you were satisfied with the treatment you received why is that? What worked well? If not satisfied, what is not working well? Do you consider that the staff dealt with it effectively/appropriately, if so why/why not? If so, how effectively were they dealt with?*) How satisfied were you with the help you received? Would you have preferred medication? Did it work? How did your sleep improve/not improve?
- e. **[if they haven't had trouble sleeping before coming into prison]** If not, have you ever had a problem sleeping? If so, ask the above. If not, move on to Q.4.

**4. Experience of having trouble sleeping in prison**

- a. Have you had trouble sleeping in prison? (*Explore their experience of bad sleep at home – what happened? Why do you feel like you couldn't sleep very well? Why do you think it was a bad sleep? How many hours were you getting? Did you have trouble getting to sleep or were you waking up in the middle of the night? How long ago was this?*)
- b. Think about the last time you had trouble sleeping. What kinds of things have affected your sleep in prison? (*Explore potential reasons for insomnia in prison - Are these problems similar to those you experienced outside of prison, or different? If so, what makes you say that? Are there things that make it more difficult/easier for you to sleep in prisons?*)

#### 5. Expectations of treatment and how the insomnia was treated in prison

- a. Can you tell me what you expected to happen next? (*Explore their expectations: - How did you respond to having trouble sleeping? What did you do about it? What kind of help did you expect to get? Who do you expect to receive help from? How did you decide whether or not to ask for help?*)
- b. At the time, did you feel the need to ask for help for this? (*Explore the reasons for asking for help - if so what happened? If not, what were your reasons for this?*)
- c. Could you talk me through the treatment you were given? (*Explore their experience of treatment for insomnia: - What treatment did you receive? How did they feel about this? How were decisions about your treatment made? Did you ever disagree with any of these decisions? Was it your preferred choice? Did it work/not work? If not, what happened then? Why do you think the treatment improved/did not improve your sleep?*)
- d. Can you describe how your sleep has been recently? (*Explore any recent troubles sleeping: - Has your sleep got better/worse over the last few years? How has this affected your everyday life? Do you have current concerns or issues/needs about your sleep? If so, what are they? Do you know how to resolve it?*)
- e. **[if they didn't ask for help]**  
Can you talk me through why you didn't ask for help? (*Explore reasons why they didn't ask for help - Have you ever thought about asking for help? If not, can you talk me through why you don't want to ask for help? Do you know of what is available? Previous bad experience?*)
- f. **[if they haven't had trouble sleeping in prison]** (*Explore reasons why they consider themselves good sleepers or don't have a problem sleeping – Is it just in prison or when you were outside too? Why do you think you don't have trouble sleeping in prison? What does your routine consist of? Do you exercise? Drink coffee etc.?*)
- g. If one of your peers asked for your advice on how to improve their sleep in prison what would you suggest?

#### 6. Satisfaction and potential issues with current treatment in prison and future improvement

- a. It would be really helpful to hear about your experiences of the help available here. Overall, how satisfied are you with the treatment that you received? (*Explore how satisfied they've been with the reaction and treatment received to their insomnia – have you been happy with how prisoner officer/staff reacted to you having trouble sleeping? If you were satisfied with the treatment you received why is that? What's working well? If not satisfied, what is not working well? Do you consider that the prison officer/staff dealt with it effectively/appropriately, if so why/why not? If so, how effectively were they dealt with?*)
- b. Can you please describe your relationship with the staff that treated you? (*Explore an example of bad/good experience of treatment – would you change anything? If you could tell the staff how you would want things to be improved what would you say?*)
- c. What do you think could be done to help people who are having trouble sleeping in prison? (*Explore different examples of implementing new practice – If there was one thing you could change about the way poor sleep is treated what would you suggest? Would having a "sleep clinic" (a slot specifically dedicated to helping people who are having trouble sleeping) be a good thing to introduce? If so, why? What do you think would be good to include in it?*)
- d. Do you know what's available to you to treat sleep problems? (*Explore what they know about – the rules/practice in place and their opinion about that. If treatments other than medication were available would you try them?*)

- e. Why do you think it's important to help people in prison who are having trouble sleeping?  
*(Explore reasons why they think it would help prisoners – improve mood/concentration etc.)*

**That's all the questions I have to ask you. Is there anything else that you'd like to talk about in relation to the current practice of sleep management here in your prison that we haven't already covered?**

**Thanks and debrief**

## Staff Information Sheet

### **Introduction**

My name is Lindsay Dewa, I am a PhD student from the University of Manchester, Institute of Brain, Behaviour and Mental Health. I would like to invite you to take part in a research study about the treatment of insomnia in prison. Before you decide whether to take part, please read the following information carefully and discuss it with others if you wish.

### **What is the purpose of the study?**

The purpose of this study is to successfully implement a pilot intervention for insomnia in two prisons that accurately detects, diagnoses and manages insomnia in prison and harmonises both prisoner and staff attitudes towards treatment. With the results of this study, we hope to be able to plan better care for those adults who experience sleep problems or insomnia. We are also interested in knowing how insomnia is managed in the prison. With the results of this study, we hope to be able to plan better care for those adults who experience sleep problems or insomnia.

### **What will I have to do if I take part?**

If you agree to take part in the study, you will be asked to take part in a face-to-face interview at a time that is convenient to you. Questions will cover positive and negative attitudes towards sleep and insomnia management, as well as, staff-prisoner relationship with regards to treatment consultation. This will take approximately 1 hour of your time.

### **What happens if I don't want to take part?**

Taking part in this study is voluntary. If you would prefer not to take part you do not have to give a reason and no pressure will be put on you to try and change your mind. You can change your mind about taking part at any time.

### **Will my taking part in this study be kept confidential?**

Yes. All the information you give us will be kept confidential within the research team, and used for the purposes of this study only. *The only exception to this would be if you tell us something that raises concerns about your safety, or the safety of others. Should this occur, we would have to inform the appropriate organisations.* All information will be used in a way that will not allow you or your establishment/agency to be identified individually. We would like to record the interview using a dictaphone, and in this case you will be asked for your permission. The recording will be kept confidential, will not have your name on it and be wiped once transcribed. If you decide that you do not want the interview recorded, you can still take part.

### **What happens with my information?**

This will be kept in a locked filing cabinet for no longer than 5 years. Only the research team will have access to these. The research team hope to publish the results in academic journals and provide best practice booklets. This may include anonymous quotes from the interviews, with any identifying information removed.

### **Who is organising and funding the research?**

I will be conducting the research with the support of staff employed at the University of Manchester. The project is funded by a Faculty Studentship on behalf of the Medical Research Council. If you would like to make a complaint about the research, please contact a member of the research team, or get a member of staff to contact the research team on your behalf, who will give you the relevant contact details in order to make your complaint.

**What do I do now?**

Think about the information on this sheet. I will be contacting you shortly to answer any questions you may have and ask you if you are interested in participating in the study. After your questions have been answered, if you agree to participate please sign the consent form and return it by email, fax or by post. Please do not hesitate to contact me at any time, if you have any questions regarding any aspect of this process.

**If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions. If they are unable to resolve your concern or you wish to make a complaint regarding the study, please contact a University Research Practice and Governance Co-ordinator on 0161 2757583 or 0161 2758093 or by email to [research.complaints@manchester.ac.uk](mailto:research.complaints@manchester.ac.uk)**

Lindsay Dewa  
PhD postgraduate student

E: [lindsay.dewa@manchester.ac.uk](mailto:lindsay.dewa@manchester.ac.uk)

Dr Jane Senior  
Research Manager

E: [jane.senior@manchester.ac.uk](mailto:jane.senior@manchester.ac.uk)

**THANK YOU FOR READING THIS**

## Participant Information Sheet

### **Introduction**

My name is Lindsay Dewa, I am a PhD student from the University of Manchester, Institute of Brain, Behaviour and Mental Health. I would like to invite you to take part in a research study. It is about the treatment of insomnia in prison. Before you decide whether to take part, please read the following information carefully. You can discuss it with others if you wish.

### **What is the purpose of the study?**

The purpose of this study is to successfully produce a pilot pathway for insomnia in prisons. The pathway will aim to accurately detect, assess and manage insomnia. It will also harmonise both prisoner and staff attitudes towards treatment. With the results of this study, we hope to be able to plan better care for those adults who experience sleep problems or insomnia. We are also interested in knowing how insomnia is managed in the prison. With the results of this study, we hope to be able to plan better care for those adults who have sleep problems or insomnia.

### **Why have I been invited to take part?**

You have been contacted as you completed questionnaires as part of phase 2 or 3 of the study. You have had insomnia recently, have been on sleep medication or are a good sleeper and are 18 years old or older.

### **What will I have to do if I take part?**

If you agree to take part in this part of the study, I will ask you to answer some questions about the way you and the prison staff have managed the insomnia. For example, I will ask you about the types of insomnia treatment you have been offered and taken, whether you think it was effective and anything you would change about the treatment. This will take about 1 hour of your time, but this can be spread over several sessions if you wish. The interview will take place at a time that is OK for you. I may ask to access your medical and prison records to see what has been documented about your care whilst you have been in prison.

### **What happens if I don't want to take part?**

Taking part in this study is voluntary. If you would prefer not to take part you do not have to give a reason. No pressure will be put on you to try and change your mind. You can change your mind about taking part at any time. If you decide not to take part, or withdraw at any stage, your legal and parole rights and your access to health care will not be affected.

### **Will my taking part in this study be kept confidential?**

Yes. All the information you give us will be kept confidential within the research team, and used for the purposes of this study only. The information will be used in a way that will not allow you to be identified individually. *The only exceptions to this is if, after interview, we feel your health or safety, or that of others around you is at immediate risk because of something you have told us about how you are feeling. Another exception is if you have talked about illegal acts including illicit drug use (previous or planned), issues regarding the security of the prison or breaking the rules. In all these cases, we will have to pass that information on to the prison healthcare staff, so that they can help*

*you further. We would like to record the interview using a tape recorder, and in this case you will be asked for your permission. The recording will be kept confidential, will not have your name on it and be wiped once transcribed. If you decide that you do not want the interview recorded, you can still take part.*

**What happens with my information?**

This will be kept in a locked filing cabinet for no longer than 5 years. Only the research team will have access to these. However, it is possible that your data may be looked at by responsible individuals from the University of Manchester and the NHS trust. The research team hope to publish the results in academic journals and provide best practice booklets. This may include nameless quotes from the interviews, with any identifying information removed.

**What are the possible drawbacks to taking part?**

We are interested in hearing about your experience. The study does not involve any treatment or counselling. You may find talking about parts of your experience stressful or upsetting. If this happens, you can choose not to talk about these parts of your experience or stop the interview at any time without giving a reason.

**What are the possible benefits to taking part?**

Your views and opinions will allow us to develop suggestions to improve the way insomnia is detected, diagnosed and managed in prison. This may not benefit you personally, but may help other prisoners with sleep problems or insomnia in the future.

**Who is organising and funding the research?**

I will be conducting the research with the support of staff employed at the University of Manchester. The project is funded by a Faculty Studentship on behalf of the Medical Research Council. If you would like to make a complaint about the research, please contact a member of the research team, or get a member of staff to contact the research team on your behalf, who will give you the contact details in order to make your complaint.

**What do I do now?**

Think about the information on this sheet and ask me about anything that you are not sure about. If you agree to take part, we will go ahead.

**If I need to see someone about the research after I have taken part who can I contact?**

If you have a have a concern, complaint or query about any aspect of this study, you should ask to speak to a member of prison staff who will then contact the research team for you. If the research team are unable to resolve your concerns or you wish to make a complaint regarding the study, please do so via the prison who will then contact the University Research Practice and Governance Co-ordinator.



**If, after taking part in the research, you want further information or have any more questions about the study, tell your personal officer who will then contact me and I will come back to see you.**

**But if after taking part, you become upset and need help instantly to deal with your feelings without hurting yourself, it is very important that you talk to someone straight away. Any member of staff in the prison will be able to help you, all you need to do is speak to someone.  
Please do this as soon as you start feeling upset, it will help.**

Lindsay Dewa  
PhD postgraduate student

**THANK YOU FOR READING THIS**

Appendix Q: Staff consent form

**Staff Consent Form**

**Study ID:** \_\_\_\_\_ (completed by researcher)

**Name:** \_\_\_\_\_

PLEASE INITIAL THE BOXES IF YOU AGREE WITH EACH SECTION:

- I confirm that I have read and understood the attached information sheet (phase 4 staff version 3, 27/10/2013) and have had the opportunity to ask questions.
  
- OR** I confirm that I have had the attached information sheet explained to me and have had the opportunity to ask questions.
  
- I understand that relevant sections of data collected during the study maybe looked at by responsible individuals from the University of Manchester, from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in the research. I give permission for these individuals to have access to this data.
  
- I agree to the interview being audio recorded.
  
- I agree to the use of anonymous direct quotations from my interview in reporting the results from this study.
  
- I understand that I can withdraw from the study at any time without having to give any reasons.
  
- I hereby give consent to be involved in this research project. I understand that there will be no negative impact if I decide not to participate.

\_\_\_\_\_  
Name of Participant                      Signature                      Date

\_\_\_\_\_  
Name of Researcher                      Signature                      Date

### Prisoner Consent Form

Study ID: \_\_\_\_\_ (completed by researcher)

Name: \_\_\_\_\_

PLEASE INITIAL THE BOXES IF YOU AGREE WITH EACH SECTION:

- I confirm that I have read and understood the attached information sheet (prisoner version 4, 01/11/2013) and have had the opportunity to ask questions.
- OR** I confirm that I have had the attached information sheet explained to me and have had the opportunity to ask questions.
- I agree that for the purpose of this study researchers can access my NOMS and patient clinical records.
- I understand that (my medical notes and) relevant sections of data collected during the study may be looked at by responsible individuals from the University of Manchester, from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in the research. I give permission for these individuals to have access to this data
- I understand that I can withdraw from the study at any time without having to give any reasons.
- I agree to the use of anonymous direct quotations from my interview in reporting the results from this study.
- I agree to the interview being audio recorded.
- I hereby give consent to be involved in this research project. I understand that there will be no negative impact if I decide not to participate.

\_\_\_\_\_  
Name of Participant                      Signature of Participant                      Date

\_\_\_\_\_  
Name of Researcher                      Signature of Researcher                      Date