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Sleep preoccupation in poor sleepers: Psychometric properties of the sleep Preoccupation Scale

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Abstract

Objectives: Despite daytime factors being implicated as having a key perpetuating role in many of the recent cognitive models of sleep disturbance, standardized, validated measures of sleep-related daytime processing are rare. The aim of the present studies was to develop, refine, and psychometrically evaluate the Sleep Preoccupation Scale (SPS), a self-report tool that examines levels of daytime sleep-related processing. **Methods:** The SPS is constructed using a quantitative content analysis of responses from a survey of older adults (n=116). The scale is then refined using principal components analysis on a general population sample (n=456), and finally, the convergent validity is examined in a general population sample (n=722). **Results:** The results suggest the SPS is a reliable and valid measure of sleep-related daytime processing and discriminates different sleeper groups (poor, average, and good sleepers). **Conclusion:** The findings are related to the models of poor sleep and, in particular, insomnia, and future directions are discussed.

Keywords: Daytime distress; Sleep preoccupation; Psychometric evaluation; Cognitive/behavioral consequences; Affective consequences

Introduction

Although cognitive research has continued to advance our understanding of the complexity surrounding the complaint of poor sleep and, in particular, insomnia [1], there appears to be a bias in the literature toward nighttime cognition. From the initial work on cognitive factors affecting sleep onset latency in the 1970s to present research on thought control and metacognition, there has been significant interest in what and how poor sleepers process information at night, with less emphasis on how they process and interpret information during the day.

The importance of daytime processing has recently been highlighted with several cognitive models outlining the development of a sleep problem suggesting daytime factors impact on the perceived and actual quality, quantity, and timing of future sleep episodes [2–4]. Specifically, when outlining her Cognitive Model of Insomnia, Harvey [3] (p.881) suggests "…daytime processes are assumed to be of equal importance to the processes that operate during the night."

Within the existing literature, there are examples of the types of daytime preoccupations poor sleepers engage in. Moul et al. [5] examined the daytime and nighttime symptoms reported to health care professionals and self-reported by insomniacs. The most frequently reported daytime preoccupations encompassed the perceived physical after-effects and subsequent disruptions to physical and psychological functioning [6]. Moreover, when comparing older insomniacs against older poor sleepers who do not complain of insomnia, one study found that the main

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differentiator was that the insomniacs reported higher levels of daytime fatigue and sleepiness [7]. Yet, despite these findings, research utilising a myriad of techniques, including the Multiple Sleep Latency Test, has failed to conclusively demonstrate actual daytime cognitive impairments or excessive daytime sleepiness amongst poor sleeper groups [8].

Harvey's model [3] provides a rationale for the discrepancy between the reports of daytime deficits and lack of objective verification. She proposes six daytime processes (i.e., excessively negatively toned cognitive activity, autonomic arousal and distress, selective attention and monitoring, distorted perceptions, dysfunctional beliefs, and safety behaviors) interact to fuel an eventual deficit in daytime performance. According to Harvey, a preoccupation with sleep begins at the point of waking and continues throughout the day. More specifically, the poor sleeper begins to appraise their sleep during the hypnopompic state, perceives a sleep deficit, then selectively attends to and monitors for physical sensations of the deficit throughout the day. These evaluations are further compounded by performance anxieties and catastrophic worry and the insomniac employs counterproductive behavioral strategies to counteract the perceived deficit (e.g., drink coffee, nap). Together, these appraisal processes and behaviors confirm the presence of a sleep deficit and create a vicious cycle of negative thinking and worry, leading to actual decrements in functioning.

Support for the daytime aspects of Harvey's model is advancing, with insomniacs demonstrating increased discomfort and anxiety after completing an interview specifically designed to elicit sleep-related catastrophic interpretations, identifying more safety behaviors than good sleepers, and showing attentional biases towards sleep-related cues [9–11]. Moreover, a measure of attentional monitoring for sleep-related threats [(i.e., the Sleep Associated Monitoring Index (SAMI)] has been created and shown to discriminate normal sleepers from poor sleepers [12]. However, where the SAMI measures levels of monitoring over a typical 24-h period, only nine items relate to daytime processing, and these predominately relate to monitoring for physiological symptoms of fatigue and decrements in functioning. Similarly, where it could be suggested that the Dysfunctional Beliefs and Attitudes to Sleep (DBAS) [13] is a measure applicable to daytime cognitions, the DBAS assesses distal as opposed to proximal cognitions, and recent research indicates that a large proportion of items in the DBAS do not discriminate insomniacs from normal sleepers nor relate to cognitive–behavioral therapy (CBT) treatment efficacy [14,15]. As such, there are no standardized measures of the frequency of daytime catastrophically worrying thoughts or feelings, i.e., the excessive negatively toned daytime cognitive activity aspect of Harvey's model.

The aim of the present studies was to develop a self-report measure of sleep-related daytime processing [i.e., the Sleep Preoccupation Scale (SPS)] through a content analysis (Study 1) then examine the psychometric properties of the scale in terms of its factor structure (Study 2) and its convergent validity (Study 3). Specifically, we propose that the SPS would be a reliable and valid index of sleep-related daytime processing, which would discriminate different sleeper groups. Each study was granted a favourable ethical opinion from the University of Surrey Ethics Committee.

Methods

Study 1: Development of the SPS

Participants and procedure

During the recruitment phase for a previous study on poor sleep in older adults [16], participants were asked to complete a questionnaire about their sleep habits; to determine sleeper status (normal sleeper or poor sleeper); and on the final page of the questionnaire, to provide "any further information relevant to *their* sleep pattern" with a particular emphasis on their thoughts, feelings, and behaviors during the day which they felt were a result of their present sleep patterns. Participants were asked to record their responses on the blank space provided on the last page of the questionnaire and, if necessary, attach additional material to the questionnaire and return it using the prepaid envelope provided. Sleep preoccupation was defined as any negative sleep-related thought, feeling (affective or physical), or behavior. Poor sleeper status was defined using 35 questions outlining the inclusion and exclusion criteria for primary insomnia under the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* [17]. In other words, participants had to report a current sleep disruption, occurring at least three nights per week, for longer than 6 months in duration. Additionally, the disruption had to result in distress and disruption to "normal" occupational or psychosocial functioning and not be the result of another sleep disorder, a mental illness, or medical illness affecting the central nervous system or due to substance abuse. Participants were also asked to estimate the duration of their current poor sleep episode.

Of the 247 responses received, 116 (46.96%) were selected on the basis that they explicitly mentioned how their present sleep pattern affected them during the day. Of the 116 texts, 89 (76.72%) came from poor sleepers (6 men, 83 women) and 27 (23.27%) from normal sleepers (2 men, 25 women). The mean age of the sample was 64.04 years (S.D., 5.81), and mean duration of the sleep complaint was 7.06 years (S.D., 7.84).

Epistemology and analytic strategy

Content analysis allows contextual inferences about the systematic meaning of communication [18]. Each individual text was analysed separately. Units of analysis (phrases within a sentence) [e.g., "*(no sleep)* makes me feel weak for