

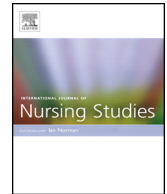


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Review

Sleep assessment of hospitalised patients: A literature review

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ABSTRACT

Background: Sleep is a dynamic and essential part of human life and health. In healthcare settings, nurses are strategically placed to promote sleep and sleep health. In this regard, nursing actions should be based upon effective methods of assessment of patient sleep. Standardised sleep assessment does not currently occur in the care of acute hospitalised patients. Use of an appropriate measurement tool would help evaluate inpatient sleep. An effective, efficient sleep assessment tool is needed to aid clinicians. Such assessment would enable specific nursing intervention to be tailored to individual patients.

Objective: The objective of this paper was to examine the literature on sleep measurement to identify subjective sleep assessment tools that may be suitable for routine use with hospitalised patients, and to evaluate their reliability and validity.

Method: A review of existing literature was undertaken to identify and evaluate subjective sleep measurement tools.

Results: The initial literature searches identified 402 articles, of which ten met the criteria for review. These reported on three subjective sleep measurement scales: the Richards-Campbell Sleep Questionnaire; the St Mary's Hospital Sleep Questionnaire; and the Verran Snyder-Halpern Sleep Scale. The Richards-Campbell Sleep Questionnaire is brief and easy to use. In specific samples, its items correlate with domains reflecting sleep quality and has shown excellent internal consistency. Equivocal results and scoring challenges were found with the St Mary's Hospital Sleep Questionnaire. The Verran Snyder-Halpern Sleep Scale captured sleep disturbance and total sleep time, but time-to-complete is more burdensome than the Richards-Campbell Sleep Questionnaire.

Conclusions: The current use of sleep assessment instruments in the acute hospital setting is restricted mainly to research activities. Of the three tools identified that could be used clinically to measure inpatient sleep, and although it was developed for use in the intensive care setting, the Richards-Campbell Sleep Questionnaire held greatest potential due to its ease and rapidity of use. However, it has yet to be validated for use with general hospital inpatients, and further research is required in this area.

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What is already known about the topic?

- Various subjective and objective sleep measurement instruments have been used in research to assess the

sleep of hospitalised patients. Current routine clinical practice does not include standardised inpatient sleep assessment.

What this paper adds

- This paper evaluates three existing brief and easy-to-use subjective sleep measurement tools that could be used to

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assess inpatient sleep. It describes their psychometric and practical properties and suggests a tool for future testing in an acute hospitalised sample.

1. Introduction

Sleep is a dynamic component of human behaviour that is essential to good health and survival. An exponential expansion in sleep research in recent decades has quashed the theory that sleep is a passive state. It is influenced by light and dark and alternates with wakefulness in a cyclical circadian pattern. Good sleep comprises specific sleep stages which cycle throughout the night, initiated by, and modulating, an intricate cascade of neurochemical activity with resulting systemic benefits (Fuller et al., 2006). A growing evidence base highlights the benefits of good sleep and suggests multi-faceted detrimental physiological and psychological effects of sleep impairment.

Lee's theoretical model suggests disrupted or limited sleep equates to sleep loss, with impaired sleep predisposing to adverse health outcomes (Lee, 2003). Sleep impairment has been shown to increase stress responses thereby delaying healing (Altemus et al., 2001; Gouin and Kiecolt-glaser, 2011). There is also substantive evidence to suggest that acute sleep deprivation produces detrimental sequelae to cardiovascular, metabolic and endocrine systems (Harsch, 2007; Knutson et al., 2007; Somers et al., 2008), possibly mediated by alterations in multiple gene expression dysregulated by sleep truncation (Moller-levet et al., 2013). A shorter length of sleep potentiates alterations in cellular immune function (Cohen et al., 2009; Irwin et al., 1994) and may be a contributing factor to reduced postural control and falls (Patel et al., 2008). Additionally, inadequate or disrupted sleep can lead to a sense of hyperalgesia (Roehrs et al., 2006) and contribute to dysregulation of emotional reactivity (Franzen et al., 2008). Sleep limitation can occur due to reduced quality or quantity of sleep or misalignment of the circadian rhythm. Additionally specific sleep disorders, such as obstructive sleep apnoea, can cause sleep disruption and physiologic derangements and, if undiagnosed, may potentiate complications in acutely hospitalised patients (Gupta et al., 2001; Venn, 2011).

Sleep disruption in the acute hospital setting has been reported widely in the literature (Humphries, 2008; Missildine et al., 2010; Tranmer et al., 2003; Yilmaz et al., 2012). Patients have attributed sleep disruption to environmental factors, symptom management and nursing interventions (Hultman et al., 2012). Around 30% of patients are dissatisfied with their night's rest; which nurses often fail to recognise (Johansson et al., 2005). As the primary care givers to patients in the hospital environment, nurses are strategically placed to assess and promote their patients' sleep. However, it is possible that awareness of the health impacts of good sleep is suboptimal by nursing staff in the acute hospital environment, leading in turn to a lack of emphasis on procedure with regard to patient sleep promotion. One of the barriers to sleep promotion is the lack of a standardised tool to assess sleep (Ye et al., 2013). Routine use of an easy-to-use, brief sleep measurement tool has the potential to help

nurses identify sleep-related issues and communicate this in a concise manner. Clarification of these issues could provide an impetus for improved nursing assessment which should, in turn, lead to implementation of appropriate nursing interventions that promote better sleep for patients. For clinical purposes, there is a need for a validated, brief sleep assessment tool for hospitalised patients.

To date, use of sleep measurement tools in hospital settings has been related to sleep research agendas, focusing on specific issues such as pain (Cronin et al., 2001), ageing (Missildine et al., 2010), and delirium (Jacobson et al., 2008). In sleep research and investigations, laboratory-based polysomnography is acknowledged as the gold standard measurement. It captures multiple sleep variables, including sleep onset, duration, awakenings and architecture. Polysomnography objectively maps sleep stages and cycles by correlation of the various biometrics of modified electro-encephalography, ocular and submental electromyography to track specific muscle activity and monitoring several cardio-respiratory domains (Rodenbeck et al., 2006; Smith and Lee-Chiong, 2008).

However, polysomnography is costly, requiring dedicated space, equipment and the attendance of trained personnel to apply electrodes and wiring, monitor data acquisition and troubleshoot any problems which may arise. It is also burdensome for the patient. These issues render polysomnography unsuitable for daily use in an acute hospital setting. Portable polysomnography instruments are available and used in acute care settings, but again require time expenditure and specific technical expertise to apply the electrodes and leads, and to set up the unit for recording. The presence of head leads can also make it cumbersome for patients, and there is a risk of data compromise due to the loss of leads or electrodes during the course of the night's study.

Other portable monitoring devices have been developed. The bispectral index measurement is used mainly in specialised environments such as anaesthetics and critical care units. Sensors placed on the forehead collect limited but continuous electroencephalographic data that detect cortical arousal and monitor levels of sedation (Dahaba et al., 2011). While not originally designed to monitor normal sleep, the bispectral index has the capacity to measure depth of sleep (Dahaba et al., 2011). In the context of a small clinical trial, Bourne et al. (2007) concluded the bispectral index may be the most useful objective measure of sleep for critical care patients. Actigraphy is another portable modality commonly used in sleep research (Mykityn et al., 1999; Sadeh, 2011). It is similar in size to a wrist watch, is worn the same way and records body movement. The data it captures are downloaded and analysed to map activity and inactivity segments from which wake-sleep periods are then inferred (Chesson et al., 2007). In their review of 25 actigraphy studies, Van de water et al. (2011) determined that actigraphy was the most appropriate objective measure available to inform general sleep patterns in a non-laboratory setting.

Sleep is also measured subjectively. While objective instruments capture and quantify data to present a clear depiction of what occurs physically, subjective tools rely

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