



Psychometric properties of the Turkish version of the Sleep Hygiene Index in clinical and non-clinical samples

Pınar Guzel Ozdemir^{a,*}, Murat Boysan^b, Yavuz Selvi^c, Abdullah Yildirim^a, Ekrem Yilmaz^a

^aDepartment of Psychiatry, Yüzüncü Yıl University School of Medicine, Van, Turkey

^bDepartment of Psychology, Yüzüncü Yıl University School of Arts, Van, Turkey

^cDepartment of Psychiatry, (SUSAB, Neuroscience Research Unit), Selçuk University School of Medicine, Konya, Turkey

Abstract

Objective: Sleep is one of the most significant of human behaviors, occupying roughly one third of human life. Sleep is a process the brain requires for proper functioning. Sleep hygiene can be described as practices to ease sleep and to avoid factors which decrease sleep quality. Inadequate sleep hygiene generally results in disturbance of daily life activities due to inability to sustain sleep quality and daytime wakefulness. Therefore, the importance of development and utilization of measures of sleep hygiene increases. The aim of the study was to assess psychometric properties of the Sleep Hygiene Index (SHI) in clinical and non-clinical Turkish samples.

Method: Data were collected from 106 patients with major depression consecutively admitted to the psychiatry clinic of Yüzüncü Yıl University School of Medicine and 200 were volunteers recruited from community sample who were enrolled at the university. The SHI, Pittsburgh Sleep Quality Index (PSQI), Insomnia Severity Index (ISI) and Epworth Sleepiness Scale (ESS) were administered to the subjects. Factor structure of the SHI was evaluated with explanatory and multi-sample confirmatory factor analyses. Pearson product-moment correlation coefficients of the SHI with the PSQI, ISI and ESS were computed. Item analyses, internal consistency coefficients and intra-class correlations between two repeated applications in both patient and healthy subjects were calculated.

Results: The SHI revealed a unidimensional factor structure. Significant strong partial associations of the SHI with depression, insomnia and poor sleep quality and a modest partial association with sleepiness were detected. Cronbach's alphas for the SHI in community sample and patients with major depression were 0.70 and 0.71, respectively. Additionally, we found acceptable three-week temporal reliability in terms of intra-correlation coefficients of $r = 0.62$, $p < 0.01$ for the community sample and of $r = 0.67$, $p < 0.01$ among patients with major depression.

Conclusion: The SHI revealed adequate validity and reliability to be used by researchers in Turkish sample. Current results were discussed in light of previous findings and theoretical considerations.

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1. Introduction

Sleep is not only a time segment apart from the daily life, but a vital necessity during which the body renews itself for a healthy and long life [1]. Sleep is the temporary, partial and periodic loss of communication between the organism and the environment; it varies in intensity, is reversible with

stimuli and comprises one third of the human life span [1,2]. Restful and good quality sleep is needed for a healthy, happy and good life.

It is a known fact that sleep is the best form of resting. Impaired sleep quality can result in harmful effects on mental and physical well-being [3,4]. Impaired or disrupted sleep has been shown to cause poor concentration, reduced energy levels, altered immune function, poor wound healing, mood changes (increased impatience and irritability), increased risk of depression or anxiety, and a higher occurrence of accidents and falls, especially in the elderly [4,5].

Sleep hygiene (SH) can be described as practices developed, in turn, to facilitate falling asleep and to improve sleep quality [6,7]. Recently, there has been an increased attention in the areas of sleep quality and poor sleep practice.

* Corresponding author at: Department of Psychiatry, Yüzüncü Yıl University School of Medicine, Van, Turkey. Tel.: +90 432 215 0473; fax: +90 432 216 7519.

E-mail addresses: pguzelozdemir@yahoo.com (P.G. Özdemir), boysan.murat@gmail.com (M. Boysan), dryavuzselvi@yahoo.com (Y. Selvi), yldrmabdullah@yahoo.com (A. Yildirim), ekrem.yilmaz.84@hotmail.com (E. Yilmaz).

Behaviors conducive to sleep include regular exercise, regular bed times and arising times, and no daytime napping [8]. Behaviors that disrupt SH include improper sleep schedule, the use of sleep disturbing products in bed, behaviors that promote arousal near bedtime, and failure to maintain a comfortable sleeping environment that impairs sleep quality. Therefore, SH practices regulate quantity and quality of sleep [9]. Poor SH practices are associated with difficulties in initiating or maintaining sleep [8]. Relatively few cross-sectional studies have addressed and pointed to the potential role of poor SH in college students' poor sleep quality that a large index of SH behaviors were significantly worse among college students with poor sleep quality relative to good sleepers [10].

Sleep hygiene disorder is incorporated in extrinsic sleep disorders [11]. Inadequate sleep hygiene may lead to severe disturbances in daily life activities due to inability to sustain sleep quality and daytime wakefulness. Inadequate sleep hygiene was first introduced as a diagnostic category in the International Classification of Sleep Disorders (ICSD) in 1991 with the new definitions appearing in the 2005 edition by the American Academy of Sleep Disorders [11]. The diagnostic criteria for Inadequate Sleep Hygiene in the subsequent version of ISCD are as follows: The patient has a complaint of either insomnia or excessive sleepiness. At least one of the following is present: i) improper sleep schedule as frequent daytime napping, selecting variable bedtimes or rising times, or spending excessive amounts of time in bed; ii) routine use of products containing alcohol, nicotine, or caffeine, especially immediately preceding bedtime; iii) engagement in mentally stimulating, physically activating, or emotionally upsetting activities too close to bedtimes; iv) frequent use of the bed for activities other than sleep (such as television watching, reading, studying, snacking, thinking, planning; v) failure to maintain a comfortable sleeping environment. Additionally, one or more of those presentations including increased sleep latency, reduced sleep efficiency, frequent arousals, early morning awakening, excessive sleepiness on a multiple sleep latency test. Finally, the sleep disturbance is not better explained by another sleep disorder, medical or neurologic disorder, mental disorder, medication use, or substance use disorder. This condition is associated with mood disorders, decreased attention and concentration, daytime sleepiness and fatigue; there is also excessive preoccupation with sleep. It leads to decreased performance in daily life activities [11].

Sleep diaries are commonly used in assessment of psychological disturbances associated with sleep. Various scales have also been developed in order to determine sleep disturbances in clinical research and population screening [12,13]. According to our knowledge, three instruments designed to evaluate sleep hygiene: the Sleep Hygiene Awareness and Practice Scale (SHAPS) [8,12], the Sleep Hygiene Self-Test (SHST) [14], and the Sleep Hygiene Index (SHI) [6]. The first two instruments have been found to have relatively low internal consistency (Cronbach's

alphas = 0.47 for the SHAPS and 0.54 for the SHST), compared to the SHI (Cronbach's alpha = 0.66). The SHI has been shown to have moderate internal consistency and good two-week test-retest reliability ($r = 0.71$, $p < 0.001$), and to be significantly associated with poor sleep quality in a non-clinical sample [6]. The SHI had also good validity in a sample of patients with chronic pain in Korea [15]. On the other hand, there has been a lack of reliable and valid measure of SH to be used in Turkish population. The aim of the current study is to evaluate the psychometric properties of the Sleep Hygiene Index, a 13-item questionnaire derived from diagnostic criteria of "insufficient sleep hygiene", based on the definition in ICSD in Turkish clinical and non-clinical samples.

2. Methods

2.1. Subjects and study protocol

Three hundred and six subjects were included in the study. One hundred and six of the sample were depression patients consecutively admitted to the psychiatry clinic of Yüzüncü Yıl University School of Medicine and 200 were volunteers recruited from community sample who were enrolled at the university. Participants were aged between 16 and 60 and mean age was 25.26 years ($SD \pm 7.17$). Virtually half of the sample were females ($N = 183$, 59.8%). Demographical characteristics are reported in Table 1.

Using Structured Clinical Interview for DSM IV Axis-I disorders, patients were diagnosed as major depressive disorder according to DSM-IV diagnostic criteria. After having been briefly informed about the study, subjects were taken written consent and completed psychological instru-

Table 1
Characteristics of the sample (N = 306).

	N	Percentage %
Major depression	106	34.64
Healthy individuals	200	65.36
Sex		
Female	183	59.80
Male	123	40.20
Marital status		
Married	56	18.30
Single	250	81.70
Education		
Illiterate	7	2.29
Elementary	37	12.09
High school	27	8.82
College or higher	235	76.80
Job status		
Student	216	70.59
Housewife	30	9.80
Official staff	29	9.48
Private sector	22	7.19
Unemployed	9	2.94
Medical health problems	30	9.8
Sleep disorders	17	5.56
History of mental health problems	39	12.75
Family psychopathology	24	7.84

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