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

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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.

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.

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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 ± 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

ments. Control group of the study was chosen among healthy undergraduate students. All depression patients and thirty-two healthy volunteers underwent a twenty-day test–retest procedure. The research procedure received approval from the Ethical Committee of Yüzüncü Yıl University.

2.2. Statistical analysis and procedure

Initially, we computed descriptive statistics. To explore the factor structure of the Turkish version of the SHI, we run varimax rotated principal components analysis and confirmed the factor solution of the explanatory factor analysis (EFA) through multi-sample confirmatory factor analysis (CFA), adhering to the procedure of Satorra-Bentler normalized structural equation modeling. Cronbach's alpha coefficients were separately computed in clinical and non-clinical groups. Twenty days test–retest intra-class correlation coefficients between two repeated applications of the SHI in major depression patients (N = 106) and healthy controls (N = 32) were calculated for test–retest reliability. We computed Pearson product-moment correlation coefficients of the SHI with the Pittsburgh Sleep Quality Index (PSQI), Insomnia Severity Index (ISI) and Epworth Sleepiness Scale (ESS) in order to demonstrate the construct validity of the instrument.

2.3. Instruments

2.3.1. Insomnia Severity Index (ISI)

It is a highly valid and reliable measurement device developed for evaluation of insomnia severity [16]. The index consists of seven questions each of which are scored between 0 and 4 points. Total scores range from 0 to 28 points. Items evaluated are as follows: i) severity of sleep onset, ii) sleep maintenance, iii) early morning awakening problems, iv) sleep dissatisfaction, v) interference of sleep difficulties with daytime functioning, vi) noticeability of sleep problems by others and vii) distress caused by the sleep difficulties. Although the index is a self-reporting measure, clinician or significant others (for example a spouse) can also use it for evaluation. Psychometric properties of the ISI in the Turkish sample were conducted [17].

2.3.2. Pittsburgh Sleep Quality Index (PSQI)

The PSQI is a self-administered questionnaire that assesses sleep quality and disturbances [18]. Cronbach alpha internal consistency quotient was 0.80 [19]. PSQI assesses the sleep quality over a one-month time interval. The questionnaire is composed of 24 items 19 of which is self-rated and 5 questions answered by the subject's spouse or roommate. Self-rated 19 questions include seven dimensions of sleep quality as subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, medication use for sleep, and daytime dysfunction. The PSQI yields a total score ranging from 0 to 21. The higher the global score, the worse the sleep quality. A global PSQI score at >5 is considered to be a sensitive and specific measure of poor sleep quality. The PSQI was demonstrated to have good validity and reliability in Turkish population [20].

2.3.3. Epworth Sleepiness Scale (ESS)

It is a simple and self-administered scale used for evaluation of daytime sleepiness. It consists of 8 questions. The questionnaire provides a measurement of the likelihood that a subject would doze off during a day which he or she is not particularly tired. It aims to evaluate the chances that the subject would fall asleep or doze off during 8 different situations commonly encountered in daily life (sitting and reading, watching television, sitting inactively in a public place, as a passenger in a car, lying down to rest in the afternoon, talking to someone, sitting quietly after a lunch without alcohol and in a car while stopped for a few minutes in traffic). All questions are scored in the same manner; 0 points if the chances of dozing off are none, 1 if slight, 2 if moderate and 3 when the chance of dozing is high. A total score of 10 or greater indicates excessive daytime sleepiness. The Epworth Sleepiness Scale (ESS) has been widely used in sleep and primary care clinics since its development [21,22]. ESS scores that are less than 10 are considered normal, 10–12 borderline, and scores greater than 12 suggest problems with excessive sleepiness. Izci et al. reported good reliability and validity for the ESS in Turkish population [23].

2.3.4. Sleep Hygiene Index (SHI)

The Sleep Hygiene Index (SHI) is a 13-item selfadministered index intended to assess environmental and behavioral variables that could promote inadequate sleep [6]. Participants were asked to indicate how frequently they engage in specific behaviors (always, frequently, sometimes, rarely, never). Items constructing the Sleep Hygiene Index were derived from the diagnostic criteria for inadequate sleep hygiene in the International Classification of Sleep Disorders [10]. It was administered in conjunction with the ESS and the PSQI and had positive correlation with the ESS ($r = 0.244$, $p < 0.01$) and the PSQI total score ($r = 0.481$, $p < 0.05$ or less) [6]. Item scores were summed providing a global assessment of sleep hygiene. The items are totaled yielding a global assessment score for sleep hygiene ranging from 13 to 65. Higher scores are indicative of more maladaptive sleep hygiene practices. Higher scores are indicative of more maladaptive sleep hygiene status.

2.4. Procedure

Two independent translators translated the SHI to Turkish. The translated versions of the scale were compared from the point of targeted translations. Finally, the translated versions were combined after having a consensus on the items.

3. Results

3.1. Descriptives

There were 306 complete observations for psychometric analysis of the Sleep Hygiene Index. The mean SHI score was 30.44 (SD ± 7.37).

3.2. EFA and multi-sample CFA

We performed explanatory and confirmatory factor analyses to explore the construct validity of the Turkish version. We evaluated the item characteristics through computing item statistics. Item means, standard deviations, and item-total correlations are indicated in Table 2. Item discrimination indexes in terms of item-total correlation coefficients, as can be seen in Table 2, were greater than >0.20 with the exception of items 4 and 12. Specifically, item 4 had an extremely low value. We put all these items into principal components analysis. Kaiser–Meyer–Olkin measure of sampling adequacy was 0.70. We computed a Bartlett's chi square value of 622.366 $p < 0.001$ which was indicative of appropriateness of data for the analyses.

To validate the unidimensional structure of the SHI extracted through EFA in Turkish clinical and non-clinical samples, a Satorra–Bentler corrected multi-sample maximum likelihood CFA was conducted with the data. Goodness-of-fit indices for this one-factor structure fell short of statistical significance range: S-B χ^2 (143) = 352.76, $p < .001$, RMSEA = 0.10, TLI = 0.72, CFI = 0.74, IFI = 0.74. We constrained the parameters as equal across two sub-samples yet the model also fell within "unacceptable" range: S-B χ^2 (156) = 367.72, $p < 0.001$, RMSEA = 0.09, TLI = 0.74, CFI = 0.74, IFI = 0.74. Although both models of CFAs were not good, adhering to the procedure suggested by Bryant we found that statistical differentiation of baseline and nested models was not substantial (Scaled χ^2 (13) = 13.89; $p = 0.383$). The model modification indices suggested to add four error covariance between item 2 "I go to bed at different times from day to day" and item 3 "I get out of bed at different times from day to day"; item 6 "I use alcohol, tobacco, or caffeine within 4 h of going to bed or after going to bed" and item 7 "I do something that may wake me up before bedtime"; item 8 "I go to bed feeling stressed, angry, upset, or nervous" and item 13 "I think, plan, or worry when I am in bed"; and item 10 "I sleep on an uncomfortable bed" and item 11 "I sleep in an uncomfortable bedroom". We replicated performing the constrained multi-sample maximum likelihood CFA with additional four error covariance parameters that the goodness-of-fit indices for this CFA were in acceptable range: S-B χ^2 (152) = 232.42, $p < 0.001$, RMSEA = 0.06, TLI = 0.90, CFI = 0.90, IFI = 0.90. Goodness of model-fit indices are presented in Table 3.

Table 2
Factor loadings for explanatory and confirmatory factor analyses.

	Sleep Hygiene Index				
	Mean	SD	Item-total r	φ	λ
Item 1	1.91	1.01	0.24	0.34	0.32
Item 2	3.11	1.23	0.46	0.65	0.67
Item 3	3.00	1.11	0.44	0.64	0.57
Item 4	1.29	0.73	0.06	0.07	0.03
Item 5	2.67	1.26	0.40	0.57	0.69
Item 6	1.78	1.37	0.29	0.44	0.47
Item 7	2.30	1.30	0.43	0.56	0.65
Item 8	2.33	1.21	0.38	0.52	0.42
Item 9	2.55	1.39	0.32	0.45	0.62
Item 10	1.68	1.02	0.27	0.37	0.20
Item 11	1.94	1.27	0.35	0.48	0.40
Item 12	2.45	1.34	0.17	0.26	0.28
Item 13	3.38	1.31	0.40	0.54	0.50

φ = Unrotated item factor loadings of explanatory factor analyses; λ = Standardized factor loadings of exogenous variables derived in confirmatory factor analysis.

Table 3
Model-fit results of multi-sample confirmatory analysis for the Sleep Hygiene Index.

	df	S-B χ^2	RMSEA	TLI	CFI	IFI
One factor parameters free	143	352.76	0.098	0.72	0.74	0.74
One factor constrained	156	367.72	0.094	0.74	0.74	0.74
One factor constrained plus four error covariance parameters	152	232.42	0.059	0.90	0.90	0.90

df = degrees of freedom; S-B χ^2 = Satorra–Bentler Scaled χ^2; RMSEA = Root mean square of approximation; TLI = Tucker-Lewis Index; CFI = Comparative Fit Index; IFI = Incremental Fit Index.

3.3. Validity

The SHI was moderately correlated with scale scores of the Beck Depression Inventory, Insomnia Severity Index, and Pittsburgh Sleep Quality Index Global but we found a modest connection with the Epworth Sleepiness Scale. Pearson product-moment correlation coefficients are reported in Table 4. As can be seen in Fig. 1, partial effects of the variance of latent variable in terms of sleep hygiene were significantly predictive of elevations on the BDI ($\beta = 0.60$, $p < 0.01$), ISI ($\beta = 0.66$, $p < 0.01$), and PSQI Global ($\beta = 0.61$, $p < 0.01$) and ESS ($\beta = 0.23$, $p < 0.01$) scores as well.

3.4. Reliability

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.

Table 4
Pearson product-moment correlation coefficients.

	Overall sample	Community sample	Major depression
Beck Depression Inventory	.35**	.47**	.32**
Insomnia Severity Index	.42**	.47**	.32**
Epworth Sleepiness Scale	.24**	.26**	.22*
Pittsburgh Sleep Quality Index Global	.39**	.46**	.26**

* $p < .05$
** $p < .01$.

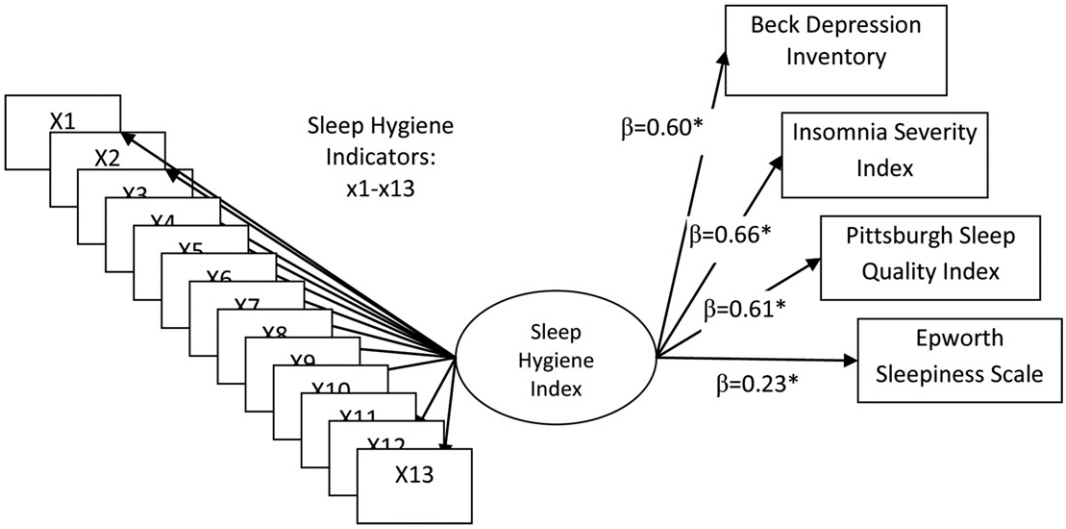

Fig. 1. Partial associations of latent variable, sleep hygiene, with depression, insomnia, poor sleep quality and sleepiness. All partial correlations in the diagram were significant at $p < .01$ level.

4. Discussion

Our findings supported the promising psychometric properties of the Sleep Hygiene Index. EFA and multi-sample CFAs indicated a uni-dimensional model of the sleep hygiene behaviors based on the measures of the Turkish version of the SHI in a clinical and a non-clinical community sample. Scale scores had comparatively good temporal stability over a three-week time for either clinical or non-clinical samples. Also the SHI had good internal reliability. In the correlation analyses, we found moderate linkages of the sleep hygiene to depression, insomnia and poor sleep quality and modest linkages to sleepiness. On the other hand, partial strong associations of the SHI scores with depression, insomnia severity, and poor sleep quality and partial moderate connections with sleepiness were all predictive of the construct validity of the scale. Our findings demonstrated that the Turkish version of the SHI has adequate validity and reliability.

Our item analysis and modification indices put forward that a much shorter measure of the SHI could be designed with comparable or better psychometric features relative to the present 13-item version. We found four pairs of items as item 2 and 3, item 6 and 7, item 8 and 13, and item 10 and 11, were significantly correlated with each other. Also item 4 had relatively low item reliability and validity. This item needs revision or can be discarded from the scale in the further studies.

Correlation analyses demonstrated that depression was positively correlated with the total scores of the SHI, suggesting that greater depression is associated with worse sleep hygiene. Both subscales and total scores of the SHI were positively correlated with sleep quality, suggesting that poorer sleep hygiene is associated with poorer sleep quality, which is consistent with prior studies [6,15] while minimal research has been conducted linking sleep quality and sleep hygiene practices. Sleep quality is importantly associated with sleep hygiene practices [24,25]. Therefore, there has been increased attention in the areas of sleep quality and sleep practice day to day [26,27]. The results confirmed the finding by Brown et al. that sleep hygiene is strongly related to the sleep quality [10]. Lebourgeois et al. conducted a study with 776 Italian and 572 American adolescents, to examine the relationship between self-reported sleep qualities and sleep hygiene practices. Italian adolescents had better sleep hygiene practices and substantially better sleep quality rather than American adolescents. The results of this study indicated a moderate relationship for both the Italian participants ($r = 0.40$, $p < 0.001$) and the American participants ($r = 0.46$, $p < 0.001$) between sleep quality and sleep hygiene practices [28]. Another study investigated sleep patterns and sleep practices of adults diagnosed with coronary heart disease via the Pittsburgh Sleep Quality Index and the Sleep Hygiene Index in southern Montana and the results indicated that poor sleep quality due to poor sleep efficiency and sleep practices [7].

Sleep hygiene is modestly related to perceptions of daytime sleepiness as would be expected in that poor sleep hygiene is thought to be related to poor sleep quality. Daytime napping has also been associated with poor sleep hygiene because of any sleep accumulated during the day may decrease an individual's sleep drive at night. Meanwhile, the relationship between sleep hygiene and insomnia severity has been rarely explored. Gellis et al. examined the prevalence of diverse sleep hygiene behaviors and their associations with insomnia severity in two independent samples of college students and they found that improper sleep scheduling predicted insomnia severity [29]. Our results also supported that insomnia severity is associated with poor sleep hygiene.

5. Conclusion

The findings of this present study suggest that the SHI may be a useful research or clinical assessment tool for evaluating

sleep hygiene to guide case formulation, treatment planning in depression as well as nonclinical population.

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References

[1] Karagözoglu S, Çabuk S, Tahta Y, Temel F. Some factors influencing the sleep of hospitalized adult patients. Turkısh Thorac J 2007;4: 234-40.
[2] Ozgen F. Sleep and sleep disorders. Psikiyatri Dünyası 2001;5:41-8.
[3] Guyton AC, Hall JE. Medical physiology: activity status of brain-sleep. Guyton and Hall textbook of medical physiology; 2001689-96.
[4] Hill LE, Cumming RG, Lewis R, Carrington S, Le C, Outeur DG. Sleep disturbances and falls in older people. J Gerontol 2007;62:62-6.
[5] Lee KA. Impaired sleep. In: Carrieri-Kohlman V, Lindsey AM, & West CM, editors. Pathophysiological phenomena in nursingSaunders; 2003. p. 363-85.
[6] Mastin DF, Bryson J, Corwyn R. Assessment of sleep hygiene using the Sleep Hygiene Index. J Behav Med 2006;29:223-7.
[7] Barker M. Description of sleep patterns and sleep hygiene practices or adults in cardiac rehabilitation programs in Southern Montana. A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Nursing. Bozeman, Montana: Montana State University; 2008.
[8] Brown FC, Buboltz WC, Soper B. Development and evaluation of the sleep treatment and education program for students. J Am Coll Health 2006;54:231-7.
[9] Stepanski EJ, Wyatt JK. Use of sleep hygiene in the treatment of insomnia. Sleep Med Rev 2003;7:215.
[10] Brown FC, Buboltz WC, Soper B. Relationship of sleep hygiene awareness, sleep hygiene practices, and sleep quality in university students. Behav Med 2002;28:33-8.
[11] American Academy of Sleep Medicine. International classification of sleep disorders, diagnostic and coding manual2nd ed.; 2005.
[12] Kawada T, Suzuki S. Circadian rhythm, monitoring sleep hours using a sleep diary and errors in rotating shiftworkers. Psychiatry Clin Neurosci 2002;56:213-4.
[13] Lacks P, Rotert M. Knowledge and practice of sleep hygiene techniques in insomniacs and good sleepers. Behav Res Ther 1986; 24:365-8.
[14] Blake DD, Gomez MH. A scale for assessing sleep hygiene: preliminary data. Psychol Rep 1998;83:1175-8.
[15] Cho S, Kim GS, Lee JH. Psychometric evaluation of the sleep hygiene index: a sample of patients with chronic pain. Health Qual Life Outcomes 2013;11:213.
[16] Bastien CH, Vallieres A, Morin CM. Validation of the Insomnia Severity Index as an outcome measure for insomnia research. Sleep Med 2001;2:297-307.
[17] Boysan M, Gülec M, Besiroglu L, Kalafat T. Psychometric properties of the Insomnia Severity Index in Turkish sample. Anatol J Psychiatry 2010;11:248-52.
[18] Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry Res 1989;28:193-213.
[19] Backhaus J, Junghanns K, Broocks A, Riemann D, Hohagen F. Test-retest reliability a nd validity of the Pittsburgh Sleep Quality Index in primary insomnia. J Psychosom Res 2002;53:737-40.
[20] Agargün MY, Kara H, Anlar O. The validity and reliability of the Pittsburgh Sleep Quality Index. Turk Psikiyatr Derg 1996;7:107-15.
[21] Johns MW. A new method for measuring daytime sleepiness: the Epworth sleepiness scale. Sleep 1991;14:540-5.
[22] Johns M. Rethinking the assessment of sleepiness. Sleep Med Rev 1998;2:3-15.
[23] İzci B, Ardıc S, Fırat H, Sahin A, Altınörs M, Karacan I. Reliability and validity studies of the Turkish version of the Epworth Sleepiness Scale. Sleep Breath 2008;12:161-8.
[24] Jefferson CD, Drake CL, Scofield HM, Myers E, McClure T, Roehrs T, et al. Sleep hygiene practices in a population based sample of insomniacs. Sleep 2005;28:611-5.
[25] Smith S, Trinder J. Detecting insomnia: comparison of four self-report measures of sleep in young adult population. J Sleep Res 2001;10: 229-35.
[26] Petit L, Azad N, Byszewski A, Sarazan FF, Power B. Nonpharmacological management of primary and secondary insomnia among older people: review of assessment tools and treatment. Age Aging 2003;32: 19-25.
[27] Öner P, Barut Y, Öner Ö, Üneri ÖŞ, Bodur Ş, Turgut S, et al. Reliability and validity of Turkish translation of the Pediatric Sleep Questionnaire. Bull Clin Psychopharmacol 2009;19:382-95.
[28] Lebourgeois MK, Giannotti F, Cortesi F, Wolfson AR, Harsh J. The relationship between reported sleep quality and sleep hygiene in Italian and American adolescents. Pediatrics 2005;115:257-65.
[29] Gellis LA, Park A, Stotsky MT, Taylor DJ. Associations between sleep hygiene and insomnia severity in college students: cross-sectional and prospective analyses. Behav Ther 2014;45:806-16.