ORIGINAL ARTICLE / ÖZGÜN MAKALE

https://doi.org/10.5455/JCBPR.299236
JCBPR 2018; 7(3):127–132

A Psychometric Investigation Into the Turkish Version of the SLEEP-50 Questionnaire

Abdullah YILDIRIM[1], Selahiddin ÖĞÜLMÜŞ[2], Onur YILMAZ[3], Murat BOYSAN[4]

[1]Department of Psychiatry, Kahramanmaraş Sütçü İmam University School of Medicine, Kahramanmaraş, Turkey

[2]Department of Guidance and Psychological Counseling, Faculty of Educational Sciences, Ankara University, Ankara, Turkey

[3]Department of Psychiatry, Van Yüzüncü Yıl University School of Medicine, Van, Turkey

[4]Department of Psychology, Faculty of Social Sciences, Van Yüzüncü Yıl University, Van, Turkey

Abstract

The aim of the study is to investigate the psychometric properties of the Turkish version of the SLEEP-50 Questionnaire (SLEEP-50), designed to assess probable caseness of sleep disorders in general population based on the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition Text Revision. Five hundred and twenty-two college students, aged between 18–44 years, participated in the study. Using the cutoff values informed by initial validation study, we detected the prevalence rates of sleep disorders. Internal consistency and test-retest reliability of the SLEEP-50 were evaluated. The Pittsburgh Sleep Quality Index (PSQI) was administered along with the questionnaire to assess convergent validity. The internal consistency of the overall questionnaire was excellent (Cronbach's α=0.91). Substantial kappa values showed that temporal stability of the SLEEP-50 was adequate. All sleep disorders detected by the SLEEP-50 were found to be significantly associated with the poor sleep quality as indexed by the PSQI. The Turkish version of the SLEEP-50 revealed adequate psychometric properties.

Keywords: Sleep disorders, sleep quality, instrumentation, reliability

Öz

Uyku-50 Ölçeği'nin Türkçe Formu'nun Psikometrik Özelliklerine Ilişkin Bir Araştırma

Bu çalışmanın amacı Ruhsal Bozuklukların Tanısal ve Sayımsal El Kitabı, DSM-IV TR'ye göre genel toplumda olası uyku bozukluklarının taranabilmesi için geliştirilmiş olan SLEEP-50 Ölçeği'nin Türkçe formunun geçerliğini değerlendirmektir. 18–44 yaş aralığındaki beş yüz yirmi iki üniversite öğrencisi çalışmaya katılmak için gönüllü olmuştur. Ölçme aracının orijinal geçerlik çalışmasında önerilen kesme noktaları kullanılarak uyku bozukluklarının yaygınlık oranları elde edilmiştir. SLEEP-50'nin iç tutarlılığı ve test tekrar test güvenilirliği değerlendirilmiştir. Ölçüt geçerliğini değerlendirebilmek için Pittsburgh Uyku Kalitesi İndeksi (PUKI) ölçme aracıyla birlikte uygulanmıştır. Ölçme aracına ilişkin mükemmel düzeyde iç tutarlılık değeri elde edilmiştir (Cronbach's α=0,91). İstatistik olarak önemli kappa değerleri SLEEP-50'nin yeterli kararlılık düzeyine sahip olduğunu göstermiştir. SLEEP-50'yle belirlenen uyku bozukluklarının hepsi PUKI'yle değerlendirilen uyku kalitesiyle ilişkili bulunmuştur. SLEEP-50'nin Türkçe formu yeterli psikometrik özellikler göstermiştir.

Anahtar Kelimeler: Uyku bozuklukları, uyku kalitesi, ölçekleme, güvenilirlik

Correspondence / *Yazışma:*
Abdullah YILDIRIM
Department of Psychiatry, Kahramanmaraş Sütçü İmam University School of Medicine, Kahramanmaraş, Turkey
Tel: +90 344 300 34 34 - 3748
E-mail: yldrmabdullah@yahoo.com

Received / *Geliş:* May 15, 2018
Accepted / *Kabul:* June 12, 2018

INTRODUCTION

Sleep problems are not rare in general population. Scholars have consistently reported almost two-thirds of respondents recruited from community based samples had sleep problems (Aslan et al., 2006; Benbir et al., 2015; Yildirim & Boysan, 2017). Sleep disturbances often causally involve in compromised quality of life (Garbarino, Lanteri, Durando, Magnavita, & Sannita, 2016; M. Gulec et al., 2013; T. C. Gulec et al., 2013; Zeitlhofer

et al., 2000) and impaired cognitive, emotional and daily functioning (Benitez & Gunstad, 2012; Boysan & Kagan, 2016; Kronholm et al., 2009), but more importantly in mental and physical health problems (Reid et al., 2006; Thomas, Redd, Wright, & Hartos, 2017).

Given the high prevalence rates of sleep disorders in general population (Ohayon, 2007, 2011), presence of reliable screening instruments is of monumental importance. Nevertheless, most of the sleep questionnaires have been designed to assess either aspects of sleep-related constructs or only one specific sleep disorder (Douglass et al., 1994; Hays, Martin, Sesti, & Spritzer, 2005; Jenkins, Stanton, Niemcryk, & Rose, 1988). The Sleep-50 Questionnaire was developed by Spoormaker, Verbeek, van den Bout, and Klip (2005) to respond to the need for a psychometric measure that can screen probable caseness in various sleep disorders together in general and clinical populations. Initial validation study demonstrated that the SLEEP-50 have excellent internal consistency with a Cronbach's alpha value of 0.85 for the entire scale-minus additional nightmare items 33 to 36 and sleep hygiene items 37 to 43. The initial validation study reported generally adequate reliability and validity for the questionnaire. SLEEP-50 has been utilized in a number of studies purported to detect sleep disorders in community population and their relevance to various psychological constructs.

The central focus of this study was to explore psychometric properties of the Turkish version of the SLEEP-50 in general population. To this end, prevalence rates of the sleep disorders listed in the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition Text Revision as indexed by the SLEEP-50 were computed for the data collected from college students. The associations between sleep quality as measured by the Pittsburgh Sleep Quality Index (PSQI) and various sleep disorders as detected by the subscales of the SLEEP-50 were evaluated. Temporal stability of sleep complaints based on the DSM-IV-TR over a one-month time period was assessed by obtaining kappa values between two applications of the questionnaire.

METHOD

Participants and procedure

Five-hundred twenty-two college students enrolled in various programs were recruited from Van Yüzüncü Yil University. The average age of the sample was 22.34 years (SD ±3.30). Almost half of the volunteers were female (n=308, 55.8%).

To ensure semantic, technical and conceptual equivalence between original English and translated versions, the SLEEP-50 was translated into Turkish by two clinicians with at least five years of experience. The research group compared these two translations and discussed on the translated questions item by item basis. Inappropriate items were revised, which led to the final version.

The approval for the procedure of this study was granted by Institutional Review Board of the Van Yüzüncü Yil University. All participants were briefly informed about the purposes and procedure of the study. Volunteers completed the psychometric instruments in their classes after the courses. All participants provided written consent and were not compensated for their participation.

Instruments

The SLEEP-50 and the PSQI were administered to college students.

SLEEP-50 Questionnaire (SLEEP-50)

The SLEEP-50 is a self-administered questionnaire designed to detect endorsement of probable caseness of DSM-IV TR sleep disorders as well as sleep hygiene (Spoormaker et al., 2005). The instrument consists of 50 items scored on a 4-point scale ranging from 1 (not at all) to 4 (very much) and yields nine subscales: Sleep Related Breathing Disorder or Sleep Apnea (Items 1–8), Insomnia (Items 9–16), Narcolepsy (Items 17–21), Restless Legs (Items 22–25), Circadian Rhythm Sleep Disorder (Items 26–28), Sleepwalking (Items 29–31), Nightmares (Items 32–36), Sleep Hygiene Factors (Items 37–43), and Impact of Sleep Complaints on Daily Functioning (Items 44–50). Seven subscales of the SLEEP-50 evaluate sleep complaints and Impact subscale was required for assessment of probable caseness of sleep disorders.

Pittsburgh Sleep Quality Index (PSQI)

The Pittsburgh Sleep Quality Index (PSQI) is a reliable and valid instrument assessing sleep quality and disturbances over a 1-month time interval (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). The measure consists of 19 self-report questions. The PSQI yields seven components representing the dimensions of sleep quality: Subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping

medication, and daytime dysfunction. The Turkish version of the PSQI adapted by Agargun, Kara, and Anlar (1996). A cut score of PSQI ≥5 discriminates well poor from good sleepers, and is an excellent general screening measure of sleep disturbances (Yildirim & Boysan, 2017).

Data Analysis

We began obtaining descriptive statistics for demographic variables and prevalence rates of sleep disorders in the study sample. Using logistic regression analysis in which poor sleep quality was dependent variable, we assessed the relations between sleep quality and sleep disorders.

We computed non-parametric kappa statistics to explore stability of sleep complains within cases between two administrations of the SLEEP-50 with a 30-day interval. Additionally, we performed test-retest intra-correlation analysis the summed scores on the subscales of the SLEEP-50 between two applications. Finally, Cronbach's alpha was used to evaluate internal reliability.

RESULTS

Regarding endorsement of sleep disorders as indexed by the SLEEP-50 subscales, 26.99% of the sample were at greater risk for breathing related sleep disorder, 31.88% reported insomnia, 50.91% had narcolepsy, 32.97% had restless legs/periodic limb movement disorder, 10.87% Circadian Rhythm Sleep Disorder, 9.06% reported sleepwalking, and 7.79% had nightmares. Of the participants, 61.41% of the subjects reported having at least one sleep disorder. On the other hand, eight in ten subjects reported having poor sleep quality (76.27%, n=421). Findings are reported in Table 1.

Table 1: Prevalence of probable sleep disorders caseness in the sample

	Cutpoint	*n*	*%*
Breathing Related Sleep Disorder	≥15	149	26.99%
Insomnia	≥19	176	31.88%
Narcolepsy	≥7	281	50.91%
Restless legs/ Periodic limb movement disorder	≥7	182	32.97%
Circadian Rhythm Sleep Disorder	≥8	60	10.87%
Sleepwalking	≥7	50	9.06%
Nightmares	≥9	43	7.79%
Affective Disorder	≥12	91	16.49%
Sleep State Misperception	-	5	0.91%
Hypersomnia	-	22	3.99%
Impact on Daily Functioning	≥15	339	61.41%
Poor sleep practices			
Bedroom—Too Light		53	9.60%
Bedroom—Too Noisy		69	12.50%
Alcohol at Night		46	8.33%
Smoke at Night		79	14.31%
Other Substances		32	5.80%
Feel Sad		102	18.48%
Anhedonia		88	15.94%
Pittsburg Sleep Quality Index	≥5	421	76.27%

To explore the relations between sleep disorders and sleep quality, we run logistic regression analyses in which participants scored 5 or greater than 5, reflective of poor sleep quality, were dependent variable. Sleep disorders each regressed on poor sleep quality. Breathing related sleep disorder (OR=3.319, p<0.001 confidence interval %=1.892–5.822), insomnia (OR=6.328, p<0.001 confidence interval %=3.387–11.824), narcolepsy (OR=3.856, p<0.001 confidence interval %=2.501–2.944), restless legs/periodic limb movement disorder (OR=2.522, p<0.001 confidence interval %=1.563–4.069), circadian rhythm sleep disorder (OR=3.787 p=0.005 confidence interval %=1.483–9.671), sleepwalking (OR=2.431 p=0.047 confidence interval %=1.012–5.842), and nightmares (OR=4.479 p=0.014 confidence interval %=1.362–14.727) were all significant correlates of poor sleep quality. Results are presented in Table 2.

To assess the extent to which stability of sleep complaints as measured by the SLEEP-50 within two applications, we computed non-parametric kappa values. Significant kappa values evidenced for that sleep complaints as rated on the subscales of the SLEEP-50 had substantial temporal stability over a 30-day time course. Affective disorders and hypersomnia were two exceptions that we observed unsubstantial overlaps within cases on these sleep complaints between repeated measures. This was probably due to that very small number of cases in these two subscales revealed unsubstantial results. Intra-correlation coefficients were modest for restless legs/periodic limb movement disorder, circadian rhythm sleep disorder, sleepwalking and nightmares. Internal reliability of the SLEEP-50 total and

subscales was excellent with two exceptions of circadian rhythm sleep disorder and nightmares. Results are reported in Table 3.

Table 2: Logistic regression analyses on poor sleep quality

	Cutpoint	*Odds ratio*	*P*	*95% CI*
Breathing related sleep disorder	≥15	3.319	<0.001	1.892–5.822
Insomnia	≥19	6.328	<0.001	3.387–11.824
Narcolepsy	≥7	3.856	<0.001	2.501–2.944
Restless legs/ periodic limb movement disorder	≥7	2.522	<0.001	1.563–4.069
Circadian rhythm sleep disorder	≥8	3.787	0.005	1.483–9.671
Sleepwalking	≥7	2.431	0.047	1.012–5.842
Nightmares	≥9	4.479	0.014	1.362–14.727
Affective disorder	≥12	11.275	<0.001	3.504–36.279
Sleep state misperception	-	1.562	0.685	0.181–13.495
Hypersomnia	-	1.060	0.910	0.384–2.932
Impact on daily functioning	≥15	4.046	<0.001	2.677–6.113

Significant P values are boldfaced.

DISCUSSION

College students report a host of sleep difficulties, which may affect academic performance, emotion regulation, and physical and mental health (Buboltz, Brown, & Soper, 2001; Ram, Seirawan, Kumar, & Clark, 2010; Taylor, Bramoweth, Grieser, Tatum, & Roane, 2013). However, using SLEEP-50, we detected excessive amount of cases (61.4%) who had at least one type of sleep disorder in a general population survey. Our finding far exceeded than the risk for prevalence rates of sleep disorders observed in preceding general population studies (Gaultney, 2010). However, in consistent with this high endorsement rate, sleep complaints as measured by the PSQI were reported by almost 3 in 4 respondents (76.3%). A possible account for these findings is that sleep disturbances are hallmark of posttraumatic stress disorder (PTSD) (Germain, 2013). The Van earthquake with a magnitude of 7.3 stuck to the region in September 2011. The previous studies have well-documented the high prevalence rates of PTSD among earthquake exposed general population in Van, Turkey (Kadak, Boysan, Ceylan, & Ceri, 2014; Kadak, Nasiroglu, Boysan, & Aydin, 2013). Therefore, disproportionately high rates of sleep disorders among a college student population may be attributed to emotional regulation difficulties tentatively associated with the prior earthquake.

Table 3: Internal reliability alpha coefficients, test retest correlations, and kappa values for endorsement of sleep complaints between two applications of the SLEEP-50

			Time 1		*Time 2*			
	α	*r*	*n*	*%*	*N*	*%*	*κ value*	*Approx. P*
Breathing related sleep disorder	0.749	0.797	6	12%	4	8%	0.336	0.015
Insomnia	0.824	0.731	10	20%	7	14%	0.507	<0.001
Narcolepsy	0.715	0.793	23	46%	28	56%	0.643	<0.001
Restless legs/ periodic limb movement disorder	0.728	0.665	9	18%	10	20%	0.416	0.003
Circadian rhythm sleep disorder	0.520	0.511	4	8%	6	12%	0.336	0.015
Sleepwalking	0.749	0.652	1	2%	2	4%	0.658	<0.001
Nightmares	0.576	0.647	2	4%	1	2%	0.658	<0.001
Impact of sleep complaints on daily functioning	0.830	0.755	21	42%	17	34%	0.578	<0.001
Affective disorder	0.697	0.689	5	10%	2	4%	-0.061	0.630
Sleep state misperception ‡	-	-	0	0%	0	0%	1.000	***
Hypersomnia	-	-	2	4%	2	4%	-0.042	0.768

N=50 college students. r=intra-correlation coefficients between two applications with a 30-day interval. Due to the low frequency of endorsement of sleep complaints in the test retest group, the rates of endorsement of sleep disorders given the functional impairment (Impact subscale ≥15) were not considered. ‡ There was no case identified in the first and second application of the screening tool. Significant P values are bold faced. Cronbach's α=0.911 for the overall SLEEP-50 and α=0.755 for the factors influencing sleep (sleep hygiene) subscale of the SLEEP-50. Significant P values are boldfaced.

Of special interest was that almost half of the sample rated endorsement of narcolepsy (50.9%). Although other types of sleep complaints also were prevalent, the anomaly in this rate may be due to some measurement error in the Narcolepsy scale of the SLEEP-50 which also was pronounced in the initial validation study undertaken by Spoormaker et al. (2005). Notably, this scale was the most problematic one in which one of the items in the subscale was loaded on the impact on the daily functioning and another was complex loading on both Narcolepsy and Nightmares sub-scales. Therefore, as the same was true in another study (Gaultney, 2010), high endorsement of narcolepsy may be construed as not a pure indicator of this type rather reflecting other sleep complaints as well.

Despite the problems in the Narcolepsy scale, this validation study generally identified adequate psychometric properties and promising results for the questionnaire. The Turkish version of the SLEEP-50 revealed higher internal consistency than reported in the initial validation study. The internal consistency coefficient for the Circadian Rhythm Disorder scale was too low, which was greater than the value reported in the initial development study of the questionnaire. Test-retest kappa values reflective of good agreement levels between cases identified in two repeated measurements with a 30-day interval were significant, with an exception of Hypersomnia scale. This was probably due to the small number of cases observed at two time points (n=2 at each measurement). As was in the initial validation study, temporal stability indicated by intra-correlation coefficients was good for the SLEEP-50. Subscales of the SLEEP-50 revealed significant associations with poor sleep quality. These findings can be interpreted in way that the questionnaire had adequate reliability and validity.

Severe limitations of this study should be kept in mind. The sample consisted of college students and lack of clinical samples with sleep disorders was the major drawback of this investigation. Subjective measures of sleep disturbances were utilized in this study. Objective measures of sleep such as polysomnography could have provided more reliable data to assess reliability and validity of the SLEEP-50. A diagnostic measure of sleep disorders could have provided more reliable evidence for the construct validity of the Turkish version of the SLEEP-50. Moreover, using a structured clinical review for detecting sleep disorders could have provided more reliable information about the precise prevalence rates of sleep disorders.

Despite the limitations of this investigation, given the paucity of sleep surveys in Turkish general population, the present data evidence for the prevalence and importance of probable caseness of sleep problems among community based samples. In addition, validation of the Turkish version of the SLEEP-50 would allow researchers to detect probable caseness of sleep complaints in further studies in clinical and non-clinical samples.

REFERENCES

Agargun, M. Y., Kara, H., & Anlar, Ö. (1996). Validity and reliability of the Pittsburgh Sleep Quality Index. Turkish Journal of Psychiatry, 7(2), 107–115.

Aslan, S., Gulcat, Z., Albayrak, F. S., Maral, I., Yetkin, S., Sutcigil, L. Aydin, H. (2006). Prevalence of insomnia symptoms: results from an urban district in Ankara, Turkey. International Journal of Psychiatry in Clinical Practice, 10(1), 52-58. https://doi.org/10.1080/13651500500410364

Benbir, G., Demir, A. U., Aksu, M., Ardic, S., Firat, H., Itil, O. Karadeniz, D. (2015). Prevalence of insomnia and its clinical correlates in a general population in Turkey. Psychiatry and Clinical Neurosciences, 69(9), 543-552. https://doi.org/10.1111/pcn.12252

Benitez, A., & Gunstad, J. (2012). Poor sleep quality diminishes cognitive functioning independent of depression and anxiety in healthy young adults. Clinical Neuropsychologist, 26(2), 214-223. https://doi.org/10.1080/13854046.2012.658439

Boysan, M., & Kagan, M. (2016). Associations between career decision-making difficulties, maladaptive limitedness schemas, sleep quality, and circadian preferences among Turkish college students. Sleep and Hypnosis, 18(4), 97-110. https://doi.org/10.5350/Sleep.Hypn.2016.18.0124

Buboltz, W. C., Brown, F., & Soper, B. (2001). Sleep habits and patterns of college students: A preliminary study. Journal of American College Health, 50(3), 131-135. https://doi.org/10.1080/07448480109596017

Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. Psychiatry Research, 28(2), 193-213. https://doi.org/10.1016/0165-1781(89)90047-4

Douglass, A. B., Bornstein, R., Ninomurcia, G., Keenan, S., Miles, L., Zarcone, V. P. Dement, W. C. (1994). The Sleep Disorders Questionnaire-I: Creation and multivariate structure of SDQ. Sleep, 17(2), 160-167. https://doi.org/10.1093/sleep/17.2.160

Garbarino, S., Lanteri, P., Durando, P., Magnavita, N., & Sannita, W. G. (2016). Co-morbidity, mortality, quality of life and the healthcare/welfare/social costs of disordered sleep: a rapid review. International Journal of Environmental Research and Public Health, 13(8). https://doi.org/10.3390/ijerph13080831

Gaultney, J. F. (2010). The prevalence of sleep disorders in college students: Impact on academic performance. Journal of American College Health, 59(2), 91-97. https://doi.org/10.1080/07448481.2010.483708

Germain, A. (2013). Sleep disturbances as the hallmark of PTSD: Where are we now? American Journal of Psychiatry, 170(4), 372-382. https://doi.org/10.1176/appi.ajp.2012.12040432

Gulec, M., Selvi, Y., Boysan, M., Aydin, A., Oral, E., & Aydin, E. F. (2013). Chronotype effects on general well-being and psychopathology levels in healthy young adults. Biological Rhythm Research, 44(3), 457-468. https://doi.org/10.1080/09291016.2012.704795

Gulec, T. C., Yoruk, O., Gulec, M., Selvi, Y., Boysan, M., Oral, E., . . . Mazlumoglu, M. R. (2013). Benefits of submucous resection on sleep quality, daytime and dream anxiety in patients with nasal septal deviation. Sleep and Biological Rhythms, 11(4), 227-236. https://doi.org/10.1111/sbr.12026

Hays, R. D., Martin, S. A., Sesti, A. M., & Spritzer, K. L. (2005). Psychometric properties of the Medical Outcomes Study Sleep measure. Sleep Medicine, 6(1), 41-44. https://doi.org/10.1016/j.sleep.2004.07.006

Jenkins, C. D., Stanton, B. A., Niemcryk, S. J., & Rose, R. M. (1988). A scale for the estimation of sleep problems in clinical research. Journal of Clinical Epidemiology, 41(4), 313-321. https://doi.org/10.1016/0895-4356(88)90138-2

Kadak, M. T., Boysan, M., Ceylan, N., & Ceri, V. (2014). Psychometric properties of the Turkish version of the Child PTSD Symptom Scale. Comprehensive Psychiatry, 55(6), 1435-1441. https://doi.org/10.1016/j.comppsych.2014.05.001

Kadak, M. T., Nasiroglu, S., Boysan, M., & Aydin, A. (2013). Risk factors predicting posttraumatic stress reactions in adolescents after 2011 Van earthquake. Comprehensive Psychiatry, 54(7), 982-990. https://doi.org/10.1016/j.comppsych.2013.04.003

Kronholm, E., Sallinen, M., Suutama, T., Sulkava, R., Era, P., & Partonen, T. (2009). Self-reported sleep duration and cognitive functioning in the general population. Journal of Sleep Research, 18(4), 436-446. https://doi.org/10.1111/j.1365-2869.2009.00765.x

Ohayon, M. M. (2007). Prevalence and comorbidity of sleep disorders in general population. La Revue du Praticien, 57(14), 1521-1528.

Ohayon, M. M. (2011). Epidemiological overview of sleep disorders in the general population. Sleep Medicine Research, 2(1), 1-9. https://doi.org/10.17241/smr.2011.2.1.1

Ram, S., Seirawan, H., Kumar, S. K. S., & Clark, G. T. (2010). Prevalence and impact of sleep disorders and sleep habits in the United States. Sleep and Breathing, 14(1), 63-70. https://doi.org/10.1007/s11325-009-0281-3

Reid, K. J., Martinovich, Z., Finkel, S., Statsinger, J., Golden, R., Harter, K., & Zee, P. C. (2006). Sleep: A marker of physical and mental health in the elderly. American Journal of Geriatric Psychiatry, 14(10), 860-866. https://doi.org/10.1097/01.JGP.0000206164.56404.ba

Spoormaker, V. I., Verbeek, I., van den Bout, J., & Klip, E. C. (2005). Initial validation of the SLEEP-50 questionnaire. Behavioral Sleep Medicine, 3(4), 227-246. https://doi.org/10.1207/s15402010bsm0304_4

Taylor, D. J., Bramoweth, A. D., Grieser, E. A., Tatum, J. I., & Roane, B. M. (2013). Epidemiology of insomnia in college students: Relationship with mental health, quality of life, and substance use difficulties. Behavior Therapy, 44(3), 339-348. https://doi.org/10.1016/j.beth.2012.12.001

Thomas, K., Redd, L., Wright, J., & Hartos, J. (2017). Sleep and mental health in the general population of elderly women. Journal of Primary Prevention, 38(5), 495-503. https://doi.org/10.1007/s10935-017-0484-5

Yildirim, A., & Boysan, M. (2017). Heterogeneity of sleep quality based on the Pittsburgh Sleep Quality Index in a community sample: a latent class analysis. Sleep and Biological Rhythms, 15(3), 197-205. https://doi.org/10.1007/s41105-017-0097-7

Zeitlhofer, J., Schmeiser-Rieder, A., Tribl, G., Rosenberger, A., Bolitschek, J., Kapfhammer, G., . . . Kunze, M. (2000). Sleep and quality of life in the Austrian population. Acta Neurologica Scandinavica, 102(4), 249-257. https://doi.org/10.1034/j.1600-0404.2000.102004249.x