



PSQI Estimation in the Sample of Russian Students

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ABSTRACT

Sleep-related problems are common for young people like students and schoolchildren. The Pittsburgh Sleep Quality Index (PSQI) is a widely used measure of sleep quality in adolescents, but information regarding its psychometric strengths and weaknesses in Russian population is limited. Study goal was to evaluate sleep quality in the sample of Karelian students and compare with previous studies from other countries. A total number of 333 students from Petrozavodsk University and High Pedagogic School participated in this study (234 girls, 96 boys). Mean age was 17.75 ± 1.9 years. The mean global PSQI score was 6.16 ± 2.8 (median 6, range 0-17) with 56% of the participants experiencing poor sleep quality (> 5), and 19,5% reporting extremely poor sleep quality (≥ 8). Women had higher PSQI scores (6.59 ± 2.89) compared to men (4.89 ± 2.80). This is the first study in students from Russian Karelia, and it shows that sleep quality in our sample is affected by sex and not age.

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Keywords:

Sleep quality; sleep disturbance; adolescence; stress; college students

Introduction

Sleep-related pathologies also called disorders are among major health issues in the world. The estimated prevalence of sleep problems in the general population range between 16% and 24%, and prevalence as high as 60% has been reported in the elderly population (Mellinger, Balter, & Uhlenhuth, 1985). Low sleep quality has been associated with increased anxiety, irritability, depression, confusion and generally lower life satisfaction (Pilcher, Ginter, & Sadowsky, 1997). Students have been identified as a population group particularly affected by problems with sleep (Bulbultz, Franklin, & Barlow, 2001; Pallos, Yamada, Doi, & Okawa, 2004; Carney, Edinger, Meyer, Lindman, & Istre, 2006). A majority of university students are in late adolescence transition to adult life and, due to the stress of education and the academic workload, their sleep patterns and related problems could differ from non-students of their age (Fukuda & Ishihara, 2001). Most of the studies examining sleep patterns among college students have focused on the relationship between sleep habits and academic performance (Trockel, Barnes, & Egget, 2000; Gaultney, 2010; Buboltz, Brown, & Soper, 2001) and mental health problems (i.e., stress, depression and suicidal ideation) (Sing & Wong, 2010; Kenney, LaBrie, Hummer, & Pham, 2012; Nyer et al., 2013; Nadorff, Nazem, & Fiske, 2011; Carskadon & Davis, 1989). All the studies concede that college students experience frequent and sometimes severe sleep problems that negatively impact their health and well-being (Trockel, Barnes, & Egget, 2000; Gaultney, 2010; Buboltz, Brown, & Soper, 2001; Sing & Wong, 2010). Overall, estimates of sleeping problems/disturbances among college students ranged between 13.8% and 68.6% depending on the definition and measurement used (Sing & Wong, 2010; Kenney, LaBrie, Hummer, & Pham, 2012). In a 2012

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US survey of college students ($n = 99,066$), 26.4% reported sleep difficulties during the previous 12 months as being “traumatic or very difficult to handle”, and 57.1% of the sample reported having enough sleep to feel rested on fewer than four days a week. In a study examining sleep/wake patterns over the transition from high school to college, Carskadon and Davis found a significant reduction in the number of hours of sleep, as well as delay in onset of night time sleep, as students transition to college. In addition to the amount of sleep, the quality of sleep seems to be changing and impacting the well-being of college students (Trockel, Barnes, & Egget, 2000; Buboltz, Brown, & Soper, 2001; Megdal & Schernhammer, 2007). Using the Pittsburgh Sleep Quality Index (PSQI), Lund identified 63.9% of college students in her sample ($N=1,125$) as poor-quality sleepers, those who experience restricted total sleep, erratic sleep schedules, and/or sleep disturbances (Lund, Reider, Whiting, & Prichard, 2010). Along the same line, Gaultney found that 27% of college students ($N = 1,845$) were at risk for sleep disorders likely to disturb sleep (Gaultney, 2010). When Pilcher and co-investigators looked at the impact of sleep quantity and quality on the health of college students, they found sleep quality to be a better predictor than sleep quantity of several measures of health including health complaints, depression, fatigue and sleepiness. Results from these studies reveal an unquestionable problem of insufficient and poor quality sleep among adolescents and young adults, as well as growing levels of sleep dissatisfaction (Hicks, Fernandez, & Pellegrini, 2001). The extent of sleep-related problems among Russian university students is unknown. In a country like Russia, where there are many different time zones and nationalities, a rating scale would be an invaluable and versatile tool to estimate sleep-related problems in this subpopulation. The most widely used sleep instrument is the Pittsburgh Sleep Quality Index (PSQI). The PSQI (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989), introduced in 1989, has acquired extensive acceptance as a useful instrument in measuring sleep quality in diverse groups of patients. The questionnaire is easy to understand and can be completed in 5 min or less. It has been shown to have good validity for patients with psychiatric and sleep disorders (Doi, Minowa, Uchiyama, Okawa, Kim, Shibui, & Kamei, 2002) and for patients with other somatic diseases (Carpenter, & Andrykowski, 1998). It has also been used among student populations in Japan (Pallos, Gergely, Yamada, Miyazaki, & Okawa, 2005), Korea (Lee et al., 2016), US (Lund, Reider, Whiting, & Prichard, 2010) and other countries. PSQI measures sleep disturbance and usual sleep habits during the prior month. It is self-administered questionnaire, score of >5 having a diagnostic sensitivity of 89.6% and specificity of 86.5% to distinguish “poor” sleepers (depressed patients) from “good” sleepers (healthy subjects). Our goal was to evaluate sleep quality in the sample of Karelian students and compare it with previous studies from other countries.

Methods

Participants

The study was carried out anonymously and voluntarily throughout the winter months from 2013 to 2014 in the city of Petrozavodsk (61.78° N, 34.33° E), which is located in northwest Russia.

A total number of 333 students from University and High Pedagogic school participated in this study (234 girls, 96 boys). Mean age was 17.75 ± 1.9 years with a range between 15 and 26 years.

Questionnaires were distributed to the University students by lecturers or school psychologists to the High School students. Students filled out the questionnaires in the classroom. At the time when the survey was carried out, approximately 90% of respondents had lived in the places of residence that they indicated in the questionnaire for more than 5 years. On average, classes start at 8:30 in the morning in Karelia.

Instruments

Pittsburg sleep quality index. Sleep quality was assessed via a translated version into Russian of the Pittsburgh Sleep Quality Index (PSQI), which evaluates the quality of sleep over the past month [25]. This measure consists of ten questions that include seven components: subjective quality of sleep, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, daytime sleepiness, and disturbances during the day. The maximum PSQI score is 21 points, determined by the sum of the seven components. Each component is given a score between zero and three points. These scores are then combined to generate an overall PSQI score; the higher the score, the worse the quality of sleep. An overall PSQI score > 5 points indicates that the individual has difficulties in at least two components or moderate

difficulties in more than three components. In the end, it is common to classify subjects into two groups: good (PSQI<5) and poor sleepers (PSQI>5).

Demographic data. In addition, each participant had to indicate the date when the form was completed as well as residence / place of study, residence in the local area and personal data: gender, and age. Table 1 presents descriptive characteristics for the respondents. Lecturers or school psychologists distributed the questionnaires to the students. The respondents in classrooms completed all the questionnaires.

Statistical Analyses

Only full datasets were analysed. We present descriptive scores and calculated t-test for differences and Pearsons correlations for relationships. This study was approved by the ethics committee at the Petrozavodsk Center for Education Control approval # 21/20/187 from 26.02.14. The research has been conducted in an ethical and responsible manner, in full compliance with all relevant codes of experimentation and legislation. All the work was done at Common Core Facility of Institute of Biology Karelian Research Center Russian Academy of Sciences.

Results

Socio-demographic and sleep-related data were presented in Table 1.

Table 1. Sociodemographic characteristics of university students by gender - Petrozavodsk, RUSSIA, 2016

Characteristics	Total n (%)	Gender				p-value ^b
		Men		Women		
		n (%)	n (%)	n (%)	n (%)	
Age group (years) (n=333)						
15 to 17	210 (63.1)	70 (33.3)	140 (66.7)		0.52	
18 to 22	117 (35.1)	23 (19.6)	94 (80.4)			
23 to 26	6 (3.8)	3 (50.0)	3 (50.0)			
Marital status (n=330)						
Married/Partnership	20 (6.0)	3 (3.2)	17 (5.0)			
Single	306 (91.9)	93 (96.8)	214 (91.4)			
Separated	4 (2.1)	0 (0.0)	4 (3.6)			
Who the student lives with (n=333)						
Alone	9 (2.7)	19 (20.3)	51 (21.6)		0.723	
Parents	266 (79.8)	65 (67.3)	143 (66.8)			
Relatives (siblings, uncles/aunts, cousins)	53 (15.9)	3 (4.2)	34 (14.6)			
Partner	15 (4.5)	9 (9.4)	6 (2.5)			

Out of the 400 participants contacted, 57 refused participation and 10 had incomplete data, so only a total of 333 questionnaires were analyzed. The mean age of the participants in years was 17.75 ± 1.9 . There were 234 (70.3%) females. The average wake-up time on working days was 7.08 (SD 1.00), and the average wake-up time on weekend was 11.44 (SD 2.60). The average number of minutes to fall asleep was 27.42 (SD 15.54), and the average hours of sleep per night was 6.95 (SD 1.20).

Results of the PSQI are presented in Figure 1. The mean global PSQI score was 6.16 ± 2.8 (median 6, range 0-17) with 56% of the participants experiencing poor sleep quality (> 5), and 19,5% reporting extremely poor sleep quality (≥ 8).

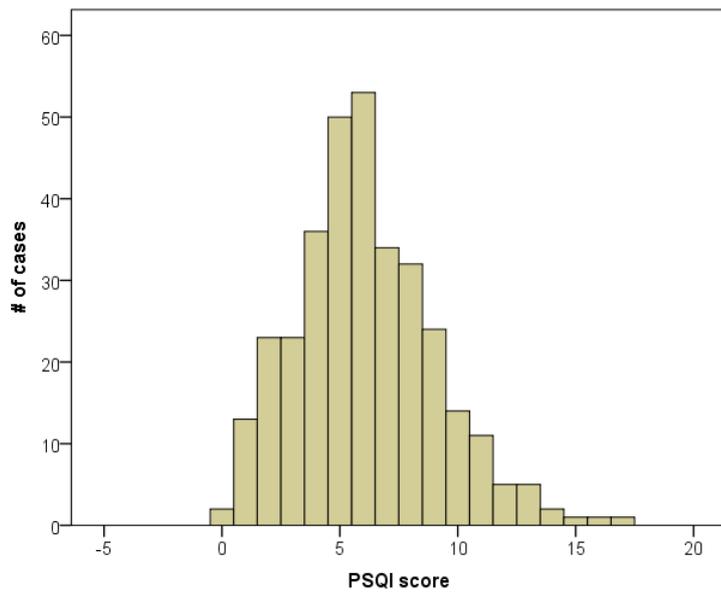


Figure 1. PSQI score distribution in the sample of Karelian students.

PSQI scores differed between males and females (T-Test: $T=4.917$, $df= 328$, $p<0.001$). Women had higher PSQI scores (6.59 ± 2.89) and therefore more sleep problems compared to men (4.89 ± 2.80).

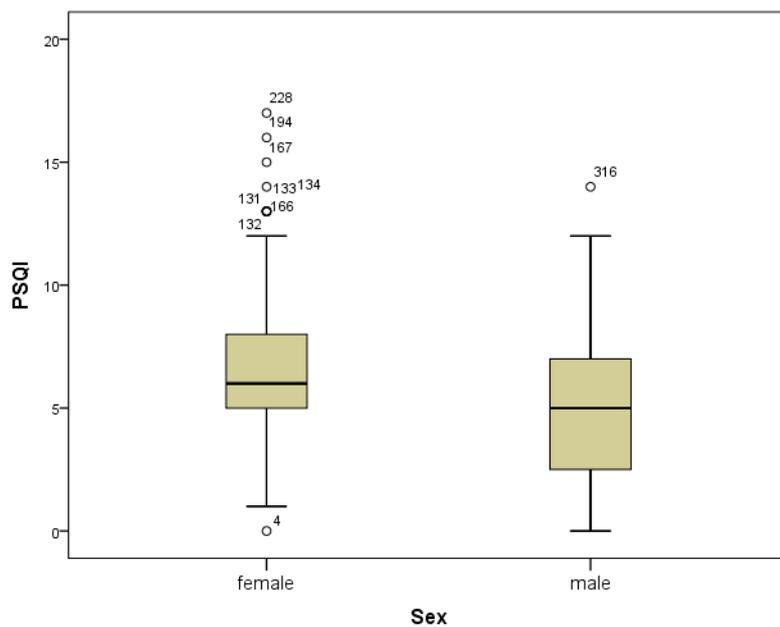


Figure 2. Sex difference in PSQI scores.

It was found that age was uncorrelated with PSQI scores ($r=0.021$, $p=0.703$) in our sample.

Discussion

The current study consisted of a 333-student sample with a mean age of 17.75 years. This sample allowed for the assessment of relationships with individuals who were full-time students. Our work was aimed at evaluating sleep quality in the sample of Karelian students. To our knowledge, this study is the first to examine the usefulness of a sleep screening instrument among university students in Russian North-West. Researchers say that puberty is a crucial period for the development of cardiovascular risk factors while recommending interventions to avoid unfavorable outcomes in adulthood (Pallos et al, 2004). The detection of sleep problems among university students becomes especially important due to the lifestyle led by this population. These individuals often live alone or with colleagues, begin unhealthy food habits, do not eat during scheduled times, and work or study at night.

Values of PSQI. In agreement with the authors of the instrument and studies done worldwide, we found the best cut-off score for the PSQI among our university students to be 5 and above. 56% of the participants experienced poor sleep quality and 19.5% extremely poor sleep quality. This is among the range of the other previous studies (Lund et al., 2010; Aloba, Adewuya, Ola, & Mapayi, 2007) and shows that students in Russian Karelia also have sleep difficulties. Meanwhile, our sample is younger than age ranges that have been observed among university samples from other studies (Lund et al., 2010; Megdal, & Schernhammer, 2007). That explains contradiction in data received from another groups (Ban & Lee, 2001; Kang & Chen, 2009). The physiological processes that occur during sleep are necessary for the maintenance of physical and cognitive activity. Disorders associated with poor sleep quality can impair performance in school, work, and social relationships. Sleep disorders are also associated with an increased risk of accidents (Carney et al., 2006). Therefore, university students who lack adequate sleep quality might see learning and academic performance worsening as a result. This can predispose this population to cognitive and psychosomatic problems (Fukuda, & Ishihara, 2001; Lund et al., 2010). In addition to the damage caused by sleep disorders alone, additional risks exist due to the association between these disorders and poor sleep quality with obesity, central obesity, and other anthropometric data.

Sex differences. According to our data, statistically significant differences were found between sexes. This complies with other studies on this topic, for example with Lund et al. (Lund et al., 2010; Megdal & Schernhammer, 2007). On the other hand, other works found no statistically significant association between gender and sleep quality among students (Ban & Lee, 2001; Kang & Chen, 2009) Also, it should be noted prevalence of female subjects in our sample. It could be explained by the fact that our study held at faculties more popular among girls.

Age. We found no correlation between age and PSQI values. This could be explained by relatively small and homogenous by age sample in our study.

Limitations. Our study has several limitations. First, small sample size in our study. Second, the PSQI is a subjective measure of sleep. Thus, our analysis was based on self-reported data rather than on direct measurements. Since this is a relatively new area of study, another limitation of this research is the lack of relevant literature on the subject, preventing a more detailed analysis of the results. Therefore, new studies are needed to clarify the real influence of parameters on sleep quality in students.

Conclusion

The present study showed that cognitive performance of Tunisian children are time-of-day dependent, with the best values observed in the morning for CA and best one in the afternoon for choice RT. These cognitive performances are also day of test dependent, with the best values observed in the middle of week and worst one in the beginning and the end of week. Nevertheless, these rhythms of cognitive performance are desynchronized from the rhythm of core temperature.

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