POOR SLEEP, ANXIETY AND DEPRESSION AMONG HEALTH SCIENCES AND MARITIME STUDENTS

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Abstract

Aim of the study was to evaluate the presence of poor sleep, depression and anxiety, according to the students’ gender, age, year of studying and institution.

Methods. The study sample consisted of 400 Klaipeda State University of Applied Sciences students (96.8% female) and 393 The Lithuanian Maritime Academy students (78.9% male), from 18 to 46 years of age. Pittsburgh Sleep Quality Index (PSQI) was used for subjective sleep quality evaluation. Hospital Anxiety and Depression (HAD) scale was used to identify depression and anxiety. PSQI score ≤ 5 was evaluated as good sleep quality; > 5 – poor sleep. HAD score from 0 to 7 was evaluated as no depression or anxiety, score >7 indicated depression and/or anxiety.

Results. Lithuanian Maritime Academy students had significantly lower prevalence of poor sleep, as compared to the students of the Faculty of Health Sciences, 38.8% vs 61.2%, p<0.001. The students of Lithuanian Maritime Academy had significantly lower anxiety score, as compared to the students of Health Sciences, 7.45 vs 8.63, p<0.001. Anxiety was higher (8.94) among the students older than 22 years, as compared to 18-19 years old ones (7.17), p<0.001, also among third year students (9.17), as compared to the first one (7.25).

Conclusions. Health sciences students more frequently, as compared to maritime students, had poor sleep or anxiety. Depression and anxiety scores were higher in female, older and studying third year students.

KEYWORDS: poor sleep, anxiety, depression, students, health sciences, maritime.

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Introduction

Scientific findings indicate that up to 40% of the students in different countries, studying medicine, complained about poor sleep: 16% in Malaysia (Zailinawati et al., 2009), 19% in China (Feng et al., 2005), 28.2% in Brazil (Loayza, 2001), 40% in Lithuania (Preišegolavičiūtė et al., 2010), 40.6% in Iran (Ghoreishi et al., 2008). It was noticed that the prevalence of poor sleep among medical students varied from country to country because of different measurement tools used, and also was related with students’ age, gender and family status (Azad et al., 2015). Poor sleep in medical students is mainly related with high level of stress, it was confirmed by the results of systematic literature review of 40 articles (Dyrbye et al., 2006). The relationship among the students’ poor sleep, stress and academic performance was analyzed, and it was found that poor sleep quality correlated with worsened academic performances (Ahrberg et al., 2012). This correlation could be explained by the results of literature review (Fortier-Brochu et al., 2012), which demonstrated that persons, which sleep was poor, had higher levels of cognitive function impairment in memory, as compared to those who had normal sleep. Good sleep quality is essential for medical students, because the importance of acquiring sufficient sleep is reflected in the role, played in patients’ wellbeing and outcomes, in addition to their own wellbeing and career success (Alsaagaf et al., 2016).

Major depressive disorder and generalized anxiety disorder are higher among medical students during their studies and internships than the prevalence of these diseases in the general U.S. population (Mousa et al., 2016). Raising awareness among medical students and trainees of the high prevalence of psychological distress and mental health issues may de-stigmatize these diagnoses and facilitate open discussion of the psychological effects of their training on their life (Mousa et al., 2016).

Maritime student are more vulnerable to stress at work, as compared with merchant marine officers, working minimum 15 years at sea. Stress at sea, experienced by students, is related with social relations, the lack of control and the lack of support (Jeżewska et al., 2006).
Even 70% of seafarers had poor sleep while working at sea (Sąlyga and Kušleikaitė, 2011). Difficulties falling asleep were reported by 24%, wakefulness 44.6%, waking up due to fatigue 6.2%, superficial sleep 43.4% (Sąlyga and Kušleikaitė, 2011).

There is an evidence to suggest that poor sleep presents at alarming levels in the student population, especially studying health sciences. The research in the area of students’ sleep quality and mood disorders is lacking in Lithuania, as well as other European countries. There were no studies in Lithuania analyzing the sleep quality in students studying different study programs in health and maritime sciences.

**The aim** of this study was to evaluate the presence of poor sleep, depression and anxiety, according to the students’ gender, age, year of studying and institution.

**Material and Methods**

**Study sample**

The survey was conducted twice - in March 2014 and March 2016. The study sample consisted of 400 Klaipeda State University of Applied Sciences students (96.8 % were female) and 393 The Lithuanian Maritime Academy students (78.9 % of them males), from 18 to 46 years of age. The first (36.8%), the second (33.0%), the third (30.2%) year students were involved in the study. Mean age of the students was 20.836 (SD=2.632). The grouping was performed according to the age: 18-19 years (26.1%), 20 (26.1%) and 21 years (26.4%), and ≥22 years (21.4%). Frequency of the subjectively perceived sleep quality, anxiety and depression was compared in gender, age groups, studying year groups and different institution groups.

The study was approved by Bioethics Committee of Klaipeda State University of Applied Sciences.

**Questionnaires**

Pittsburgh Sleep Quality Index (PSQI) (Buysse et al., 1989) was used for subjective sleep quality evaluation. PSQI is a self-rated questionnaire which assesses sleep quality over a 1-month time interval. 19 individual items generated seven “component” scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The sum of scores for these seven components yielded one global score, with a range of 0-21 points, “0” indicating no difficulty, and “21” indicating severe difficulties in all areas. PSQI score ≤ 5 was evaluated as good sleep quality; > 5 – poor sleep.

Hospital Anxiety and Depression (HAD) scale (Zigmond & Snaith, 1983), a self-assessment scale was used to identify the presence of depression and anxiety during the past week. The HAD scale has in total 14 items, with responses being scored on a scale of 0-3, with 3 indicating higher symptom frequencies. Score for each subscale (anxiety and depression) ranged from 0-21 with scores categorized as follows: normal (0-7), disorder (>7). Scores for the entire scale (emotional distress) ranged from 0-42, with higher scores indicating more distress. Prior to completing the scale respondents were asked to “fill it complete in order to reflect how they have been feeling during the past week” (Zigmond & Snaith, 1983).

Additional sociodemographic questions about respondents’ age, gender, study programme and year of the studying were included in the questionnaire.

**Statistical Analysis**

The Chi-square test or Fisher exact tests were used to estimate association between categorical variables. Student’s t test was used to compare means and z criteria was used to test the difference in two population proportions. Data analysis performed using SPSS 20.0. P-values less than 0.05 were interpreted as statistically significant.

**Results**

The global PSQI mean score, reflecting overall sleep quality, was significantly higher in females (9.95), as compared to males (5.63) (Table 1). Global PSQI score among Lithuanian Maritime Academy students was significantly lower (5.59), as compared to the students of Health Sciences (7.22), p<0.001.
Depression mean score was significantly higher among the students older than 22 years, as compared to 18-19 year old students, respectively 4.53 vs 3.49, p<0.001. Third year students had higher depression score, as compared to first year, 4.39 vs 3.69, p<0.05. Anxiety score was significantly higher among female students (8.51), as compared to male (7.36) (Table 1). Anxiety was higher (8.94) among the students older than 22 years, as compared to 18-19 years old ones (7.17), p<0.001, also among third year students (9.17), as compared to the first one (7.25). The students of Lithuanian Maritime Academy had significantly lower anxiety score, as compared to the students of Health Sciences, 7.45 vs 8.63, p<0.001.

### Table 1
Comparing sleep quality, depression and anxiety mean scores, according to the students' gender, age, year of studying and institution

<table>
<thead>
<tr>
<th>Variables</th>
<th>Global PSQI Score Mean (SD)</th>
<th>Depression Score Mean (SD)</th>
<th>Anxiety Score Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>5.63 (2.723)</td>
<td>4.08 (2.867)</td>
<td>7.36 (4.710)</td>
</tr>
<tr>
<td>Female</td>
<td>9.95 (2.993) **</td>
<td>3.99 (2.833)</td>
<td>8.51 (4.025) **</td>
</tr>
<tr>
<td><strong>Age groups</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-19</td>
<td>6.32 (2.756)</td>
<td>3.49 (2.510)</td>
<td>7.17 (3.738)</td>
</tr>
<tr>
<td>20</td>
<td>6.33 (2.944)</td>
<td>3.85 (2.779)</td>
<td>7.55 (4.110)</td>
</tr>
<tr>
<td>21</td>
<td>6.54 (3.273)</td>
<td>4.33 (3.019)*</td>
<td>8.67 (4.892)*</td>
</tr>
<tr>
<td>≥22</td>
<td>6.46 (2.816)</td>
<td>4.53 (2.980)**</td>
<td>8.94 (4.377)**</td>
</tr>
<tr>
<td><strong>Year of studying</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>6.36 (2.840)</td>
<td>3.69 (2.676)</td>
<td>7.25 (4.091)</td>
</tr>
<tr>
<td>Second</td>
<td>6.42 (3.095)</td>
<td>4.02 (2.831)</td>
<td>7.85 (3.963)</td>
</tr>
<tr>
<td>Third</td>
<td>6.42 (2.915)</td>
<td>4.39 (2.992)*</td>
<td>9.17 (4.840)**</td>
</tr>
<tr>
<td><strong>Institution</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty of Health Sciences</td>
<td>7.22 (3.004)</td>
<td>4.12 (2.971)</td>
<td>8.63 (4.060)</td>
</tr>
<tr>
<td>Lithuanian Maritime Academy</td>
<td>5.59 (2.673)**</td>
<td>3.93 (2.713)</td>
<td>7.45 (4.558)**</td>
</tr>
</tbody>
</table>

*p<0.05, as compared to the reference group (italic)

** p<0.001, as compared to the reference group (italic)

Sleep quality was compared between the students of two institutions in each of PSQI subscales. The students of the Faculty of Health Sciences had significantly higher PSQI mean, as compared to the students of Lithuanian Maritime Academy in the subscales of Sleep quality (1.20 vs 0.97), Sleep latency (1.62 vs 1.30), Sleep duration (0.60 vs 0.33), Sleep efficiency (1.12 vs 0.72) and Daytime dysfunction (1.28 vs 0.89), p<0.001 (Table 2). The mean score in the subscale Sleep disturbance wasn’t significantly higher among the students of Lithuanian Maritime Academy (1.26), as compared to the Faculty of Health Sciences (1.22), p<0.05.

### Table 2
Comparing means of the PSQI subscales between institutions

<table>
<thead>
<tr>
<th>PSQI subscales</th>
<th><strong>Faculty of Health Sciences</strong> (n=400) Mean; SD</th>
<th><strong>Lithuanian Maritime Academy</strong> (n=393) Mean; SD</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep quality</td>
<td>1.20; 0.644</td>
<td>0.97; 0.686**</td>
<td>0.000</td>
</tr>
<tr>
<td>Sleep latency</td>
<td>1.62; 0.845</td>
<td>1.30; 0.899**</td>
<td>0.000</td>
</tr>
<tr>
<td>Sleep duration</td>
<td>0.60; 0.722</td>
<td>0.33; 0.675**</td>
<td>0.000</td>
</tr>
<tr>
<td>Sleep efficiency</td>
<td>1.12; 1.130</td>
<td>0.72; 1.064**</td>
<td>0.000</td>
</tr>
<tr>
<td>Sleep disturbance</td>
<td>1.22; 0.463</td>
<td>1.26; 0.574</td>
<td>0.010</td>
</tr>
<tr>
<td>Use of sleeping medication</td>
<td>0.23; 0.642</td>
<td>0.15; 0.551</td>
<td>0.124</td>
</tr>
<tr>
<td>Daytime dysfunction</td>
<td>1.28; 0.776</td>
<td>0.89; 0.838**</td>
<td>0.000</td>
</tr>
</tbody>
</table>

*p<0.05, as compared to the reference group (italic)

** p<0.001, as compared to the reference group (italic)
Table 3

<table>
<thead>
<tr>
<th>Institution</th>
<th>Normal sleep n=337</th>
<th>Poor sleep n=456</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>95% CI</td>
<td></td>
</tr>
<tr>
<td>Faculty of Health Sciences</td>
<td>121 (35.9)</td>
<td>30.76 – 41.05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>279 (61.2)</td>
<td>56.70 – 65.67</td>
<td></td>
</tr>
<tr>
<td>Lithuanian Maritime Academy</td>
<td>216 (64.1)</td>
<td>58.95 – 69.24**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>177 (38.8)</td>
<td>34.33 – 43.30**</td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05, as compared to the reference group (italic)

**p<0.001, as compared to the reference group (italic)

Lithuanian Maritime Academy students had significantly lower prevalence of poor sleep, as compared to the students of the Faculty of Health Sciences, 38.8% vs 61.2%, p<0.001 (Table 3).

Discussion

The fact that more than 60% of medical students and more than 30% of maritime students were poor sleepers can be explained by the other study where 314 medical students were questioned (Brick et al., 2010). The authors of this study investigated whether subjective sleep quality was reduced in medical students, and whether demographics and sleep hygiene behaviors were associated with sleep quality. Correlation and regression analyses tested for associations among demographics, sleep hygiene behaviors, and sleep quality. As hypothesized, medical students’ sleep quality was significantly worse than a healthy adult normative sample (t = 5.13, p < .001) (Brick et al., 2010). Studies, where PSQI sleep evaluation method was used, showed that more than 50% of medical students (Yazdi et al., 2016; Machado-Duque et al., 2015; Waqas et al., 2015) and less than 50% of non-medical students were poor sleepers (Choueiry et al., 2016; Quick et al., 2016; Assaad et al., 2014). Sleep problems tend to co-occur with increased mental health issues in university students – the frequency of nighttime sleep disruptions was positively associated with increased report of anxiety and somatic complaints but not depressive problems (Milojevich & Lukowski, 2016), so it is understandable why anxiety was more prevalent among the medical students, comparing to those who study at maritime academy, and depression mean scores were significantly different, but none showing depressive problems. Some other studies showed similar results: 150 first year students were tested (50 of them were medical, 50 – engineering and 50 – art students). Analyzing the effect of professional course choice on the quality of life and mood of first year undergraduate medical, engineering and arts students was found out that a total of 80% of medical students, 72% in engineering and 66% in arts opted for the respective courses as their choice but stress, depression and anxiety was highest among medical students followed by engineering and arts students. Quality of life was reported as either good or very good by majority of students except 16% medical students, 8% engineering and 4% arts students who perceived quality of life as either poor or neither poor nor good (Singh et al., 2016), prevalence of 7.7-65.5% for anxiety, 6.0-66.5% for depression and 12.2-96.7% for psychological distress in medical students population were recorded in various studies (Hope & Henderson, 2014). This wide range of results can be explained by the variable quality of the studies. The variation between results from different studies may be related to differences in cultural habits, socioeconomic status and university characteristics of different countries. Also, if students were questioned during exam periods, the situation with their sleep quality, anxiety and depression could have been worse than normal. There were mostly female students in medical study programmes and mostly male students in maritime academy. This fact can lead to the doubt, that gender can be the reason, why poor sleep and anxiety were more prevalent among medical students compared to maritime students, but there was a research, where 251 medical students were questioned about their sleep quality and 34 stressors and logistic regression analysis showed that cases of high-level stress were associated only with year of study and academic-related stressors, but not with gender. Mean (SD) PSQI score was 8.1 (3.12) and majority of respondents (77.02%) were poor sleepers. The chi-squared test revealed a significant association between stress and poor quality of sleep (chi-squared = 5.48, P < 0.05). The prevalence of poor quality of sleep among stressed students was 82%, whereas among non-stressed students, only
69.8% were poor sleepers. Independent sample T test revealed a significant association in mean scores of PSQI scale and academic stressors. Those students who reported academic stressors as often/always had a higher mean score on PSQI scale than their counterparts who reported academic stressors as never/sometimes (Mean difference = 1, P < .05) (Waqas et al., 2015). Our study showed similar results according to the years of studying – third year students experienced more anxiety than freshmen year students.

All of these studies mentioned had non-representative study samples, so these findings cannot be applied to all the students around the world, but educators should know that medical students are very vulnerable to anxiety and they sleep poorly. Sleep correction lectures could be a step to the better health of students.

Conclusions

1. Health sciences students more frequently, as compared to maritime students, had poor sleep, prolonged sleep latency, shorter sleep duration, decreased sleep efficiency and daytime dysfunction.

2. Depression and anxiety scores were higher in female, older and studying third year students.

References

PRASTAS MIEGAS, NERIMAS IR DEPRESIJA SVEIKATOS IR JŪREIVYSTĖS MOKSLŲ STUDENTŲ TARPE

Šarūnė Barsevičienė, Jurgita Andruškienė, Giedrius Varoneckas

Summary

Apklausos tikslas buvo įvertinti miego kokybę, depresijos ir nerimo pasireiškimą, priklausomai nuo studentų lyties, amžiaus, kurso ir mokslo institucijos. Metodai: tyrimo imtis buvo sudaryta iš 400 (96,8 proc. moterys) Klaipėdos valstybinės kolegijos Sveikatos mokslų fakulteto studentų ir 393 (78,9 proc. vyrai) Lietuvos aukštosios jūreivystės mokyklos studentų, kurių amžius buvo nuo 18 iki 46 metų. Subjektyviam miego kokybės vertinimui buvo naudotas Pitsburgo miego kokybės klausimynas (PSQI), o depresijai ir nerimui nustatyti buvo naudojamas HAD klausimynas. Studentai, kurių Pitsburgo miego kokybės indeksas buvo ≤5, buvo priskiriami gerai miegančių, o >5 – prastai miegančių grupė. HAD klausimyno reikšmės, kur ių reikšmę buvo ≤7, nerodė depresijos ar nerimo pasireiškimo, o reikšmės, kurios buvo >7, rodė depresijos ar nerimo pasireiškimą. Rezultatai: beveik dvigubai daugiau sveikatos mokslų fakulteto studentų skundėsi prastu miegu (61,2 proc.) nei jūreivystės studentų (38,8 proc.), p<0.001. Jūreivystės mokyklos studentai turėjo statistiškai reikšmingai žemesnį nerimo pasireiškimo vidurkį (7.45), lyginant su sveikatos mokslų fakulteto studentais (8.63), p<0.001. Taip pat didesni nerimo vidurkiai buvo 22 metų ir vyresnių studentų (8.94), nei tų, kuriems 18-19 metų (7.17) ir trečiakursių (9.17), lyginant su pirmakursiais (7.25), p<0.001. Depresijos pasireiškimo vidurkiai statistiškai reikšmingai skiriasi tarp skirtingų mokymo įstaigų studentų, bet jie visi yra mažesni nei 7, todėl nerodo depresijos pasireiškimo. Įtakos: sveikatos mokslų fakulteto studentai dažniau skundėsi prastu miegu ir nerimu nei jūreivystės studentai. Nerimo ir depresijos pasireiškimo vidurkiai didesni moteriškos lyties, vyresnio amžiaus ir vyresniame kurse studijuojančių studentų. RAKTINIAI ŽODŽIAI: blogas miegas, depresija, nerimas, studentai, sveikatos mokslai, jūreivystė.