

Omid Rezaei¹ / Yaser Mokhayeri² / Javad Haroni³ / Mahdi Jamshidi Rastani⁴ /
Mohammad Sayadnasiri⁵ / Hessem Ghisvand⁶ / Mehdi Noroozi⁶ / Bahram Armoon⁷

Association between sleep quality and quality of life among students: a cross sectional study

¹ Psychosis Research Center, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

² School of Public Health, Lorestan University of Medical Sciences, Khorramabad, Iran

³ Social Determinants of Health Research Center, Yasuj University of Medical Sciences, Yasuj, Iran

⁴ Occupational Health Engineering Department, Students' Research Office, School of Public Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran

⁵ Psychosis Research Center, Department of Psychiatry, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

⁶ Social Determinants of Health Research Center, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

⁷ Infertility and Reproductive Health Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran, Phone/Fax: +982122432040-41, E-mail: bahramarmun@gmail.com

Abstract:

Background: Lack of sleep and on going sleep disorder can affect family health and interpersonal relationships.

Objective: The aim of study was to investigate the association between sleep quality and the probable determinants of quality of life among students of a public health faculty at Shahid Beheshti University of Medical Sciences (SBMU) in the 2015 academic year.

Methods: The data from a cross-sectional study of 275 students that randomly stratified sampling between different classes of college students of a public health faculty of Shahid Beheshti University of Medical Sciences were used in this study. The data were collected using a structured questionnaire consisted of modules on socio-demographic characteristics, the Petersburg Standardized Sleep Quality Questionnaire(PSQL) and the World Health Organization Quality of Life Questionnaire (WHOQOL-BREF). Data analysis was done with descriptive and logistic regression. All analyses were carried out using SPSS software V.19.

Results: A total of 275 students participated in this study. The mean age \pm standard deviation (SD) was 22.1 ± 3.6 years. In the univariable model, students that were living in their own homes had the odds of 2.18 times more than the others to have a higher quality of life level [95% confidence interval (CI): 1.07–4.45]. Moreover, sleep disorder was negatively associated with the quality of life [odds ratio (OR) = 0.23; 95% CI: 0.12–0.46].

Conclusion: These results will help university administrators and policy makers to identify factors associated with poor sleep and provide approaches to enhance sleep hygiene and relevant knowledge in university students. Living in a dormitory while also suffering from sleep problems could significantly reduce the quality of life.

Keywords: quality of life, sleep quality, students

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Introduction

Sleeping is one of the key health determinants just like nutrition and physical activity [1] and about one-third of our lives is spent in sleeping [2]. Sleep can be defined as an active, recursive and repetitive mode and disconnection from the physical environment [3]. Experimental evidence shows that there is a relationship between sleep and cognitive functions, reasoning, directing behavioral objects and creative processes [4]. Enough sleep is important for fighting infections, metabolism, prevention of diabetes and effective functioning. Moreover, sleep time and period affect the functioning of metabolic and neuro endocrines [5]. Sleep disorders and short sleep, develop heart diseases, hypertension, obesity and diabetes [6], [7]. Short sleep is defined less than 6 h per day sleeping [5], [8]. In addition, sleep disorders can significantly affect multiple aspects of quality of life such as general health, physical functioning, cognitive and psychological effects and disrupts daily activities [2], [9]. There are multiple views about the definition of quality of life, and it is related to a positive value of happiness, success, wealth, health and satisfaction of life [10] and consists of many dimensions of physical and

Bahram Armoon is the corresponding author.

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mental health, financial situations, personal beliefs, interaction with environment and personal functionality [11]. Studies have shown, about 15%–35% of adult populations complain of sleep disorders and have problems with sleeping and its duration [12]. A study in 2003 on more than one million men and women demonstrated that there is 15% more death risk for people who sleep more than 5.8 h or less than 5.3 per day [13]. About one-third of the adult population suffer from sleep and wake up disorders and 5% of community members suffer from daily napping [14]. Living in a student dormitory could impact on sleep quality among students [15], [16]. College students due to academic requirements, are under intense pressure, that might result in sleep disorders [17]. Studies have indicated that there is a statistically significant relationship between times of sleeping, sleeping disorders, sleep duration and academic performance of students. The better sleep habits, the better are studying functions [18]. In a study conducted on medical students in Brazil, 3.42% of students reported having problems with sleeping [19]. The results of another research in the Hamedan province of Iran showed that 48% of students had sleep disorders [20]. Therefore, there is a major impact of sleep quality on college students' functionality and possible relation to quality of life, there is also a lack of enough information about this issue among college students. So, the aim of this study was to investigate the association between sleep quality and the probable determinants of quality of life among students of a public health faculty at Shahid Beheshti University of Medical Sciences (SBMU) in the 2015 academic year.

Materials and methods

This research was a descriptive and analytical study, which was conducted on college students of a public health faculty of Shahid Beheshti University of Medical Sciences (SBMU) in the 2015 academic year. Ethical approval was obtained from the Ethics Committee of the Shahid Beheshti University of Medical Sciences IRB (No. 166-10/12/93). The questionnaires were completed by 275 students. Random stratified sampling between different classes of a public health faculty was used. The sampling was accomplished in three steps; firstly, the register of students was prepared by year of their entrance to the university. Second, considering the sex ratio and the entrance year of the students, several classes using random sampling were selected. As the third step, according to the register of students, a few in each class were sampled. According to a literature review [21], the sample size was calculated to be 275 ($\alpha = 0.05$, $d = 0.02$). We also anticipated a 10% attrition rate. Three questionnaires were used. The questionnaires consisted of demographic questions including (age, sex, education level, occupation, current housing status and marital status), the Petersburg Standardized Sleep Quality Questionnaire and the World Health Organization Quality of Life Questionnaire (WHOQOL-BREF), that was designed for the evaluation of the quality of life. Ghoreishi et al. [21] in an investigation of the sleep quality among Zanjan students demonstrated Cronbach's $\alpha = 0/83$ for Petersburg Standardized Sleep Quality Questionnaire and Soltani et al. [22] in assessing quality of life of Gilan University students, indicated that Cronbach's α was 0/87 the WHOQOL-BREF. The short form of this questionnaire (WHOQOL-BREF), which contains 26 questions which evaluates four domains: physical health, mental health, social relationships and environmental health. In scoring the sleep quality questionnaire, seven components were checked. The minimum and maximum scores for each component were considered from 0 (no difficulty) to 3 (very serious problem). Finally, scores of each component were summed together and resulted in a general score (from 0 to 21). To tabulate the demographic variables, descriptive statistics (frequency distribution) were used. Additionally, the logistic regression to find the association between demographic characteristics with the quality of life was run. All analyses were carried out with SPSS software V.19. IBM (International Business Machines Corporation, NY, USA).

Results

In this study, 275 samples of college students were considered. Demographic characteristics are presented in Table 1. Samples comprised of 87 men (32%) and 188 women (68%). The mean age \pm standard deviation (SD) was (22.1 ± 0.6) . The majority (81%) of students were undergraduates and had mean sleep quality \pm SD (2.6 ± 0.46) . Ninety percent of participants were employed and about half of them were living in dormitories. Descriptive characteristics of covariates, stratified by the quality of life, are tabulated in Table 1. Analysis of variance (ANOVA) and the chi-square test were used for continuous and categorical variables, respectively. According to the results, except for current housing and sleep problems, none of the differences were statistically significant. The results of the logistic regression are tabulated in Table 2. As shown most of the demographic variables were not significantly associated with quality of life. In fact, only current housing and the sleep problems had a significant association with quality of life. In the univariable model, the students that were living in their own homes had the odds of 2.18 times more than the others of having a higher quality of life level (95% CI: 1.07–4.45).

Moreover, sleep disorder was negatively associated with the quality of life (OR = 0.23; 95% CI: 0.12–0.46). Even after adjusting for other covariates – in the multivariable model – both current housing and sleep problems were associated with quality of life.

Table 1: Demographic variables and different grades of quality of life.^a

Covariate	Quality of life		p-Value
	Low and moderate (n=44)	High (n=231)	
Age, year, mean (SD)	22.86 (0.59)	22.17 (0.23)	0.25
Sex			0.74
Male, n (%)	13 (14.94)	74 (85.06)	
Female, n (%)	31 (16.49)	157 (83.51)	
Education			0.67
Bachelor, n (%)	35 (15.56)	190 (84.44)	
Master's of science and upper, n (%)	9 (18)	41 (82)	
Occupation			1
Unemployed, n (%)	40 (16)	210 (84)	
Employed, n (%)	4 (16)	21 (84)	
Current housing status			0.02
Dormitory, n (%)	32 (20.13)	127 (79.87)	
Home with family, n (%)	12 (10.34)	104 (89.66)	
Marital status			0.88
Single, n (%)	39 (16.12)	203 (83.88)	
Married, n (%)	5 (15.15)	28 (84.85)	
Sleep problem			<0.001
Low and moderate, n (%)	19 (9.74)	176 (90.26)	
Severe, n (%)	25 (31.25)	55 (68.75)	

^an, 275.

Table 2: Logistic regression model for the association of demographic characteristics with quality of life.^a

Covariate	Univariable model		Multivariable-adjusted model	
	OR (95% CI)	p-Value	OR (95% CI)	p-Value
Age groups				
<20	1	–	1	–
20–25	0.87 (0.41–1.83)	0.72	1.17 (.052–2.64)	0.69
>25	0.52 (0.21–1.29)	0.16	0.36 (0.07–1.81)	0.29
Sex	0.88 (0.43–1.79)	0.74	0.93 (0.34–2.50)	0.89
Weight	1.00 (0.97–1.03)	0.61	1.01 (0.97–1.05)	0.47
Height	0.99 (0.97–1.01)	0.74	1.00 (0.96–1.03)	0.97
Marital status	1.07 (0.39–2.95)	0.88	1.11 (0.33–3.67)	0.86
Housing	2.18 (1.07–4.45)	0.03	2.25 (1.00–5.03)	0.04
Disease	2.64 (0.94–7.39)	0.06	2.05 (0.62–6.75)	0.23
Sleep problem	0.23 (0.12–0.46)	<0.001	0.22 (0.10–0.45)	<0.001
Occupation	1.00 (0.32–3.06)	0.98	1.11 (0.29–4.27)	0.87
Education	0.83 (0.37–1.87)	0.67	1.71 (0.37–7.95)	0.48

^an, 275.

Discussion

This study aimed to determine the association between sleep quality and quality of life in college students of SBMU in the 2015 academic year. Sleeping is one of the essential parts of health and could have an influence on the physical and psychological well-being [23]. The results indicate that almost all of the students had sleep problems. In fact, 55% of the participants had severe and 25% had low and moderate sleep problems and there were no significant differences between males and females for this problem ($p < 0.05$), but Tsai and Li [24]

reported that females had a lower quality of sleep in comparison with males. In a study that was conducted by Lund et al. 2010, 60% of students had sleep problems with the poor sleep quality in accordance with the PSQL classification [25]. Our findings show that having a history of sleep problem is negatively associated with quality of life so that the sleep problem caused a decrease in quality of life. Moreover, they concluded that the students with low quality of sleep had significantly more physical and psychological problems in comparison with others [25]. Among demographic variables, only the habitat status, and the sleep disorder were associated with quality of life. The students living in their own homes had the odds of 2.25 times more than the others to have a higher quality of life level (95% CI: 1.00–5.03). In the current study, the sleep disorder had a significant association with quality of life and a negative impact on it and could decrease the quality of life level (OR = 0.22; 95% CI: 1.07–4.45). It seems possible that it can be inferred from these results that the sleep disorders can be caused by the lifestyle of students. Also the insufficient surveillance of and the easier accessibility to medications for control sleeping could result in decreasing the sleep quality of the students in the dormitories [10], [24]. Regestein et al. [26] indicated that the female students who had self-reported sleep problems had significantly reported symptoms of depression. In addition, Taylor reported a significant association between gender and quality of sleep [27]. Another important finding was that the prevalence of sleep disorders among students is a warning issue because it has a significant impact on the quality of life of the population. This finding is in agreement with several studies that reported the significant association between reducing social performance, physical and social health and quality of life [28], [29]. A possible explanation for this might be that coffee consumption and using electronic devices late at night are the reasons of the delay in students sleeping [29]. Stress is one of the important predictors of quality of life of adolescents [30]. Student lifestyle is one of the important factors that affect the occurrence of sleep problems, also the physiological changes associated with adolescence is another factor that influences sleep problems in students [1]. Often the students do not have the skills to cope with stress, which could them cause the anxiety and sleep disorder in them [31]. In accordance with the results, informing the students about the consequences of sleep disorders and focusing on the effective interventions to improve the sleep quality of students is suggested and it is recommended to implement the intervention programs with the purpose of improving the sleep quality of students. One of the limitations of this study was the population investigated in the sampling, they were from the specific location of the university so the research was not generalizable to the other parts of the country. Another limitation was that the study was a cross sectional research. Random satisfied sampling can be mentioned as the strength points of the study. Also implementation of regression model to determine the association between demographic characteristics and sleep quality is another strength of our research.

Conclusion

These results will help university administrators and policy makers to identify factors associated with poor sleep and provide approaches to enhance sleep hygiene and relevant knowledge in university students. Living in dormitories, and suffering sleep problems could significantly reduce the quality of life.

Compliance with ethical standards

Ethical approval was obtained by the Ethics Committee of the Shahid Beheshti University of Medical Sciences IRB (No. 166-10/12/93).

Authors' Statement of Conflict of Interest and Adherence to Ethical Standards

Authors Rezaei, Mokhayeri, Haroni, Noroozi and Armoon declare that they have no conflict of interest. All procedures, including the informed consent process, were conducted in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000.

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Authors contributions: Study design: OR and BA. Data synthesis: JH and YM. Drafting the manuscript: MN and FF. Critical revision of the manuscript: BA.

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