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ORIGINAL ARTICLE

Effects of Sleep Quality on Cardiovascular System, Anxiety, And Academic Performance in Medical and Dental Students in Peshawar, Pakistan

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ABSTRACT

Background: Sleep disturbance is an important issue among medical students and high stress including the pressure of maintaining grades might affect the quality of sleep among students.

Objective: To determine the effects of sleep quality on medical and dental students' cardiovascular system, academic performance, and anxiety at Peshawar Medical and Dental College.

Methodology: The Riphah International University and Prime Foundation Pakistan Institutional Review Board approved a cross-sectional research for their respective institutions. Interrogation of randomly chosen individuals was conducted using the Pittsburgh Sleep Quality Index (PSQI), as well as physiological data. The data were entered and analyzed using SPSS-25.

Result: In our research, out of 600 individuals, 286 (46.7%) had excellent sleep quality (PSQI score less than 5) and 314 (52.3%) had poor sleep quality (PSQI score larger than 5). (PSQI score greater than 5). Among medical students, there was a statistically significant link between sleep quality and physiologic parameters, academic performance, and anxiety score; heart rate (p0.05), systolic blood pressure (p0.05), diastolic blood pressure (p0.01), and academic performance (p0.05) were all linked.

Conclusion: Academic performance, heart rate, and blood pressure were shown to be significantly correlated with sleep quality in dentistry and medical students; however sleep quality was not found to be significantly correlated with anxiety scores.

Keywords: Effects, Sleep Quality, Cardiovascular System, Anxiety, Academic Performance

INTRODUCTION

There are several health and cognitive benefits to getting enough sleep each night. Sleep quality, stress, and academic accomplishment are not studied in depth. For further information, please see the paper by Alotaibi & colleagues (2020) [1]. US medical students are under a lot of pressure, which might damage their academic performance [2]. According to the Pittsburgh sleep quality index (PSQI), medical students in the United States have poor sleep habits .[3] Anxiety, depression, and weariness were all symptoms of medical students' sleep problems in Brazil [4]. According to a 2012 study by Ahberg K et al., medical students should get adequate sleep to learn and remember difficult knowledge. Academic accomplishment is linked to sleep quality, according to Ahrberg and colleagues (2012) and Curcio et al. (2006) [5, 6]. Academic failure and learning impairment are both exacerbated by sleep deprivation and excessive daytime fatigue. members of the research team led by Curcio (2006) [5]. Several new research from China and Portugal have shown that sleep deprivation harms the cardiovascular system, causing high blood pressure in both adults and children [7, 8]. Students in the medical and dental professions are more likely to suffer from sleep disorders because of their rigorous academic and work commitments. Medical and dentistry students may benefit from this study's results regarding their sleep quality and related difficulties. The quality of a student's sleep may have an impact on their ability to do well in school, according to this research.

METHODOLOGY

A cross-sectional research was authorized by Riphah International University's BASR and Prime Foundation Pakistan's IRB. Individuals were recruited using the Pittsburgh Sleep Quality Index (PSQI) and the Hamilton Anxiety Rating Scale (HAMRS) (HAM-A). A PSQI score of 5 or less was regarded excellent, while a score of 5 or more was deemed unacceptable. Academic performance of study participants was classified as follows: 90 percent -99 percent as A-one, 80 percent -89 percent as A-one, 70 percent -79 percent as A-Grade, 60 percent -69 percent as B-Grade, and less than 60 percent or fail in tests. 0-16 indicates no anxiety, 17-17 indicates mild anxiety, 18-24 indicates mild to moderate anxiety, and 25-30 indicates severe anxiety. SPSS 25 was used to input and analyze data, and chi-square was used to examine category variables. When data is not normally distributed, the Chi-square test is utilized. Continuous data makes use of descriptive statistics such as mean, median, standard deviation, and standard error. Mann-Whitney U-check (non- parametric) The U test looked at sleep patterns, academic performance, anxiety, and cardiovascular risk factors. The significance level was set at p=0.05.

RESULT

Out of 600 research participants, 173 (28% of the total) were BDS students, while 427 (71.2 percent) were MBBS students. Of these, 196 (32.7 percent) were above the age of 21, with 381 (63.5 percent) being female and 219 (36.5 percent) being male (see Table 1). There were 591 people in the middle class and 365 people in the joint family system, 98.5 percent of the population. Almost three-quarters of the students were day students. According to our research, 286 (47.7%) of the individuals had a PSQI score less than 5 and 314 (52.3%) had a PSQI score more than 5. (PSQI score greater than 5). Quality of sleep was linked to physiologic parameters, academic performance, but not anxiety score among medical students; heart rate (p0.05), systolic blood pressure (p0.05), diastolic blood pressure (p0.01), and academic performance (p0.05) were all statistically significant.

Table 1: demographic variables

Variable		Frequency (n)	Percentage (%)
PMC and PDC	BDS	173	28.8%
	MBBS	427	71.2%
Gender	Female	381	63.5%
	Male	219	36.5%
Age	19 years	30	5%
	20 years	111	18.5%
	21 years	196	32.7%
	22 years	82	13.7%
	23 years	85	14.2%
	24 years	70	11.7%
	25 years	26	4.3%

Socio-economic status	High	9	1.5%
	Middle	591	98.5%
	Joint	365	60.8%
	Nuclear	235	39.24%

Table 2: Frequency of quality of sleep

Quality of Sleep	Frequency (n)	Percentage (%)
Good Sleep	286	47.7%
Poor Sleep	314	52.3%
Total	600	100%

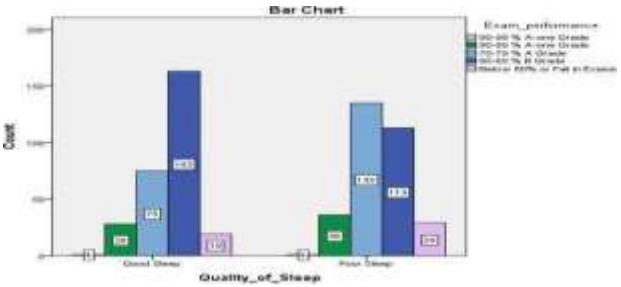

Figure 1: Association between quality of sleep and academic performance

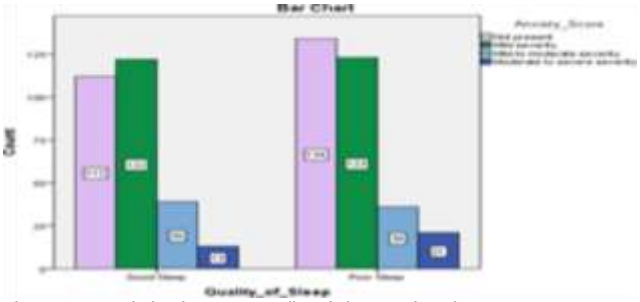

Figure 2: Association between quality of sleep and anxiety

Table 3: Association between quality of sleep and Heart rate, blood pressure (systolic and diastolic)

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Sig.
						Lower Bound	Upper Bound	
Heart rate	Good Sleep	286	75.7622	6.27046	.37078	75.0324	76.4921	0.000002
	Poor Sleep	314	78.2102	6.30384	.35575	77.5102	78.9101	
	Total	600	77.0433	6.40076	.26131	76.5301	77.5565	
Systolic BP	Good Sleep	286	122.2238	7.88640	.46633	121.3059	123.1417	0.000004
	Poor Sleep	314	125.4873	9.19168	.51872	124.4666	126.5079	
	Total	600	123.9317	8.74077	.35684	123.2309	124.6325	
Diastolic BP	Good Sleep	286	81.6224	6.81464	.40296	80.8292	82.4155	0.000371
	Poor Sleep	314	83.8025	7.98356	.45054	82.9161	84.6890	
	Total	600	82.7633	7.52252	.30711	82.1602	83.3665	

DISCUSSION

47.7 percent of 600 study participants reported great sleep quality (PSQI 5), whereas 52.3 percent reported poor sleep quality (PSQI 5). Medeiros ELD et al. observed in 2011 that 38.9% of medical students had inadequate PSQI scores [9]. According to Elagra et al. (2016), 72.5 percent of dentistry students slept badly (PSQI scale showing greater than 5 scores) [10]. In this study, sleep quality was associated to academic success among medical and dental students. Good sleepers outperformed lousy sleepers. Statistically significant (P=0.008). Poor sleep quality has been linked to poor academic performance all around the globe [6, 10]. Maheswari et al. examined data from 512 students at a medical university in Karachi, Pakistan, and discovered that poor sleepers had a lower mean GPA (P001) [11]. Marwa I Elagra et al. discovered that dental students who slept insufficiently performed poorly academically, particularly during clinical years [10]. Sleep quality and anxiety were not associated in our study. (P=0.445) Ibrahim NK et al. found no relationship between sleep quality and anxiety level (p=0.18) [12]. Ozlem Orsal et al. (2017) discovered a positive link between anxiety and sleep quality (p=0.000) [13]. We identified a significant link between sleep quality and heart rate (P=0.002), systolic blood pressure (P=0.004), and diastolic blood pressure (P=0.003) in this study. In 2007, Ben-Dov and colleagues discovered a relationship between sleep deprivation and hypertension [14]. According to Jean-LouisPepin (2014), poor sleep quality/inadequate sleep may raise the risk of hypertension [15].

CONCLUSION

In medical and dental students, there was a significant association found between the quality of sleep with academic performance, heart rate and blood pressure, whereas there was no significant association between quality of sleep and anxiety score.

REFERENCES

1. Alotaibi AD, Alosaimi FM, Alajlan AA, Abdulrahman KAB. The relationship between sleep quality, stress, and academic performance among medical students. J Family Community Med. 2020;27(1):23.
2. Buboltz Jr WC, Brown F, Soper B. Sleep habits and patterns of college students: a preliminary study. J Am Coll Health. 2001;50(3):131-5.
3. Choueiry N, Salamoun T, Jabbour H, El Osta N, Hajj A, Rabbaa Khabbaz L. Insomnia and relationship with anxiety in university students: a cross-sectional designed study. PLoS One. 2016;11(2):e0149643.
4. Costa EF, Santos SA, Santos AT, Melo EV, Andrade TM. Burnout Syndrome and associated factors among medical students: a cross-sectional study. Clinics (Sao Paulo). 2012;67(6):573-80.doi:10.6061/clinics/2012(06)05.
5. Curcio G, Ferrara M, De Gennaro L. Sleep loss, learning capacity and academic performance. Sleep Med Rev. 2006;10(5):323-37.
6. Ahrberg K, Dresler M, Niedermaier S, Steiger A, Genzel L. The interaction between sleep quality and academic performance. J Psychiatr Res. 2012;46(12):1618-22.
7. Jackowska M, Dockray S, Endrighi R, Hendrickx H, Steptoe A. Sleep problems and heart rate variability over the working day. J Sleep Res. 2012;21(4):434-40.
8. Paciência I, Araújo J, Ramos E. Sleep duration and blood pressure: a longitudinal analysis from early to late adolescence. J Sleep Res. 2016;25(6):702-8.
9. Medeiros ALD, Mendes DB, Lima PF, Araujo JF. The relationships between sleep-wake cycle and academic performance in medical students. Biol Rhythm Res. 2001;32(2):263-70.
10. Elagra MI, Rayyan MR, Alnemer OA, Alshehri MS, Alsaffar NS, Al-Habib RS, et al. Sleep quality among dental students and its association with academic performance. Journal of International Society of Preventive & Community Dentistry. 2016;6(4):296.
11. Maheshwari G, Shaukat F. Impact of poor sleep quality on the academic performance of medical students. Cureus. 2019;11(4).
12. Ibrahim NK, Baharoon BS, Banjar WF, Jar AA, Ashor RM, Aman AA, et al. Mobile phone addiction and its relationship to sleep quality and academic achievement of medical students at King Abdulaziz University, Jeddah, Saudi Arabia. Journal of research in health sciences. 2018;18(3):e00420.
13. Orsal O, Orsal O, Alparslan GB, Unsal A. Evaluation of the relation between quality of sleep and anxiety among university students. HealthMED. 2012;6(7):2244-55.
14. Ben-Dov IZ, Kark JD, Ben-Ishay D, Mekler J, Ben-Arie L, Bursztyn M. Predictors of all-cause mortality in clinical ambulatory monitoring: unique aspects of blood pressure during sleep. Hypertension. 2007;49(6):1235-41.
15. Pepin J-L, Borel A-L, Tamisier R, Baguet J-P, Levy P, Dauvilliers Y. Hypertension and sleep: overview of a tight relationship. Sleep Med Rev. 2014;18(6):509-19.