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Sleep Quality and Its Possible Predictors Among University Students of Islamabad, Pakistan

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ABSTRACT

***Objective*:** To assess sleep quality among Islamabad university students and find predictors of poor sleep quality.
***Study Design*:** Cross-sectional analytic study
***Place and Duration of Study*:** Capital University of Science and Technology ,Islamabad Pakistan, from Feb to Jun 2019
***Methodology*:** The study population (n=397) was undergraduate students from all eight semesters of four faculties. The dependent variable sleep quality was measured through a standard validated tool, Pittsburgh Sleep Quality Index (PSQI).
***Results*:** Out of 397 participants, 158(40%) were hostelities and 239(60%) were day scholars. There were 134(33.5%) students having a good sleep, and 263(66.5%) were having a bad sleep, according to PSQI scores obtained. Association analysis showed a statistically significant association between sleep quality and heavy meals, gadget use, drinking beverages before bedtime, sleeping in a noisy room, and type of residence ($p \leq 0.001$). Study findings showed gadget use before bedtime (AOR=4.472, 95% CI=2.674-7.478), residence type (AOR=2.323,95% CI=1.4-3.855), sleeping in a noisy room (AOR=2.241,95% CI=1.369-3.665) and heavy meal before bedtime (AOR=1.985,95% CL=1.142-3.451) were significant predictors of poor sleep quality.
***Conclusion*:** It was concluded that two out of three students need better sleep quality. Universities should give preparatory assistance for developing and executing health promotion and educational curricula.

Keywords: Pittsburgh Sleep Quality Index, Sleep environment, Sleep quality, University students.

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INTRODUCTION

Sleep deprivation can result in impaired concentration and memory, as well as delayed reflexes.[1,2] The Pittsburgh Sleep Quality Index is the most extensively used metric.[3] Insomnia is an idiosyncratic disturbance of sleep quantity or quality that affects most people worldwide.[4] Disorder in the 24-hour sleep–wake cycle is one probable pathological mechanism. Circadian rhythm abnormalities in young adults have been well documented, as the natural sleep cycle is shifting due to the demands of a service-based economy and modern lifestyle.[5,6]

Undergraduate students' life patterns transform dramatically due to their university education. Increasing academic obligations, higher liberation, changes in peer clusters, an innovative social life, increased academic tasks, anxieties regarding the future and a continual burden to do well are all student challenges.[7,8] Particularly, sleep disorders are increasing among university students as they encounter numerous stressors that change the quality of their sleep.[9] Evidence from earlier studies indicates the interaction between poor sleep quality and screen addiction.[10]

Many studies have been conducted on sleep quality among university students; most of them were conducted in the United States, some in European nations, and some studies in Asian countries. Most of them are conducted on medical students. Studies on sleep quality and factors affecting sleep quality are comparatively new in Pakistan. A diverse culture country like Pakistan is the appropriate setting for enfolding different new concepts of sleep quality-related factors among university students. Through these features in the context, the current study aims to assess the sleep quality of university students in Islamabad and to examine how well the sleep quality of university students are associated with the various demographic factors and lifestyle of students.

METHODOLOGY

The cross-sectional study was performed from February to June 2019 at Capital University of Science and Technology, Islamabad. Presently, CUST has four Faculties: The faculty of Engineering, the Faculty of Computing, the Faculty of Health & Life Sciences and the Faculty of Management and Social Sciences. The research was approved by the Ethical Committee of AL-Shifa Trust Eye Hospital (Reference No: ERC-09/AST-21).The sample size was computed using prevalence= 49.5%.[11]

Inclusion Criteria: Undergraduate students of either gender, aged 18 to 22 years, from all eight semesters of

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four faculties, either day scholars and hostelite were included. This study only included the students that were not doing any part-time or full-time jobs, and their marital status was single.

Exclusion Criteria:All medical university students were excluded. Any student suffering from a chronic medical condition, both physical and mental and was also on medication was excluded from the study. Any student who was ill for the last seven days was also excluded from the study because any chronic and acute illness disturbs the normal sleep cycle.

Simple random sampling using the lottery method was used to select the University from 20 HEC-recognized universities in ICT. One private University of Islamabad named CUST (Capital University of science and technology) appeared in the lottery. The total sample was divided into proportionate samples according to gender. University administration obtained the exact division of the female-male ratio of undergrad students. The total number of undergrad students was 2894; boys: 1870 (approximately 64%); girls: 1024 (approximately 36%)**.**According to the male-female ratio of university undergrad students, the final sample size was 256 boys and 144 girls.

The data collection tool/questionnaire was divided into three sections. Section one included demographic information, section two consisted of information on lifestyle factors of the students such as eating habits, hobbies, physical or sports activities, heavy dinner, daytime nap, coffee/tea intake, and gadget use. Section three was to assess the dependent variable of the study, sleep quality which was measured through a standard validated tool, the Pittsburgh Sleep Quality Index (PSQI). Pittsburgh Sleep Quality Index (PSQI) has Cronbach's α=0.83.[12] Prior to data collection, mandatory permission was obtained from the university authority to collect data from students only from the outside area of the University, such as cafeteria 1(near the parking lot), cafeteria 2(river view), main entrance waiting area of the university and parking lot. Therefore, a consecutive sampling technique was used for data collection.

Data were analysed into Statistical Package for the social sciences (SPSS) version 22:00. Quantitative variables were expressed as mean±SD and qualitative variables were expressed as frequency and percentages. In addition, this study applied a chi-square test to analyse the association between sleep quality and demographic and lifestyle factors. Finally, binary logistic regression analysis was used to find predictor factors for poor sleep quality. The p-value of ≤0.05 was considered statistically significant.

RESULTS

The final 397 out of 420 respondents whose responses were considered for inclusion in the analysis of this study because 23 needed to be considered due to a lot of missing items value. Out of 397 participants 139(35%) were female and 258(65%) were male and comprised of 158(40%) hostelized and 239(60%)day scholars. The majority of students, 142(36%), were in the first year of their study. There were 76(19%) smokers and 98(24%) students were 20 years old.

There were 178(45%) students who sometimes took a nap during the day and 190(48%) students who sometimes smoked before bedtime. Whereas 139(35%) students ate heavy meals frequently before bedtime, 151(38%) students sometimes took beverages containing caffeine before bedtime. Students who brought worries sometimes when going to bed were 128(32.2 %),131(33%) students used to take a glass of milk before bedtime, and the same percentage never took milk before sleep. The frequency distribution of items of life style factors amongst respondents were showed in Figure-1.

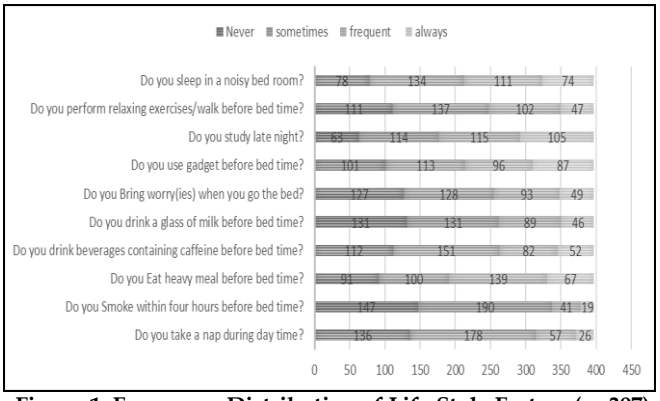

Figure-1: Frequency Distribution of Life Style Factors (n=397)

In addition, 113(28.5%) students sometimes use gadgets before bedtime. However, 115(29%)frequently studied late at night,137(35%) students performed/walked/relaxing exercises sometimes, and 134 (34%) students reported sleeping in a noisy bedroom sometimes. According to PSQI scores obtained, Figure-2 explained that 134(33.5%) students had a good sleep, and 263(66.5%) were bad sleep.

Association analysis for demographic variables and sleep quality showed an association between type of residence and sleep quality ($p \leq 0.001$). No statistical difference in sleep quality was observed according to

smoking, drinking milk, bringing worries, exercising before bedtime and daytime naps (p>0.05 for all). Table-I showed a statistically significant association between sleep quality and heavy meals, gadget use, drinking beverages before bedtime and sleeping in a noisy room (p ≤0.001).

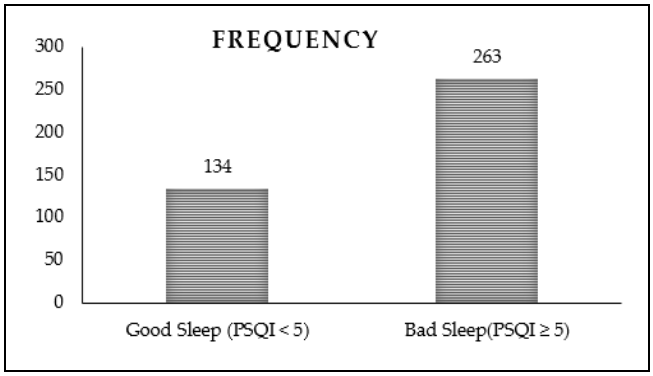

Figure-2 Frequency Distribution of PSQI Scores (n=397)

Table-I: Life Style Factors Associated with Sleep Quality (n=397)

Life Style Factors	Never n(%)	Sometimes n(%)	Frequent n(%)	Always n(%)	*p*-value
Heavy Meal Before Bed Time					
Bad sleep	43(16.30)	57(21.70)	105(39.90)	58(22.10)	0.001
Good sleep	48(35.80)	43(32.10)	34(25.40)	9(6.70)	
Beverages Containing Caffeine Before Bed Time					
Bad sleep	58(22.10%)	95(36.10%)	68(25.90%)	42(16%)	0.001
Good sleep	54(40.30%)	56(41.80%)	14(10.40%)	10(7.50%)	
Gadget use Before Bed Time					
Bad sleep	41(15.60%)	67(25.50%)	83(31.60%)	72(27.40%)	0.001
Good sleep	60(44.80%)	46(34.30%)	13(9.70%)	15(11.20%)	
Sleep in a Noisy Bed Room					
Bad Sleep	40(15.20%)	78(29.70%)	87(33.10%)	58(22.10%)	0.001
Good sleep	38(15.20%)	56(29.70%)	24(33.10%)	16(22.10%)	

Before applying Binary logistic regression (to identify the effect of predictors on the dependent variable, sleep quality), four categories of significant independent variables were merged into two categories (seldom and often), shown in Table-II. The risk of having poor sleep quality was four times greater in students using gadgets before bedtime (AOR=4.472, 95% CI=2.674-7.478). Other predictors of poor sleep quality were residence type (AOR=2.323, 95% CI=1.4 - 3.855), sleeping in a noisy room (AOR=2.241, 95% CI=1.369-3.665)and heavy meal before bedtime (AOR= 1.985,95% CL=1.142-3.451).

DISCUSSION

The current study's concluded predictors are a complete endeavour for knowledge of practices that promote sleep quality so that university students can effectively improve their personal sleep quality by addressing sleep-related issues.

Our findings showed that, according to PSQI, 134 (33.5%) students had good sleep, and 263(66.5%) had bad sleep quality among students. Findings are almost similar to another study conducted in two universities in Ethiopia that assessed 55.8% of participants as poor sleepers and 44.2% as good sleepers by global PSQI score.[13] Another study findings showed quite similar results, which were conducted in Pakistan; 124(34%) students were bracketed as good sleepers, whereas 238(66%) fell into the category of poor sleepers.[14]

The results of the current study reflect that there was a strong association between the noise in the external environment, along with residence type and sleep quality of the students; the chi-square value is

Table-II:Predictors of Sleep Quality (PSQI Total scores) (n=397)

Factors	Study Parameter		Univariate Logistic Regression			Multivariate logistic regression		
	Good Sleep	Bad Sleep	*p*-value	Un-adjusted OR	95% CI for UOR	*p*-value	Adjusted OR	95% CI for AOR
Residence								
Day scholars	98(73.1)	141(53.6)	1			1		
Hostelized	36(26.9)	122(46.4)	0.001*	2.355	1.498-3.703	0.001*	2.323	1.400-3.855
Heavy Meal Before Bed Time								
Seldom	91(67.9)	100(38)	1			1		
Often	43(32.1)	163(62)	0.001*	3.45	2.222-5.356	0.015*	1.985	1.142-3.451
Beverages Containing Caffeine Before Bed Time								
Seldom	110(82.1)	153(58.2)	1			1		
Often	24(17.9)	110(41.8)	0.001*	3.295	1.989-5.460	0.087	1.738	0.922-3.277
Gadget use Before Bed Time								
Seldom	106(79.1)	108(41.1)	1			1		
Often	28(20.9)	155(58.9)	0.001*	5.433	3.350-8.811	0.001*	4.472	2.675-7.478
Sleep in a Noisy Room								
Seldom	94(70.1)	118(44.9)	1			1		
Often	40(29.9)	145(55.1)	0.001*	2.888	1.855-4.496	0.001*	2.241	1.370-3.665

23.86 and =14.12 with p- 0.001. This study had 40% (158) hostilities and 60%(239)day scholars out of 397 students. One study conducted at Ghana medical university [15] showed a significant association between sleep quality and living conditions, together with waking up due to noise($p \leq 0.001$) among 104(68%) hostilities and 49(32%) day scholars participants. A previous study carried on in Karnataka, India, also concluded that staying at the hostel disturbs the students' sleep quality due to various reasons such as noise, the uncomfortable temperature of the rooms, and disturbance from other mates and peers.[16]

In this study, using gadgets before bedtime showed a very strong association with sleep quality. Furthermore, a study conducted in China among full-time students of multiple colleges also showed that problematic internet use close to the bed was associated with poor sleep quality.[17] Convergent to the above findings, a study performed in West Bengal.[18] showed a significant association between smartphone addiction and sleep quality (p=0.001).

A study conducted in southwest Ethiopia.[19] showed age (OR=2, 95% CI= 1.1, 3.6) as a strong predictor of poor sleep quality. Similar results were obtained in another study, which explained that age (OR=1.05,95% CL=1.03-1.06) & gender (OR=1.88, CI=1.54-2.28) were risk factors for poor sleep quality.[20]

This study emphasizes that the pivot of future sleep quality upgrading processes should aim at non-pharmacological and health education interventions, such as policies for noise reduction, increased single-student rooms and awareness about the hazards of gadget addiction.

STUDY LIMITATION

PSQI inventory was used for the dependent variable, a self-report questionnaire. Questions relate to sleep habits during the past month, and recall bias is unavoidable.

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CONCLUSION

It was concluded that two out of three students at the University need better sleep quality. The study findings are conclusive that the odds of having bad sleep quality are four times more in students using gadgets before bedtime than not using them. Furthermore, the odds of getting bad sleep are twice more, with students eating a heavy meal before bedtime, living in a hostel and sleeping in a noisy room.

Conflict of Interest: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

MZ & SW: Data acquisition, data analysis, data interpretation, approval of the final version to be published.

ABK & US: Conception, study design, drafting the manuscript, approval of the final version to be published.

SFM & AS: Critical review, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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