

Association of stress and sleep quality among the health sciences students: An analytical study

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ABSTRACT

Background: Stress termed as a state of both mental and physical tension and sleep quality defined as how well an individual sleeps, stress and sleep quality regarded as significant physical and mental health determinants.

Objectives: To determine frequency of stress and sleep quality and to determine association between stress and sleep quality among health sciences students of Sialkot.

Methods: The cross-sectional study was conducted after ethical approval on a sample of 264 students in Sialkot. A convenient sampling approach was utilized. The sample was gathered from private medical colleges of Sialkot having undergraduate health sciences students. Perceived Stress Scale (PSS) was employed to assess the levels of stress in students and Pittsburg sleep Quality Index (PSQI) was used for student's sleep quality. The Data was analyzed through SPSS software, version 22. Chi-square test was used (p -value ≤ 0.05 was considered significant).

Results: Study comprised of 264 undergraduates having a mean age of 20.82 ± 1.34 including 224 (84.4%) females and 40 (15.2%) males. Study showed high prevalence of stress and poor sleep quality with statistically significant association ($p=0.027$). Majority of students were experiencing poor sleep quality 232 (87.9%). 15 (5.7%) participants had low stress, 191 (72.3%) students were at the level of moderate stress and 58 (22%) were at severe stress level due to bad sleep quality.

Conclusion: The study concluded that there was high frequency of stress and poor sleep quality with significant association between stress and sleep quality but no significant association with demographics in targeted health sciences undergraduate students in Sialkot.

Keywords: Health sciences, Perceived Stress Scale (PSS), Pittsburgh Sleep Quality Index (PSQI), Quality, Sleep disturbance, Stress, Students.

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Introduction:

Stress is termed as a feeling of physical and emotional tension which might emerge from any incident or thought that prompted someone to become annoyed, angry, or nervous. Anxiety, anger, grief, guilt, or low self-esteem can cause stress. Stress can be physical, psychological, psychosocial, or psycho-spiritual.(1) Perceived stress is one of the crucial

psychological factors which refers to the extent to which one's life circumstances are stressful, uncontrollable, and unpredictable.(2)

It is crucial to comprehend how stress is commonly viewed in one's life because stress has been widely acknowledged as a significant contributor to health outcomes.(3) Stress has an association with different factors including working hours, sleep deprivation, a heavy administrative and clerical workload, a lack of allied health practitioners' support, high volume of challenging patients, subpar acquiring environments such as family, friends, and relationship issues. Inadequate spare time to relax or form new support networks, psycho-social difficulties caused by residence stress, insufficient coping skills, responsibilities for patient care, supervision of less experienced residents and students, challenging patients, information overload, and career development can be termed as some common stressors.(4) Students,

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especially medical students are those who experience stress more than others. Students who experience excessive stress during their medical education were more likely to have trouble resolving interpersonal disputes, have sleep issues, pay less attention, concentrate less, be tempted to cheat on exams, experience depression, lose their objectivity, commit more mistakes, and engage in improper behavior like negligence.(5)

Sleep is always termed as a state of rest as it is a periodic suspension of the state of awareness.(6) Sleep issues are widely spreading and becoming worse day by day. A decline over the past few years has been seen in the sleep quality among young adults, and huge ratios of them are students. Due to increased academic and social demands, irregular schedules, and other circumstances, students are more vulnerable to sleep problems and deprivation. The social life of college students involves a variety of entertainment alternatives as well as sleep-inducing products.(7) Poor sleep is considered a major health problem that exists around the world. In universities, insufficient sleep can seriously harm students' psychological and physical health as well as their ability to concentrate on their studies.(8)

Lack of sleep, an increase infrequency of short-term sleep, staying up late, rising up early have been associated to lower learning capacity, academic performance, and neurobehavioral functioning. Reduced or disturbed sleep, low academic performance, and extreme weariness have all been linked.(9) Perceived stress and sleep have some association with each other among undergraduate students of medical colleges.(10)

In most of the students, it has been observed that poor sleep quality has been associated with stress but lack of literature on demographics factors. This study addressed sleep disturbances and underlying stress in health sciences students and explored their relationship. The findings can help students to be well aware of their sleep quality and current level of stress. Thus, modifications can be done to minimize stress levels that can improve the quality of sleep and its related factors.

Methods:

The cross-sectional study was conducted after taking ethical approval from Imran Idrees Institute of Rehabilitation Sciences (Ref # IIIRS/DPT/PRI/IRB-605) from 23rd January 2023 to 25th May 2023. After calculation sample size turned out to be 264. Sample size was figured out by epitool software through

formula: $n = (Z^2 \times P \times (1 - P))/e^2$, where: - Z = value from standard normal distribution corresponding to desired confidence level (Z=1.96 for 95% CI) - P was expected true proportion - e was desired precision (half desired CI width) Estimated true proportion 27% (0.27) estimated population 2000, desired precision 0.05(5%), confidence interval 95%. Study comprised of undergraduate students of health sciences from Department of Physical Therapy (DPT), Human Nutrition and Dietetics (HND), and Doctor of Pharmacy (Pharm-D) of age between 17 to 23 from the private medical colleges of Sialkot including IIIRS(Imran Idrees Institute of rehabilitation sciences Sialkot), Islam College of Physical Therapy Sialkot, Sialkot College of Physical Therapy, University of Sialkot (Department of Pharmacy and Allied Health Sciences), University of Management and technology Sialkot, Imran Idrees College of Pharmacy, Sialkot. Convenient sampling approach was implemented for data collection. Self-reported questionnaire was prepared with the inclusion of basic information and informed permission, assuring security for data and confidentiality. The outcome tools were the perceived stress scale (PSS) with cronbach's alpha coefficient in between 0.70 and 0.85.—(11) Stress was categorized according to the scores on PSS as 0-13= Low stress, 14-26=Moderate stress, and 27-40=High perceived stress.(12) The other outcome tool was Pittsburgh Sleep Quality Index (PSQI) that has a reliability of 0.78.(13) Adding up the average scores of the seven factors gave PSQI score from 0 to 21, 0 to 4 representing good sleep and 5 to 21 denoting poor sleep.(14) SPSS Version 22 was used to analyze the data, frequency tables of categorical and mean and standard deviations were calculated for numerical data and fisher's exact test was applied for association of categorical data.

Results:

The participants had the mean age of 20.82±1.34 years. Females were 224 (84.8%) and males were 40 (15.2%). (Table 1) Out of total, 55 (22%) participants had high level of stress. (Table 2) The sleep quality index of 232 (87.9%) was poor and only 32 (12.1%) had good sleep quality. (Table 3) The fisher exact test scoring showed significant association in between perceived stress and sleep quality in undergraduate health sciences students of Sialkot with a p- value 0.027. Most of the students denoted moderate forms of stress with poor sleep value and p-value was significant at <0.05. (Table 4)

Table 1: Demographic characteristics of the participants

Demographics	Category	Frequency(%age)
Gender	Male	40 (15.2%)
	Female	224 (84.8%)
Body mass index	Underweight	46 (17.4%)
	Healthy weight	143 (54.2%)
	Overweight	54 (20.5%)
	Obese	21 (8.0%)
Socioeconomic status	Lower class	2 (0.8%)
	Middle class	247 (93.6%)
	Upper class	15 (5.7%)
Type of enrollment	Semester system	179 (67.8%)
	Annual system	85 (32.2%)
Semester no./ academic year	1-2 semester/ 1 st year	31 (11.7%)
	3-4 semester/ 2 nd year	23 (20.5%)
	5-6 semester/ 3 rd year	89 (33.7%)
	7-8 semester/ 4 th year	32 (12.1%)
	9-10 semester/ 5 th year	89 (33.7%)
Sleeping hours	2-4	44 (16.6%)
	5-7	155 (58.7%)
	8-10	61 (23.1%)
	11-12	4 (1.5%)

Table 2: Perceived stress categories of participants

Variable	Categories	Frequency(%age)
Perceived stress scale	Low stress	15 (5.7%)
	Moderate stress	191 (72.3%)
	High perceived stress	58 (22%)
	Total	264 (100%)

Table 3: Sleep quality index of participants

Variable	Categories	Frequency(%ages)
Sleep quality Index	Good sleep quality	32 (12.1%)
	Poor sleep quality	232 (87.9%)
	Total	264 (100%)

Table 4: Association of stress and sleep quality index of participants

Variable	Category	Perceived stress scale			Total	P value
		Low	Moderate	High		
Sleep quality index	Good sleep quality	1 (0.37%)	29 (10.98%)	2 (0.75%)	32 (12.12%)	0.027
	Poor sleep quality	14 (5.30%)	162 (61.36%)	56 (21.21%)	232 (87.87%)	
Total		15 (100%)	191 (100%)	58 (100%)	264	

Discussion:

The cross-sectional study on 264 undergraduate health sciences students of Sialkot was conducted to figure out the prevalence of stress and sleep quality and association between perceived stress and sleep quality in health sciences students of Sialkot. The study found that students were suffering from different levels of stress and had different types sleep quality. The designed study observed high frequency of stress and poor sleep quality with a significant association among them. Results of study were in line with a cross-sectional study conducted in Pakistan in 2021 which showed that most of the students belong to moderate stress level that had compromised their sleep. We observed that there was significant association between perceived stress and sleep quality, poor sleep quality led to the building of a moderate form of stress and its prevalence seemed high in medical students.(15) Students' especially medical students are those who experience stress more than others. Students who experienced excessive stress during their medical education were more likely to have trouble resolving their issues and experienced poor sleep quality. Our study found moderate stress and poor sleep quality had prevalence high among health sciences students of Sialkot. There was another study conducted in Indonesia that concluded that stress and the poor sleep quality were quite common in students and students with poor sleep quality were 4.7 times more likely to be stressed than those having good sleep quality. The study showed association between sleep quality and the level of stress among Students at the University of Indonesia ($p = 0.001$; $\alpha = 0.05$). (16) Sleep quality and stress both affect the health and academic performances of students. Our study showed that there was a huge ratio of students who experienced the stress and poor sleep quality at same time. In Jordan in 2022, a study stated

that stress and poor sleep quality were significantly frequent and strongly associated in medical students at the University of Jordan. 66.3% of the participants were stressed and out of 282 participants 61.7% were represented as poor sleepers. The chi-square test indicated significant association between stress and sleep quality ($P < 0.01$). (17) High prevalence of stress considered as a common issue in medical students, which can be favorable or unfavorable, while favorable stress facilitated the learning process in students while unfavorable stress affected the mental and physical health of students. (18) Stress affected the sleep quality of students and our study well documented that stress and poor sleep quality were highly prevalent and the stress and sleep quality were significantly associated among health sciences students of Sialkot. The results were similar to a study executed out in 2017 in Saudi Arabia at King Saud bin Abdul-Aziz University in which demonstrated that there was statistical significant association ($p < 0.001$) with high prevalence of poor sleep quality (76%) and stress (53%). (19) It's critical to identify student stress early. Early stress diagnosis allows us to properly counsel students and provide them with a variety of coping mechanisms to control stress. To avoid having stress impair their daily activities, students should be able to handle stress healthily. In this regard university administration professors and parents can assist students to overcome stress. (20)

There was a small sample size and a limited number of private medical colleges in Sialkot. Because of more females in health sciences the study can affect the implementation of results on both gender as females were more in the study. Further associated factors were not considered in the study including socioeconomic status, family education, and residential differences, job status and menstruation or such phase that can warrant the findings. The institutes should offer academic and

psychosocial support mechanisms to lower the level of stress and students should improve their sleep quality to have a healthy physical and mental state. Policy makers should be concerned about higher levels of perceived stress, and it is vital to create coping mechanisms to help students cope with this pressure and to create a proper learning atmosphere, so they can do better in exams and become leaders in their areas. We recommend students to receive appropriate counseling.

Conclusion:

The study concluded that there was high frequency of stress and poor sleep quality with significant association between stress and sleep quality.

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Authors Contribution:

Razaq R: Conception, Design, Data collection

Babar E: Conception, Design, Data collection, Literature review

Sajjad R: Statistical analysis, Design, Data collection, Literature review

Yousaf Q: Statistical analysis, Critical revision of drafted version to be published

Mahmood T: Statistical analysis, Design, Data collection, final approval, and guarantor of the version to be published

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