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RESEARCH ARTICLE

GENDER BASED DIFFERENCES IN SLEEP QUALITY AND STRESS AMONG MEDICAL STUDENTS

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Abstract

Medical training is the toughest course which demand hard work, strong effort and dedication from the medical students. Inability to cope with expected situation, medical students succumb to poor sleep quality and stress. This study analyzed gender-based differences in sleep quality and stress among 200 medical students at Government Medical College, Jammu, using the Pittsburgh Sleep Quality Index (PSQI) and Perceived Stress Scale-14 (PSS-14).

Aim : The primary aim of this study was to analyze gender differences in sleep quality and stress among medical students.

Method: This cross sectional study was conducted at Government Medical college, Jammu. 200 subjects were selected using a stratified random technique. 60 students were taken from each batch in the study. Pittsburgh sleep quality index scale and perceived stress scale questionnaire were given to assess sleep quality and stress level. SPSS software, version 21.0 was used to perform statistical analysis. The normality of the data was determined with the Shapiro- Wilk test and categorical variable were presented with the Chi- square test as numbers and percentages. A p- value less than 0.05 was considered statistically significant.

Result:-The study sample comprised of 114 female medical students. Quality of sleep scores in females were 59.65% and in males were 55.81% whereas 40.35 % of females and 44.19% of males reported poor sleep quality. Taking perceived stress symptoms, 16.67 % of females and 12.79% of males were classified under high stress whereas 8.77% of females and 25.58% of males reported low stress.

Conclusion: Poor sleep quality and stress are major problem among medical students as more than half the study subjects were found to have poor sleep quality and severe stress with even high prevalence rates in female medical students.

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Introduction:-

Poor sleep quality is very common health problem in medical students since they have hectic schedule, longer study hours, lifestyle choices and demanding academic loads. These factors puts medical student under constant stress. Research stated that sleep helps in solidification and consolidation of memories(1). It is not only important for consolidation but also for health helping the person to perform activity at its best (2). Other factors that cause poor sleep in medical student are poor accommodation and being away from family. Medical students reduce their sleeping time to have an extra hour for study and work so they may not consider sleep as a top priority(3). Inspite of environmental and cultural differences, 8 hours of sleep is needed for an adult. At first glance, less sleep increases productivity but in long term may lead to low productivity and more stress. During the training of medical students, stress may take a toll on their health because of irregular working hours and hard work.

Stress is defined by Hans Selye in 1936 as a non specific response of body to any demand for change. Stress usually occurs when person is unable to cope with responsibilities and goals. Favorable stress among medical students is known to have good effect on physiological functioning and helps in learning but distress has a bad effect on physical and mental health (4). Stress is one factor that have a profound effect on sleep quality. Moreover, sleep deprivation and fragmentation can lead to stress. The relationship between sleep problems and mood disorders is essentially important given the strong co-occurrence between these two. Gender is relevant to both sleep problem and mood disorders. Women(13.9%) usually reported poor sleep quality as compared to men (8.2%)(5). In some studies, it was found that female have greater stress symptoms as compared to males. This occurs because women have broader role in society and are assigned more responsibilty than men. Women perceive variety of scenarios as uncontrollable, negative and stress(6,7). The primary aim of this current study is to explore gender difference in sleep quality and stress among medical students.

Material and Method:-

The current study conducted in department of physiology was a cross sectional study. 200 subjects were selected using a stratified random technique. 60 students were taken from each batch in the study. All selected students provided written informed consent. Ethical clearance was taken from Institutional Ethics Committee, Govt. medical college. All selected students were given questionnaires to measure sleep and stress. Sleep quality was assessed by Pittsburgh sleep quality index. It consists of 19 self rated questions which are added to form seven components. The components are represented by ordinal variables from 0-3 where 0 means no difficulty and 3 means severe difficulty. These seven components are combined together to derive a global measure of sleep quality. Higher score indicate worse sleep quality and lower score indicate better sleep quality.A score of >- is cutoff that differentiate good sleepers from poor sleeper. (Ojeda- Paresdes et al., 2019). PSS14 scale was used to assess the stress level. Perceived Stress Scale-14 (PSS-14) is the most widely used psychological instrument for measuring the perception of stress. This scale has become a classic. It asks about feelings and thoughts of a person. Originally developed in 1983, it helps us understand how different situations affect one's feeling and perceived stress This scale include a number of direct queries about the levels of experienced stress. 14 items were designed to tap how unpredictable, uncontrollable and overloaded respondents find their lives. Out of the fourteen, 7 items are positively stated and 7 stated negatively. The scores from 0-13 were then categorized as low stress, 14-26 as moderate stress and 27-56 as high stress. A higher level of perceived stress is represented by a high total score as indicated by participants.

Results:-

Table1: Age specific and Gender specific Distribution of Students

Age (in years)	Males No. (%)	Females No. (%)	Total No. (%) N=200
18	5 (5.81)	1 (0.87)	6 (3)

19	10 (11.63)	9 (7.89)	19 (9.50)
20	18 (20.93)	27 (23.69)	45 (22.50)
21	14 (16.29)	31 (27.19)	45 (22.50)
22	25 (29.07)	36 (31.58)	61(30.50)
23	12 (13.95)	7 (6.15)	19 (9.50)
24	2 (2.32)	2 (1.76)	4 (2)
25	0 (0)	1 (0.87)	1 (0.50)
Total	**86(100)**	**114(100)**	**200**

Total Students =Mean age ± Standard deviation = 21.07 ± 1.35 years

This study group includes 200 healthy subjects in which 114 were female and 86 were male with an age range of 18 years to 26 years of age from all professions. The overall mean age was 21.07± 1.35.

Table 2:Gender specific distribution of Students

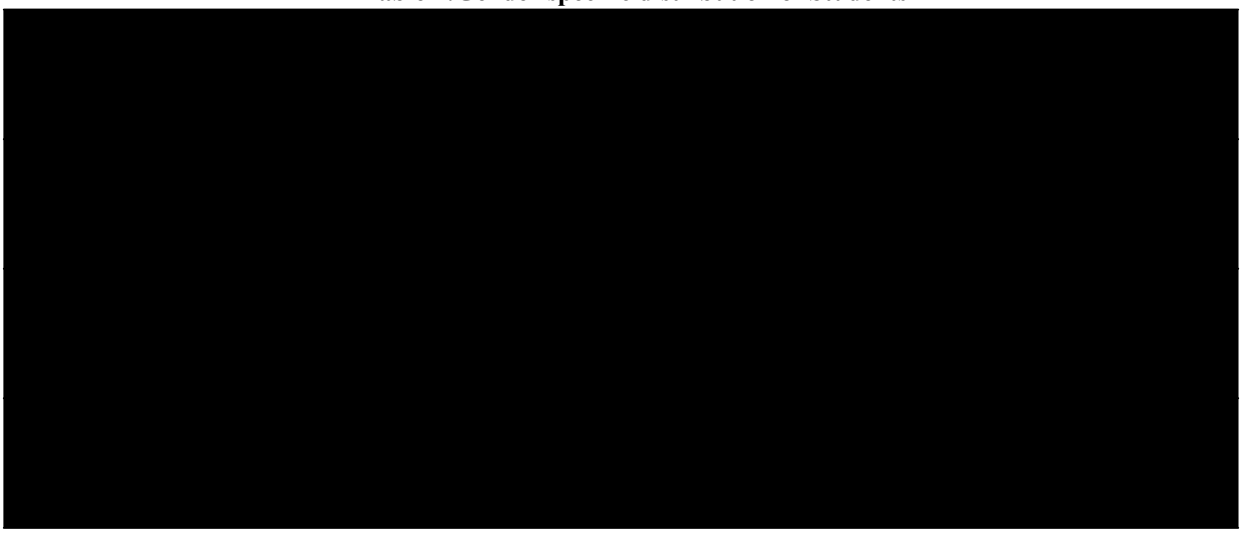

Table 3:Gender wise stress level reported by students as per PSS

Total Students =Mean PSS score ± Standard deviation = 24.04 ± 9.59 Males =Mean PSS score ± Standard deviation = 20.02 ± 8.56 Females =Mean PSS score ± Standard deviation = 27.07 ± 9.24

Reported in table 3, majority of the participants (85%) experienced low to moderate stress levels. However this percentage reveals a gender difference with 87.21% of males and 83.33% of females falling within this category. Specifically, 12.79% of males and 16.67% of females exihibited high PSS scores, Indicating a higher percentage among females. Additionally, the mean PSS score was 24.04 ± 9.59.

Table 4 Grades of PSQI among the students according to gender

Table 4 revealed that 58% of the participants demonstrated good sleep quality, indicated by a PSQI score of less than 5. However, the prevalence of poor sleep quality was notably higher among females (11.4%) compared to males (10.47%). Furthermore, a statistically significant correlation was identified between PSS and PSQI, with a p-value of 0.001, underscoring the strong relationship between perceived stress levels and sleep quality.

Discussion:-

This study explored significant gender-based differences in sleep quality and stress among medical students, with notable implications for academic performance and mental health. While 44.19% of males and 40.35% of females reported poor sleep quality (PSQI ≥5), severe sleep disturbances (PSQI >7) were slightly more prevalent in females (11.40% vs. 10.47% in males). Conversely, females exhibited markedly higher stress levels (mean PSS score = 27.07 vs. 20.02 in males), with 16.67% of females classified as high-stress compared to 12.79% of males.

Gender variance in Stress and Sleep:

The higher stress burden among females may stem from follwing factors:

1. Sociocultural Roles: Women often juggle academic pressures with societal expectations of caregiving and emotional labor, amplifying perceived stress (Matud, 2004; Eaton & Bradley, 2008).
2. Biological Factors: Hormonal fluctuations (e.g., menstrual cycles) and increased susceptibility to insomnia in females may exacerbate sleep fragmentation (Hapke et al., 2013).
3. Coping Mechanisms: Males are more likely to use problem-focused coping strategies, whereas females may engage in rumination, intensifying stress responses (Matud, 2004).

Revealing a concerning prevalence of poor sleep quality and heightened stress levels, especially among female students. The findings shed light on the complex relationship between sleep quality and stress, emphasizing their profound impact on overall health and mental well-being. Medical training exposes students to numerous challenges and stressors, which, if left unaddressed, can exacerbate stress and significantly impair sleep quality. A comparable study on medical students also highlighted poor sleep quality but did not examine the influence of gender, leaving a crucial gap in understanding these dynamics. The higher prevalence of poor sleep quality may be attributed to the extended duration of medical education, typically spanning 5.5 years, which is longer than most undergraduate programs. The bidirectional relationship between stress and poor sleep is evident in our findings ($p = 0.001$). Chronic stress disrupts circadian rhythms, while sleep deprivation damage emotional regulation, creating a vicious cycle. This aligns with studies linking sleep deficits to reduced academic performance and burnout (Curio et al., 2006; Azad et al., 2015).

Comparisons with Global Studies:-

Our results found similar to the study done by Sundas N et al and Surani AA in Nepal (44.2% poor sleepers; Sundas et al., 2020) and Pakistan (39.5%; Surani et al., 2015) respectively, but the gender-specific analysis adds novelty. For instance, Brazilian studies report higher female sleep disturbances, yet our data suggest males may be equally vulnerable to moderate sleep issues. This discrepancy could reflect cultural differences in stress perception or sleep hygiene practices. Some studies have found gender based differences within sleep quality; higher number of females in Brazilian study. In our study 33 female medical students had moderate sleep and 13 had severe sleep disorders.

A population-based study conducted in the U.S. reported that adolescent girls are more likely to experience poor sleep outcomes compared to boys (Roberts et al., Sleep, 2006 and Mathews KA Sleep et al.). This highlights the gender disparity in sleep quality which may persist in higher education settings like medical training. In our study PSS Score was high among females (76.56%) as compared to male. The mean PSS was 24.04±9.59. In 2016 study by Saeed AA reported mean PSS score to be 25.6±9.7.The result were more or less in line with the present study. Conclusion: Poor sleep quality and stress are major problem among medical students as more than half the study subjects were found to have poor sleep quality and severe stress with even high prevalence rates in female medical students. On the basis of our findings which indicate severe stress and poor sleep quality in female medical students, medical students need to be educated about sleep quality and negative impact of poor sleep quality. Establishment of academic counselling centers should be done that helps the students in improving study skills and in coping with their stressful environment.

Limitations:-

1. Cross-Sectional Design: Causality between stress and sleep quality cannot be conclude.
2. Single-Institution Bias: Findings may not generalize to non-government colleges or regions with different curriculum.
3. Self-Reported Data: Risk of recall or social desirability bias (e.g., underreporting stress).

Recommendations:-

Institutional Intervention :

- Stress Management Workshops : Integrate mindfulness and time-management training into curriculum.
- Sleep Hygiene Programs : Educate students on optimal sleep duration and screen-time reduction.

Policy Changes :

- Flexible Academic Schedules : Reduce overnight duties and stagger exam timetables.
- Counseling Services : Establish anonymous mental health support systems to address stigma.

Statistical analysis:-

SPSS software, version 21.0 was used to perform statistical analysis. The normality of the data was determined with the Shapiro- Wilk test and categorical variable were presented with the Chi- square test as numbers and percentages. Pearson correlation was employed to find correlation among parameters and p- value less than 0.05 was considered statistically significant.

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