Original article:

The relationship between depressive symptoms and sleep quality in medical students

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ABSTRACT

Aims and Objectives: This study was conducted to assesss the relationship between sleep quality and depressive symptoms in medical students. While poor sleep quality and sleep problems are signs of depression in adolescents, depressive symptoms among this age group further deteriorate sleep quality.

Materials and Methods: This work is a cross-sectional questionnaire-based study conducted at VIMS , Pawapuri   .The participants in this study were 307 undergraduate M.B.B.S students of the 1st,2nd ,3rd and 4th academic year of this college . A self-administered questionnaires were distributed to the students which collected information regarding participants'age, gender,habitat ,physical activity ,body mass index, addictions,   year of study, residence and background , the Beck Depression Inventory (BDI), and the Pittsburgh Sleep Quality Index (PSQI). Pittsburg sleep quality index (PSQI) score and Epworth sleepiness scale .

Result . .It was found that stress and and regular tea intake was very significantly associated with poor sleep quality whereas late night internet surfing and mobile usage for more than 1 hrs before sleep, irregular work and rest cycle and physical inactivity had significant association with poor sleep

Conclusions: This study shows a relationship between sleep quality and depressive symptom levels in medical students. The findings of the current research will contribute to the development of medical wellbeing programs that will be prepared with the aim of improving sleepquality and reducing depressive symptoms among medical students

Keywords:, , Beck Depression Inventory (BDI),Pittsburgh Sleep Quality Index(PSQI, depression

INTRODUCTION

Sleep is serves a restorative homeostatic function and appears to be crucial for normal thermoregulation and energy conservation [1.] Sleep deprivation and symptoms related to sleep disorders have not only been ignored but also inadequately understood. The prevalence of sleep disorders in the general population has been estimated to be 15% -- 35% [2,3.].Medical students are especially vulnerable to poor sleep, perhaps due to the long duration and high intensity of study, clinical duties that include overnight on-call duties, work that can be emotionally challenging, and lifestyle choices[.4)]

The association between sleep quality and psychiatric disorders has been described in previous researches . Previous studies have also confirmed that individuals with sleep disturbances may be at risk for the development of depression There is a very close relationship between major depressive disorder (MDD) and sleep problems. While a significant percentage of people with MDD complain of sleep disturbances, depression symptoms are seen more frequently in people with sleep disturbances. Although sleep disturbances are typical characteristics of MDD, sleep disturbances may appear beforeMDD episodes.

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Research on sleep disturbances in undergraduate medical students is of particular interest because of the known relationship between sleep and mental health[5] and the concern that the academic demands of medical training can cause significant stress[6,7]. A large body of evidence supports the notion that good quality sleep is important for optimal neurocognitive and psychomotor performance as well as physical and mental health[8]

Many factors determine sleep quality, and some of the important ones are age,gender, habitat, body mass index (BMI),physical activity or sports, smoking[9]Recent studies have demonstrated that the sleep–wake cycle of medical students is characterized by insufficient sleep duration, delayed sleep onset, and occurrence of napping episodes during the day [10, 11]which has been found to affect cognitive function in medical students [12]. Moreover, multiple studies have indicated a high correlation between sleep duration and performance in some activities and in subjective alertness [13, 14]..

Despite inherent importance of sleep, there is limited information about sleep behavior and sleep disturbances in medical college students[15]This study was designed to assess the various factors which affect the quality of sleep among the undergraduate medical students

Some recent studies pointed out the connection between adolescent sleep problems and depressive symptoms. One study in the United States found that adolescents with sleep disturbances have a higher rate of depressive symptoms than adolescents without sleep disturbances 16. However, one study reported not finding a strong association between sleep disturbances and depressive symptoms 17. It has also been demonstrated that sleep disturbances and depressive symptoms are closely related, and insufficient sleep may result in depressive symptoms in adolescents (18). Guo et al. found that students with depressive symptoms were approximately 2.5 times more likely to suffer from sleep disorders 19). In another study among adolescents,short sleep durations were associated with suicide, illicit drug use, and depression as defined by the Center for Epidemiologic Studies Depression scale 20

 Although the relationship between sleep quality and depressive symptoms has been identified in adults, studies investigating relationships between sleep disorders and depressive symptoms in medical students who have different sleep needs and sleep cycles compared to other adults are limited. The present study aimed to explore the relationship between sleep quality and depressive symptoms in medical students

METHODOLOGY

STUDY DESIGN : This cross-sectional study was conducted at VIMS in Pawapuri .The participants in this study were 307 undergraduate M.B.B.S students of the 1st,2nd ,3rd and 4th academic year of this college . Among them, 72 were female and 235 were male. Students who were willing to participate were given a brief description about the study and its aims & objectives. Verbal consent of each student was taken and were assured about the confidentiality . Students with chronic diseases or sleep disorders were excluded . The ethics committee of the institute approved the study. Recruitment and collection of data continued for four weeks in the month of January A self-administered questionnaires were distributed to the students which collected information regarding participants'age, gender,habitat ,physical activity ,body mass index, addictions, year of study, residence and background , Beck Depression Inventory (BDI) ,Pittsburg quality of sleep index (PQSI) score and Epworth daytime sleepiness scale (ESS).The recruitment and collection process was carried out under the supervision of the authors and the help of 10 previously trained senior medical students . After completion, the questionnaires were collected from the students and the incomplete ones were removed from the study.

The analysis was performed using Graphpad instat prism 6. T-test was then used for processing quantitative information and chisquare test for the qualitative information. Statistical significance was accepted at P<0.05. .Instrumental tools used in the study

Pittsburg Sleep quality Index (PSQI)[21] It is a self report instrument to assess the quality of sleep. The Pittsburgh sleep quality index (PSQI), a self-rated questionnaire that assesses sleep quality over a time interval was adopted in the survey. Seven properties of sleep were evaluated by this questionnaire:

1. Sleep quality of the individual 2. Time it takes for an individual to sleep 3. Duration of sleep 4. Sleep efficiency 5. Bedtime problems 6. Use of sleeping medication 7 Impairment in daily functioning The scores for each question range from 0 to 3, with 0 indicating the highest sleep quality and 3 indicating the lowest one. The seven component scores are then added to yield a global PSQI score in the range of 0 to 21; the higher the score is, the worse the sleep quality. A global score equal or greater than 5 indicates poor sleep quality in the past month.

Beck Depression Inventory (BDI)[22,23] : . The BDI was designed by Beck et al. in 1961 and the validity and reliability of the scale were assessed by Hisli in 1989 22,23. The Cronbach alpha of the scale was 0.86 in the current study.

Epworth Sleepiness Scale (ESS)[24]: It is a scale intended to measure daytime sleepiness that is measured by use of a very short questionnaire. This can be helpful in diagnosing sleep disorders. It was introduced in 1991 by Dr. Murray Johns of Epworth Hospital in Melbourne, Australia. The questionnaire asks the subject to rate his or her probability of falling asleep on a scale of increasing probability from 0 to 3 for eight different situations. The scores for the eight questions are added together to obtain a single number. A number in the 0-9 range is considered to be normal while the numbers 10 and 11 are border line and 12-24 range indicates that expert medical advice should be sought.

RESULT

A total of 307 responses were obtained of which 67.42 % were considered poor sleepers. The mean age of the participants, which ranged from 17 to 24 years, was 20.54 . Among this population, 235 (76.54%) were male and 72 (23.45%) were female. The students were distributed among the four academic years. Daily sleeping hours of 4 - 6 hours were reported by 213 (69.38 %) of the participants and 7 - 10 hours by 66 (21.49%). A small numbers of students 28(9.12%) slept less than 4 hours or more than 10 hours . Among the students, 100 (32.54%) had normal PSQI scores and 207 (67.42%) had PSQI > 5 scores.indicating poor quality. Daytime sleepiness was assessed using the ESS. 193 students had ESS <10 while 114 (37%) students had ESS >10 indicating increased daytime sleepiness among them.

TABLE 1 presents the complete demographic characteristics and other study variables.

TABLE 2 presents the analysis of BDI scores and other study variables with PSQI scores. A multivariate analysis of sleep disturbance revealed that sleep quality had a significant relationship with depression. Sleep quality also had a significant relationship with ,female gender , habitat, sleeping hours and daytime sleepiness .Sleep quality was significantly poor among students having ESS>10. 114.students had daytime sleepiness of which 91.2% had poor quality which was very significant (p<.0001).However sleep quality was not significantly associated with the body mass index of the students .

Table 1: Demographic Characteristics and Other Variables of the Study Population

Variables		NO(%)
GENDER	MALE	235 (76.5)
	FEMALE	72 (23.4)
ACADEMIC YEAR		
	FIRST	90(29.3)
	SECOND	72(23.4)
	THIRD	61 (19.9)
	FOURTH	84 (27.4)
HABITAT		
	HOSTEL	274 (89.3)
	HOME	33 (10.7)
BMI		
	<18.5	61(19.9)
	18.5-24.9	135 (44)
	25- 29.9	73 (23.8)
	>30	38 (12.4)
SLEEP HOURS		
	4-6	213 (69.4)
	7-10	66 (21.5)
	OTHERS	28 (9.1)
PSQI		
	<5 (NORMAL)	100 (32.6)
	≥ 5 (ABNORMAL)	207(67.4)
ESS		
	<10(NORMAL)	193 (62.9)
	≥10 (ABNORMAL)	114 (37.1)

Table 2. Analysis of PSQI Scores with BDI and Other Study Variables

VARIABLES		PQSI < 5	PQSI ≥ 5	TOTAL	P VALUE
SEX					<.05
	MALE	84 (35.74)	151(64.26)	235	
	FEMALE	16 (22.22)	56(77.77)	72	
BDI					
	Normal	72	114(55.07)	186	<0.05
	Mild	21	64(31.02)	85	
	Moderate	07	19 (9.17)	26	
	Severe	0	10 (4.8)	10	
SLEEP HOURS(in hrs)					<.05
	4-6	55 (25.8)	158 (74.2)	213	
	7 -10	28 (42.4)	38 (57.6)	66	
	OTHERS	17(60.7)	11 (39.3)	28	
ESS					<.0001
	<10 (NORMAL)	90 (46.6)	103 (53.4)	193	
	>10 (ABNORMAL)	10 (8.8)	104 (91.2)	114	

DISCUSSION

In the present study , decreased sleep quality was found to be very common among medical students as 207 (67.42%) students reported poor sleep quality.[25] A high percentage of respondents i.e > 213 (72%) got less than 7 hrs of sleep per night. .Similar findings were shown wali et al [26] and another studies in Iran[27] Sleep deprivation is associated with a variety of adverse consequences and can result in significant changes in cognitive functioning, short-term memory and concentration. [2]

In the previous study, several factors such as gender, habitat, sleep hours, and daytime sleepiness were associated with sleeping disorder among medical students. Our results were consistent with the findings of Nojomi et al. [28] .

In the current study, the prevalence of medical students with severe depressive symptoms

was 4.8% and there was a moderate positive relationship between sleep quality and depressive symptoms. Brooks et al. reported that 43.5% of students experienced depression and that 38% had problems associated with sleeping or going to sleep (5). In another study, Moo-Estrella et al. reported that students with depressive symptoms suffered more from daytime sleepiness (29). Guo et al. found that students with depressive symptoms

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were approximately 2.5 times more prone to sleep disorders (30. Due to the bidirectional relationship between depressive symptoms and sleep disturbances, it is difficult to identify the cause and effect. However, it has been suggested that the combination of insomnia and depression influences the severity and duration of MDD as well as relapse rates, whereas pharmacological and nonpharmacological interventions for insomnia may favorably reduce and possibly prevent MDD (31). Therefore, early identification of students with sleeping problems may prevent a depression in the future.

The main limitations of the study is that it is based only on subjective assessment by the respondent. False information may be provided by students answering the questionnaires, and students may also be unable to understand or may misinterpret the questions. Additional research involving a much larger and more diverse sample students is suggested to assess a wider perspective on sleep quality and depressive symptoms . Because the study was crosssectional, it was difficult to come to a conclusion as to whether poor sleep quality leads to depressive symptoms or depressive symptoms cause poor sleep quality. Using a self-declaration scale based on subjective measurements

could cause bias in selections.

As medical colleges strive to provide the optimal learning environment to students, more attention needs to be directed towards improvement of students' quality of life. Medical schools should build reforms in medical education and provide recreation centers in order to minimize the stress among students.This can be achieved by establishing counselling facilities that can serve those with physical and psychological difficulties. Medical students, on the other hand, would also have to identify their problems and seek for an advice from the faculty in order to find solutions for it.

Conclusions

In conclusion, two-third of the medical in the current study suffered from poor sleep quality; 39.4%

presented with mild, moderate, or severe levels of depressive symptoms; and there was a moderate positive relationship between sleep quality and depressive symptoms. These findings demonstrate the significance of preventative initiatives aimed at improving sleep quality

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