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Factors associated with Sleep Quality in Undergraduate Physiotherapy Students: A Cross-Sectional Study

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ABSTRACT

Introduction: Sleep also is considered a time when other body system restores their energy and repairs their tissues and is important to wellbeing and optimal health. Lack of sleep is reason for many mental conditions in all stages of human lives specially during studentship.

Objective: To evaluate the factors associated with quality of sleep among undergraduate physiotherapy students.

Methods: Undergraduate physiotherapy students aged 18-25 years and studying in Nootan College of Physiotherapy, Visnagar and SPB Physiotherapy College, Surat were explained about the procedure and informed consent was obtained. Participants were asked to fill the hard copy of Pittsburgh Sleep Quality Index (PSQI) for assessment of the sleep quality, Depression Anxiety Stress Scale (DASS) for assessment of the depression, stress and anxiety. Participants were asked to fill the questionnaire. Body Mass Index (BMI), total minutes of physical activity done by participant per week and the total duration of use of electronic devices during bedtime of each participant were recorded.

Results: Regression analysis shows that obesity contributes to 0%, depression contributes to 9%, stress contributes to 13.7%, anxiety contributes to 10.6%, physical activity contributes to 2.4% and use of the electronic device during bedtime contributes to about 2.2% in affecting sleep quality.

Conclusion: Our results support the idea that sleep quality in physiotherapy students is notably associated with several psychological factors like Stress and Anxiety. Hence, Psychological Stress and Anxiety should be evaluated and treated for good quality of sleep in undergraduate physiotherapy students. There is a need to do further study with a large sample size to check various factors associated with poor sleep quality.

Key Words: Sleep quality, Factors affecting sleep quality, PSQI, DASS, Physical activity, Electronic device use

INTRODUCTION

Sleep is a part of what is called the sleep-wake cycle. This sleep-wake cycle, which consists of roughly 8 hours of nocturnal (night) sleep and 16 hours of daytime wakefulness in humans. It is controlled by a combination of two internal influences: sleep homeostasis and circadian rhythms.¹ Sleep also is considered a time when other body system restores their energy and repairs their tissues² and is important to wellbeing and optimal health.^{3,4} People who get adequate quality sleep are more energetic. They have a better cognitive function; likewise improved memory and better immune system. Alongside their alertness, attentiveness and performance throughout the day are considerably enhanced.⁵

Although sleep is amongst others one basic need of human beings and is important to their health⁶ its problems have a plethora of causes including medical and psychological conditions.⁷ Many factors were reported to affect sleep. Major ones include emotional well-being, physical activity, and social factors. Sleep problems cover a vast range of symptoms and are mostly characterized by one or more of the symptoms like restlessness, fatigue, insomnia, daytime sleepiness, loud snoring, gasping sounds during sleep, inability to fall asleep at night or appropriate sleeping hours, unable to move, and abnormal behaviours like sleepwalking and others like excessive sleepiness during day time.⁸⁻¹⁰ Poor sleep has been closely related to mood disturbance and other health issues,¹¹ which include increased Body Mass Index (BMI), high

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blood pressure and Depression.¹² The recent trend of using electronic gadgets like mobile phone, laptops or others for gaming, social networking or other uses also contribute to the quality of sleep.¹³ The reason for using such devices varies though it does have a relation with stress and sleep quality directly and indirectly on obesity.¹⁴ Less number of studies is prevailing to explore the sleep quality and factors affecting it, for Indian undergraduate students. This research measures the quality of sleep in undergraduate physiotherapy students and the effect of depression, stress, anxiety, obesity, physical activity and the duration of use of electronic gadgets during bedtime on the quality of sleep.

MATERIALS AND METHODS

This is a cross-sectional study approved by the Institutional Ethical Committee of SPB Physiotherapy College, Gujarat, India. Convenient sampling was performed to select undergraduate physiotherapy students as study population. This study was conducted at Nootan College of Physiotherapy, Visnagar and SPB Physiotherapy College, Surat in 257 students.

Inclusion and Exclusion Criteria

Undergraduate students of physiotherapy aged between 18-25 years of both gender were included in this study. The student with illness and were not present in class during ongoing studies were excluded.

Procedure

Prior information regarding the study and questionnaire to be filled were given to the students. After taking consent from each physiotherapy students of the first, second, third and final years, demographic data like age, gender, height, the weight of each student were recorded. BMI was calculated by dividing the weight (kg) by square of height (m)¹⁵. The total duration of exercise per week in a minute and the total duration of use of electronic devices like mobile phone, TV, laptop during bedtime in a minute of each student were recorded. The hard copy of Pittsburgh Sleep Quality Index (PSQI), Depression Anxiety Stress Scale (DASS) was given to the student and asked to fill. After the data collection, all the data were analysed.

Outcome measures

Body Mass Index (BMI): It was calculated by dividing the weight (kg) by square of height (m).¹⁵

Pittsburg Sleep Quality Index (PSQI)

It is used for the subjective assessment of sleep quality.¹⁶ There is "Global Sleep Quality" (GSQ) which is a computed score of the total of all the response values for seven com-

ponents included in the PSQI scale. PSQI has seven components with score 0 (no difficulty) to 3 (severe difficulty). Summation of all the component scores is known as the global score with a range of 0 to 21. A score of more than 4 indicates poor sleep quality and score less than 4 indicate good sleep quality. Higher the score poorer is sleep quality.¹⁷

Depression Anxiety Stress Scale (DASS)

The DASS is a 42 item scale design to measure the three related negative emotional states of depression, anxiety, and stress. The 42 questions are related to depression, anxiety and stress are summed up respectively. The score interpretation is based on normal, mild, moderate, severe, and extremely severe.¹⁸

Physical activity

According to world health organization (WHO) adults of age 18-64, Should do at least 150 minutes of moderate-intensity physical activity throughout the week, or do at least 75 minutes of vigorous-intensity physical activity throughout the week, or an equivalent combination of moderate- and vigorous-intensity activity to be called as a physically active.¹⁹ We have recorded the total duration of physical activity in a minute per week of each participant.

Use of electronic devices during bedtime

We have recorded a total duration of use of electronic devices like mobile phone, TV, laptop in a minute during bedtime.

Statistical Analysis

SPSS 24.0 was used for data analysis. Demographic data were presented as mean and standard deviation. Frequencies and percentages were calculated for the categories of Body Mass Index (BMI), Pittsburgh Sleep Quality Index (PSQI), Depression Anxiety Stress Scale (DASS), physical activity and use of the electronic device during bedtime. Regression analysis was done to find out the association between BMI, depression, anxiety, stress, physical activity, duration of electronic device use during bedtime and sleep quality. A level of significance was considered at $P < 0.05$.

RESULTS

Descriptive statistics are given in Table 1. Table 2 shows the frequencies and percentages of data on outcome measures. Table 3 shows that there is weak correlation between total score of PSQI and BMI ($r = 0.06$), total score of depression ($r = 0.30$), total score of stress ($r = 0.37$), total score of anxiety ($r = 0.33$), minutes of exercise per week ($r = 0.16$) and minutes of use of electronic device during bedtime ($r = 0.16$). Table 3 also shows that BMI contributes to 0%, depression contributes to 9%, stress contributes to 13.7%, anxiety con-

tributes to 10.6%, physical activity contributes to 2.4% and use of the electronic device during bedtime contributes to about 2.2% in affecting sleep quality. In total all the factors contributes to about 18.5% ($r^2 = 0.185$) in affecting sleep quality amongst undergraduate physiotherapy students.

DISCUSSION

The primary goal of this study was to determine the effect of different factors that are obesity; stress, anxiety, physical activity and electronic gadgets use time duration on quality of sleep in undergraduate physiotherapy students. The effect of all the mentioned factors has been evaluated separately. It is found that all the measures that are BMI, depression, anxiety, stress, exercise minutes and use of electronic devices had a weak correlation with sleep quality. Meanwhile, in the study Association between sleep pattern and body mass index among undergraduate health colleges students at Qassim University, Saudi Arabia suggested that there was no correlation between sleep quality and BMI.²⁰ It also recommended variations in physical activity, food habits and mental stress along with accurate time management for those suffering from poor sleep quality. However, in a study perception of sleep disturbances among young medical students concluded that there was a high correlation between electronic gadgets use as well as worrying with poor sleep quality.²¹ Alongside, it stated that the effect was opposite, that is, due to poor sleep patterns, disturbances in sleeping and poor sleep quality; light emitting electronic gadgets were used. Additionally, in another study, Physical activity and sleep quality in concerning mental health among college-going students reported a significant correlation between lack of physical activity and psychological stress on sleep patterns and psychological health of students.²²⁻²⁴ Factual data based on a clear understanding of all the questions is important for such a study. So forth, collecting data after a clear understanding of the question is of great significance while filling the questionnaire by all the participants as the analysis is to be done completely based on participant response in PSQI except for calculative evaluation of BMI. For the same, each question of PSQI was explained to students with proper examples and criterion, for example, the hours spent on using electronic gadgets before sleep should include only that time which they spent on the bed being awake; and not other time of mobile use. We found a weak correlation between sleep quality and stress, BMI, anxiety, depression, physical activity and use of the electronic device. This variation may be possibly due to small sample size. These studies and our research altogether support the idea that psychological stress that is stress and anxiety has a notable contribution to the quality of sleep in undergraduate students. Limitations of this study are; All the information in the study was collected by the self-reported through the questionnaire so there can be a bias answers. Since we have

taken the physiotherapy students for the study, the inclusion of male student is less, as there are more female students in the physiotherapy field rather than the male one. Results are directly based on the information given by the students hence wrong answers can change the interpretation.

CONCLUSION

Our results support the idea that sleep quality in physiotherapy students is notably associated with several psychological factors like Stress and Anxiety. Meanwhile, Sleep quality has a minimal association with Depression, physical activity and use of Electronic device. Another factor, BMI has no association with sleep quality in undergraduates. Hence, Psychological Stress and Anxiety should be evaluated and treated for good quality of sleep in undergraduate physiotherapy students.

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Table 1: Descriptive statistics

No	Outcome Measures	Mean (SD)
1.	Age	20.33 ± 3.2
2.	Total score of PSQI	3.99 ± 2.26
3.	BMI	21.43 ± 3.98
4.	Total score of Depression	5.17 ± 5.48
5.	Total score of Anxiety	6.36 ± 4.79
6.	Total score Stress	9.66 ± 6.29
7.	Total duration of physical activity in minutes per week	85.06 ± 77.84
8.	Duration of electronic device use in minutes during bedtime	78.23 ± 57.10

Table 2: Frequencies and percentages of outcome measures

Outcome measures	Category	Total (n) (%)	PSQI poor	PSQI Good
			N (%)	N (%)
BMI	Underweight	67(26.07)	19(28.35)	48(71.64)
	Normal	149(57.97)	50(33.55)	99(66.44)
	Overweight	30(11.67)	11(36.66)	19(63.33)
	Obese 1	11(4.280)	6(54.54)	5(45.45)
	Obese 2	00	00	00
	Obese 3	00	00	00

Table 2: (Continued)

Outcome measures	Category	Total (n) (%)	PSQI	
			PSQI poor N (%)	PSQI Good N (%)
Depression	Normal	220(85.60)	49(22.27)	171(77.72)
	Mild	17(6.61)	7(41.17)	10(58.82)
	Moderate	14(5.44)	8(57.14)	6(42.85)
	Severe	6(2.33)	4(66.66)	2(33.33)
Stress	Normal	210(81.71)	28(13.33)	182(86.66)
	Mild	26(10.11)	11(42.30)	15(57.69)
	Moderate	17(6.61)	10(58.82)	7(41.17)
	Severe	4(1.55)	3(75)	1(25)
Anxiety	Normal	185(71.98)	38(20.54)	147(79.45)
	Mild	27(10.50)	11(40.74)	16(59.25)
	Moderate	32(12.45)	15(46.87)	17(53.12)
	Severe	13(5.05)	8(61.53)	5(38.46)
Physical activity	Active	52(20.23)	32(61.53)	20(38.46)
	Non active	205(79.76)	45(21.95)	160(78.04)
Electronic device use	Yes	250(97.27)	83(33.2)	167(66.8)
	No	7(2.72)	0(0)	7(100)

Table 3: Correlation of various factors with quality of sleep

No	Outcome measures	Pearson correlation coefficient (r)	Regression coefficient	
			r ²	P
1.	Total score of PSQI and BMI	0.06	0.000	0.086
2.	Total score of PSQI and score of depression	0.30	0.090	0.844
3.	Total score of PSQI and score of stress	0.37	0.137	0.002
4.	Total score of PSQI and score of anxiety	0.33	0.106	0.092
5.	Total score of PSQI and minutes of physical activity per week	0.16	0.024	0.002
6.	Total score of PSQI and minutes of use of electronic device during bedtime	0.16	0.022	0.124