

ORIGINAL ARTICLE

Correlation between perceived social support and quality of sleep and its effect on the academic performance of undergraduate medical students: A cross-sectional study

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ABSTRACT

Background: Social support can be explained as the availability or existence of people who make us feel loved, cared for and valued, people on whom we can rely. Apart from physical health, social networking and interaction uplift mental health, well-being, and academic performance of individuals. Sleep has been associated with achievements in academic indicators of a person, as its deficit causes a lack of attention and concentration. **Methods:** A survey was designed to conduct cross-sectional study among the undergraduate medical students. The validated 12 item multidimensional scale of perceived social support and 19 self-rated questions of Pittsburgh sleep quality index was used for assessing the social support and sleep quality among the students and how it affected their academic performance. Data was collected in google forms and coded & cleaned and then exported for statistical analysis, to SPSS version 20. **Results:** Of the total 385 undergraduate medical students, majority were female respondent and from 2nd Professional. Most of the students scored between 60-69% in their university exam. Majority of the student has poor sleep quality. The academic performance has statistically significant association with perceived social support while age of the student was significantly associated with poor quality of sleep. A negative correlation was noted between perceived social support and sleep quality. **Conclusion:** This study has highlighted the negative impact of a lack of perceived social support on the sleep quality of medical students. Results also showed evidence of an overall poor quality of sleep in the medical students.

KEYWORDS

Perceived Social Support, Sleep Quality, Academic Performance, Medical Student.

INTRODUCTION

Having social relationships is a prerequisite for healthy development as well as rational behavior. Social support is the accessibility of

love, care, value and reliance to an individual through a myriad of social networks. It has been found to produce more positive effects in a person's life than negative ones and enables

a person to persevere even under unsuitable circumstances. (1) Social support has both structural and functional aspects to it. While the structural part only deals with the existence of relationships, the functional aspect refers to the resources that one encounters within one's social network. (2) Structural support has been demonstrated to affect the quality of life whereas functional support demonstrates the stress-buffer hypothesis. (3) The social determinants of mental health have not been prominent in research until recently. Recent integrated models have brought forth the notion that there are many ways in which the social aspect of psychiatry combines with the biological and psychological aspects. (4)

For a majority of medical students, college time is a developmental period for transition-age youth. This is the time when most of them first start to live an autonomous way of life, taking over responsibilities and making their own decisions. Hence the radius of their social support expands from just their parents to peers and significant others. The lack of significant statistical data dealing with the significance of social support in the lives of medical students led to the commencement of this study, which aims to establish its correlation with sleep quality as well as academic performance.

Medical students, in comparison to the rest of the population, have been found to experience poorer quality of sleep. This can be attributed to many causes, such as greater academic pressure, irregular daily routine because of longer studying time, financial debt, lack of leisure time, and poor lifestyle choices. (5) The high number of medical students having poor quality of sleep has been documented by many studies. (6)(7) Sleep disturbances such as sleep deprivation (6) and excessive daytime sleepiness (EDS) (7) have also been reported. While many studies have described the existence of poor quality of sleep among medical students, not many have studied its causality or consequences.

OBJECTIVES

1. To assess social support received by medical students through family, friends and significant other.

2. To assess the quality of sleep amongst medical students.
3. To determine the effect of social support and sleep disorder on the academic performance of medical students.

MATERIAL & METHODS

Study Design & Participants: We conducted a cross-sectional study among the medical undergraduate students in one of the government medical college in north India.

Inclusion criteria:

Students currently pursuing MBBS and have appeared in at least one professional examination.

Participants who volunteer to participate and provide written informed consent.

Participants who have access to a smartphone and an active internet connection.

Exclusion criteria:

Medical students who have not yet appeared in any professional examination.

Medical students who don't have smartphones.

Sample Size: Since, no similar study has been previously conducted in this area, taking prevalence (p) of 50% for the purpose of calculating the maximum sample size and applying the formula for sample size calculation $= Z^2 (1-\alpha)^2 \times p \times q / d^2$

Where,

Z= 1.96 (at 95% confidence interval)

p= prevalence rate (50%)

q= 1-p

d= absolute error as 5%

Final sample size = 385.

The medical students from 2nd professional to interns were approached. Students were briefed about the objectives of this study and it was ensured that the information provided by them will be kept confidential and their anonymity will be maintained. Informed consent was taken from every respondent and the validated questionnaire was administered through a google form circulated via WhatsApp group.

Study Instruments:

It consists of questions about the general profile of the respondent.

Multidimensional Scale of Perceived Social Support (MSPSS)(8) – It is a 12-item scale, with

the items divided into 3 groups which are the major sources of social support – Family, Friends and Significant others. The items have to be answered on a 7-point Likert scale, ranging from 1 (very strongly disagree) to 7 (very strongly agree).

Pittsburgh Sleep Quality Index (PSQI) (9) – It consists of 19 questions that are self-rated and 5 questions to be rated by roommate or bed partner, which were optional. Only the 19 questions, that were self-rated are counted in the global score. It assesses many factors that influence the quality of sleep, like duration, latency, efficiency, disturbances, medications and daytime dysfunction. The 19 items are divided into 7 components, with each having a scoring scale of 0-3. The scores of the 7 components are then added to give a global PSQI score, ranging from 0-21. Poor sleep quality was indicated by a global score of >5.

Data collection and Statistical analysis

Data collected via Google forms was exported to Microsoft Excel 2016. For statistical analysis, Statistical Package for the Social Sciences (SPSS) version 20.0 was used. The results of the latest professional examinations of the eligible respondents were noted from the batch mark sheet published by the Controller of Examination. The quantitative

and categorical variables were described using descriptive statistics (mean, standard deviation, frequencies and percentages). Statistical analysis was performed using a chi-square test to determine if there exists an association among variables, and p-value<0.05 was considered significant. Further, a Pearson's product-moment correlation was run to assess the relationship between social support, sleep quality of medical students and their academic performance.

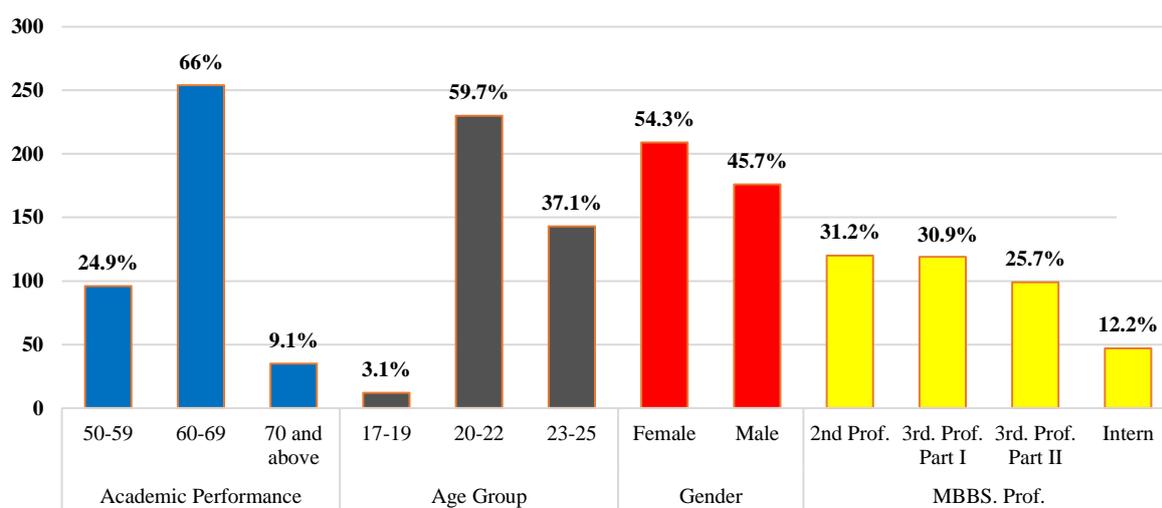
Ethical consideration

The study was commenced after prior ethical clearance from the Institutional Ethics Committee.

RESULTS

Out of the 385 medical students who participated in the survey, the majority (230 (59.7%)) of the students were between age group of 20-22 years. 54.3% (209) were female and 45.7% (176) were male. Maximum number of the students (120 (31.2%)) who responded were from 2nd Professional while the least response (47 (12.2%)) was received from the interns. The majority of the students (254(66%)) scored between 60-69% in their university exams (Figure 1).

Figure 1 Distribution of study participants according to Academic Performance, Age group, Gender and MBBS Professional



The highest mean score of 5.79 was observed for family. The total MSPSS has 5.39 ±1.39 of mean and standard deviation (Table 1).

According to MSPSS, students were categorized as having low (14 (3.6%)), medium (104 (27%)) and high (267 (69.4%)) social

support as perceived by them. On applying chi square test, academic performance of the student was found to be significantly associated with perceived social support level ($\chi^2=10.912$, $p=0.028$). The variables like age, gender, professional year in which the students are studying and the perceived social support level has no statistically significant association (Table 2).

Considering the components of PSQI, the medical students showed the highest mean and standard deviation score (2.14 ± 1.85) for sleep latency and lowest (0.18 ± 0.55) for use of sleep medication. The global PSQI score has mean and standard deviation of 7.40 ± 4.01 (Table 3).

Most students (245(63.6%)) scored PSQI of more than 5, which indicate poor sleep quality.

On applying chi square test, age and PSQI score was noted to be statistically significant ($\chi^2=$

9.327 , $p=0.009$). The variables like gender, professional year in which the students are studying and academic performance of the student and PSQI score has no statistically significant association (Table 4).

Preliminary analyses showed linear relationship with both variables normally distributed, as assessed by visual inspection, and there were no outliers. Pearson's correlation analysis showed a significant small negative correlation between sleep quality and perceived social support ($r= - 0.163$, $p = 0.001$). There was no significant correlation between both academic performance and social support ($r= - 0.060$, $p = 0.242$) as well as academic performance and sleep quality ($r= - 0.037$, $p = 0.472$). (Table 5).

Table 1: Multidimensional Scale of Perceived Social Support Item and Subscale Means and Standard Deviations

No.	Multidimensional Scale of Perceived Social Support (MSPSS) Items	Mean	SD
1	There is a special person who is around when I am in need.	4.90	1.62
2	There is a special person with whom I can share my joys and sorrows.	5.18	1.59
3	My family really tries to help me.	6.15	1.29
4	I get the emotional help and support I need from my family.	5.90	1.42
5	I have a special person who is a real source of comfort to me.	5.12	1.75
6	My friends really try to help me.	5.35	1.41
7	I can count on my friends when things go wrong.	5.20	1.52
8	I can talk about my problems with my family.	5.30	1.59
9	I have friends with whom I can share my joys and sorrows.	5.41	1.50
10	There is a special person in my life who cares about my feelings.	5.04	1.77
11	My family is willing to help me make decisions.	5.81	1.36
12	I can talk about my problems with my friends.	5.27	1.53
MSPSS Mean Subscales		Mean	SD
Significant Other (Item No. 1, 2,5 &10)		5.06	1.49
Family (Item No. 3, 4, 8 & 11)		5.79	1.23
Friends (Item No. 6, 7, 9 & 12)		5.31	1.33
Total		5.39	1.39

Table 2: Distribution of medical students according to Perceived Social Support level

Variables	Perceived Social Support (PSS) level			χ^2 p value
	Low N=14 (%)	Medium N=104 (%)	High N=267 (%)	
Age (years)				
17-19	00(0.0)	02(1.9)	10(3.7)	$\chi^2= 1.337$ $p=0.855$
20-22	09(64.3)	63(60.6)	158(59.2)	
23-25	05(35.7)	39(37.5)	99(37.1)	
Gender				
Male	08(57.1)	55(52.9)	113(42.3)	$\chi^2=4.130$ $p=0.127$
Female	06(42.9)	49(47.1)	154(57.7)	
MBBS Professional Year				
2nd Prof.	03(21.4)	27(25.9)	90(33.8)	$\chi^2=7.647$ $p=0.265$
3rd Prof. Part I	07(50.0)	40(38.5)	72(26.9)	

Variables	Perceived Social Support (PSS) level			χ ² p value
	Low N=14 (%)	Medium N=104 (%)	High N=267 (%)	
3rd Prof. Part II	03(21.4)	24(23.1)	72(26.9)	
Intern	01(7.1)	13(12.5)	33(12.3)	
Academic Performance				
50-59%	04(3.9)	21(20.1)	71(26.6)	χ ² =10.912
60-69%	08(7.8)	66 (63.5)	180(67.4)	p=0.028*
70% & above	02(1.9)	17(16.3)	16(59.9)	

*p<0.05 is considered significant

Table 3: Pittsburg Sleep Quality Index (PSQI) & Global PSQI Score Means & Standard Deviation

Components of PSQI	Mean	SD
Subjective Sleep Quality	1.06	0.71
Sleep Latency	2.14	1.85
Sleep Duration	1.20	0.89
Habitual Sleep Efficiency	0.71	0.96
Sleep Disturbances	1.11	0.62
Use of Sleep Medication	0.18	0.55
Daytime Dysfunction	1.01	0.86
Global PSQI Score	7.40	4.01

Table 4 : Distribution of medical students according to PSQI global score

Variables	PSQI Global Score		χ ² p value
	≤5 N= 140(%)	>5 N= 245(%)	
Age (years)			
17-19	09(6.4)	03(1.2)	χ ² =9.327
20-22	86(61.4)	144(58.8)	p=0.009*
23-25	45(32.1)	98(40.0)	
Gender			
Male	68(48.6)	108(44.1)	χ ² =0.724
Female	72(51.4)	137(55.9)	p=0.395
MBBS Professional Year			
2nd Prof.	53(37.9)	67(27.3)	χ ² =5.752
3rd Prof. Part I	35(25.0)	84(34.3)	p=0.124
3rd Prof. Part II	36(25.7)	63(25.7)	
Intern	16(11.4)	31(12.7)	
Academic Performance			
50-59%	34(24.3)	62(25.3)	χ ² =1.181
60-69%	96(68.6)	158(64.5)	p=0.554
70% & above	10(7.1)	25(10.2)	

*p<0.05 is considered significant

Table 5 : Pearson correlation between academic performance of medical students, social support and sleep quality

	Social support	Sleep Quality
Academic performance	- 0.060	- 0.037
Social support	-	- 0.163*

* p < 0.05 is considered significant

DISCUSSION

Our study highlights the relation between academic performance and quality of sleep, between academic performance and social support and between quality of sleep and

social support in medical students. Academic performance was not observed to be significantly correlated with social support as well as sleep quality. There was a small

significant negative correlation between quality of sleep and social support.

In the study, we did not observe a significant correlation between age and social support, which is similar to the findings of Zamani-Alavijeh F et al in their study.(10) This might be due to the participants being almost of the same age group. However, Mansourian M et al observed that younger students show lower levels of social support.(11) This difference may be due to the fact that the age groups in our study were not very discreet, with 96.9% respondents between age group 20-25. No significant association of gender with perceived social support was found in the study. There have been studies whose results have been different for both genders. For example, while in studies conducted by Soltani P et al (12) and Zamani-Alavijeh F et al (10) have reported that males have a higher level of social support, studies like Park KH et al (13) and Voltmer E et al (14) reported that females have a higher level of social support than males. Such differences may be related to cultural and temporal contexts. Also, the gender differences seen in the aspect of perceived social support can be attributed to their respective social roles and overall socialization experiences.(15)

Notably, the highest score for perceived social support was from the 'family' sector, calling attention to the role of perceived family support among young individuals. These results have been observed to be consistent with other studies which focus on the significant role of parents. (16,17) The reason for the predominance of family support over friends and significant others can be the fact that the study was carried out in India, which has a collectivistic society. Compared to medical students from western countries,(18) the role of family support has much more importance in Asian cultures. The 'family' sector was followed by 'friends', whose role has also been well established in studies. (19, 20)

No statistically significant correlation was found between perceived social support and academic performance using Pearson's

correlation ($r = - 0.060$, $p = 0.242$). These results are similar to Rospenda et al,(21) who also declined that social support has a buffering effect on the interrelation between psychological distress and academic performance. However, some studies claim the contrary notion that social support does, in fact, affect academic performance. (20, 22) The most probable reason for such a discrepancy can be the fact that these studies focus mainly on 'peer support', which does not play the most significant role in our set-up, with family support taking the front line. Another reason can be the general characteristics of participants. While support from friends plays a key role in the lives of international students, local contacts are a more dominant source of social support among local students. The results may also be extended to support Mackinnon's SP observation in his study that, despite assumptions of its importance, perceived social support has been found to have no effect on future academic performances. (23)

Our study found the mean PSQI score among medical students to be 7.40 ± 4.01 , which is similar to other studies on medical students.(24) The prevalence of poor sleep quality has also been found as high (63.6%), which is similar to studies in other countries like United States (57%), (25) Morocco (58.2%), (26) Pakistan (60%), (27) and Colombia (79.3%). (28) No significant association between gender and sleep quality has been found, consistent with many previous studies.(24,27) However, some studies have reported poorer quality of sleep among females in general.(29,30) The design of this study does not allow deeper insight into these gender discrepancies. Longitudinal studies should be performed to provide a better view of this aspect. Our study showed age and sleep quality were significantly correlated, which has also been observed by Redline S et al. (31)

The present study did not find a significant association between sleep quality and academic performance. This is contrary to the common notion that poor sleep quality has a negative impact on the academic performances of medical students.(28,32,33)

This may be due to the use of class grading as a marker of academic performance in our study, which may vary according to school, subject and teacher. Also, it is consistent with the fact that academic performance is not associated with sleep quality during the semester, as shown in the study conducted by Ahrberg K *et al.*(34) Further studies should be conducted to provide better insight.

We found a statistically significant correlation between sleep quality and social support ($r = -.163$, $p = 0.001$). This is similar to the observation made by de Greys *et al.*(35) in their meta-analysis, that higher level of social support was significantly associated with improved sleep outcomes ($Zr = -.152$) based on random-effects modelling. Xiao H *et al.*(36) and Rambod M *et al.*(37) have also observed in their study significant association between social support and quality of sleep in the healthcare sector. Chung J (38) has further elaborated on the effect of social support and social strain on different parameters of sleep – the association of social support was significant with measures of quality of sleep, while that social strain was significant with sleep efficacy variability, and no significant association was found with total sleep time. Our study reinforces these observations of the effect of social support on sleep quality.

CONCLUSION & RECOMMENDATION

This study has highlighted the negative impact of a lack of perceived social support on the sleep quality of medical students. In line with these findings, professional psychosocial support and interventions aiming to increase perceived social support could be beneficial for improving the quality of sleep of students and their overall well-being on a broader scale. Results also showed evidence of an overall poor quality of sleep in the medical students. To limit the negative outcomes it has on health, regular screening of poor quality of sleep and the establishment of counseling centres focused on promoting good sleep practice are recommended. However, the correlation of both variables with academic performance was not statistically significant, indicating that their levels during the semester

do not have any significant effect the academic performance at the end of the year.

More future research should be encouraged to further explore the domain of perceived social support as it is arising modality with innumerable possible implications.

LIMITATION OF THE STUDY

A few of the important limitations of our study are that, firstly, the study is cross-sectional. The extrapolation of our results should be limited to students who live in their own country and speak the native language, thereby who have local social connections as well. Also, the participants were from a single medical college, which further limits its generalizability. Secondly, the measurement we used to evaluate academic performance is the score in the last professional examination, in the absence of another objective criterion. The scores may be subject to inter-teacher variability. The questionnaire was self-reporting, hence there may be a chance of responder bias. Due to the use of correlation statistics, we cannot provide a definitive comment on causality, as it can go both ways. Last, some personal characteristics such as financial status or chronic medications/personal traits which may affect the variables under question were not considered. Keeping in mind these limitations, more studies are required to further investigate the probable influence of these factors.

RELEVANCE OF THE STUDY

The proposed study shall provide insight into social support as the causative factor of sleep disturbances in medical students. Cross-sectional studies like these that target specific population groups will provide a descriptive account of how these factors affect academic performance. Negative effects of loneliness and sleep deprivation has to be brought forth before not only the students themselves but also their facilitators, be these effects on academics or overall well-being. This study shall form a basis for family, friends, and administration of medical colleges to understand the far bearing consequences of perceived social support and adequate sleep

quality for the students, whereby they can take adequate measures to improve their academic performance.

AUTHORS CONTRIBUTION

JB: Concept, Design, Definition of intellectual content, Data analysis, Manuscript preparation, Manuscript editing, Manuscript review and Guarantor. PK: Concept, Design, Definition of intellectual content, Literature Search, Data acquisition, Data analysis, Manuscript preparation, Manuscript editing, Manuscript review.

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CONFLICT OF INTEREST

There are no conflicts of interest.

DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this work, the authors have not used any AI tools or services.

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