



## ***Impact of Sleep Deprivation on the Educational achievement and Cognitive Function among the Nursing Students***

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### ***Abstract***

**Introduction:** In human wellbeing, sleep plays a very significant function. The low quality of sleep is also a common feature of student life. In addition to the normal sleep time, the amount and consistency of sleep are closely correlated with the students learning skills and educational achievement. Nursing students are subject to high academic standards, which can impact their sleep schedule. Insufficient sleep may impair their mental capacity required for proper academic success with extreme daytime sleepiness.

**Objective:** This research provides an overview of the impact of sleep deprivation in nursing students on educational achievement and functions of cognition.

**Materials and Methods:** A cross-sectional design-A self-structured paper questionnaire was distributed to nursing students from the first year to the final year. For academic results, the grade point average was reported. Nursing students from the University of Lahore were the target population for this study. The sample size was 150. The length of the study was 4 months.

**Results:** 106 (70.7 %) students got less than 6-7 hours of sleep which is less than the recommended sleep, out of 150 respondents. Students with lower GPA had sleep loss related with lower sleep length. Nursing students' cognitive skills, such as memory, focus, concentrating, were also affected.

**Conclusion:** The students who were sleep deficient were low in their educational achievement and cognitive functions. Appropriate sleep is also an important part of improved student success and cognitive performance.

**Keywords:** Sleep deprivation, educational achievement, and cognitive function.

### **I- INTRODUCTION**

Sleep has been one of our fundamental needs, and plays a very significant part in person wellbeing. This is vital to our biological, emotional and cognitive health. Not only does sleep loss make individuals feel exhausted during the day, but it is also a potential health risk to Alzheimer's. Sleep is also an effective, repeated and recurring activity that serves a variety of different purposes, like repairing or development, consolidation of learning or memory, and healing processes. (El Desouky & Awed, 2015)

Sleep is essential for brain function, understanding, decision-making, and logical thoughts, Sleep is therefore important for proper functioning of core brain abilities in higher education related to educational and, probably, public performance. Sleep deficiency and low sleep quality are especially common in young adults and students. Even so, we know that night rest is essential for the maintenance of health, inspiration, intelligence and mental ability, in education area. The brain integrates new information while unconscious and develops latest memories. (El Desouky & Awed, 2015)

Academic performance is the degree to which students have accomplished the long-term or short-term learning objectives. The total academic record (GPA) and also the grades obtained by students indicate their academic achievement in their undergraduate degrees. The cumulative GPA is the measurement, divided by the possible number of points, of the average of all points earned by the respondent. Current data indicates a correlation among GPA and sleep. There were higher GPAs of participant students who sleep

more than 8 hours than the students who sleep less than 6-7 hours. (Kelly, Kelly, & Clanton, 2001)

University students show a slightly lower level of sleep than the general public, with irregular sleep patterns and sleep deprivation. They also suffer from greater sleepiness during the day than the general public. To support proper cognitive processing, students often record slightly less sleep hours per night than typical optimal number for their age category. In order to engage in social and academic activities, students prefer to compromise sleep, leading to continuously shifting sleep schedules and bad sleeping habits. All of these causes, including mood, immune system activity, and even drug misuse, may influence part of the normal university undergraduate life. (Raley, Naber, Cross, & Perlow, 2016)

The purpose of this research is to determine the capacity of the student to succeed academically in response with his or her sleep quality. The significant gap present in studies investigating the association between sleep and educational achievement and functioning, considering the fact that a huge amount of time spent in adolescence is spent on studying and developing schooling. There is still a lack of understanding of very basic changes in sleep hygiene to increase the sleep quality of undergraduates and, consequently, their academic progress. (Shochat, Cohen-Zion, & Tzischinsky, 2014)

Recent research has shown that sleep is essential for memory maintenance and learning. Sleep deficiency induces sleepiness and reduced neurocognitive and psychomotor output. Latest reviews have demonstrated a significant association between sleep habits with learning skills and consistent academic success. Certain sleeping habits have been linked with poor academic success. Late bedtime on weekdays and weekends has been correlated with poor academic results. Sleep deficiency will also result in impaired speech, psychological and neurocognitive. Some sleep experts indicate that adult humans need about 8 hours of sleep a day. (El Desouky & Awed, 2015)

## II-LITERATURE REVIEW

In relation to the effect of poor quality of sleep on educational performance and cognitive function among students, numerous observational studies have been conducted in different countries.

In order to determine the impact of sleep deprivation on educational achievement and functions of cognition among college students, descriptive cross-sectional study conducted at one of the Indian Medical Colleges (n=200), 79 (52.7 percent) students conclude that their educational success is impaired due to lack of sleep, the results of the study showed. 118 students (78.7 percent) believed they were compromised of their sleep as a student. (Rose & Ramanan, 2017)

Another cross-section research carry out at Babylon University, Iraq (n=169) to determine the consistency and

sleep habits of medical college students. The large number of students (62.7 percent) had regular (6) hours of night sleep. Mostly students reported low sleep quality (60.4 percent). Our analysis indicates a strong association between sleep quality and learning capacity and (72.9%) of all those who was fail in at least one subjects with low sleep quality. (Al-Humairi & Sciences, 2018)

A research conducted by Shelley D Hershner and Ronald D Chervin (2014) showed that sleep and depression are interlinked and a central characteristic of depression is sleep deprivation. 108 (72%) of students feel stressed because they have not had enough sleep time for consecutive days in the latest sample of 150 students. During the night of sleep, 48 (32 percent) students felt delusions if they had not enough sleep.

Kelly and colleagues (2001), short sleepers are more likely to be hallucinated at night. 141 (94 per cent) students report depressive moods or behavioral alterations because they have not had enough sleep on consecutive days, and 147 (98 per cent) students have trouble paying attention or focusing classroom lectures due to lack of sleep.

In terms of sleep deprivation and academic success, several studies have been carried out, with most of the results suggesting that sleep deprivation negatively affects students' academic performance.

The Sarbazvatan et al. (2017) survey showed the quality of sleep was an indicator of educational performance, low-sleep students were frequently had low grades.

Orzech et al. (2011) stated clearly that daytime sleepiness results in reduced focus and attentiveness that adversely affects learner knowledge, memory, as well as recalling skills.

Study at the College of Nursing and Allied Health Sciences among female nursing students in Jazan District, Kingdom of Saudi Arabia, Desouky, Lawend and Awed (2015) found that students who had good sleep quality also have good educational performance.

From the study findings of Thomas, McIntosh and Lamar (2016) argued that 98% of the student participants thought that if they got more sleep, they would do better academically.

Among 253 female and 90 male students, Cates, Clark, Woolley and Saunders (2014) tried to determine the sleep standard. The results showed that the rate of bad sleep among students was higher in the lower GPA band. There was no association between gender and the overall standard of sleep.

### **AIMS OF THE STUDY**

The goal of this research was to assess how the poor quality of sleep impacts the academic achievement and cognitive functions of University of Lahore nursing students.

### **SIGNIFICANCE OF THE STUDY**

Sleep has been found to be at the bottom of most individual students' priority list; in fact, they feel they must continuously meet deadlines. The adverse effects of

inadequate sleep on students have been considered by most of the studies already carried out, but there is a need to study and understand how poor educational achievement can influence the sleep cycle and how irregular or incomplete sleeping habits can affect poor academic performance among university undergraduate nursing students. The majority of nursing students are vulnerable young people, whose lifestyle is influenced by their quality of sleep, resulting in a negative impact on their academic achievement.

### III-MATERIALS AND METHODS

#### SETTING

Research had been carried out at the Lahore School of Nursing, University of Lahore.

#### RESEARCH DESIGN

In this research, a cross sectional design was used.

#### POPULATION

The study's target population was undergraduate nursing students from the first year through the final year from University of Lahore.

#### SAMPLING

Convenient sampling technique was used.

#### RESEARCH INSTRUMENT

A self-structured paper questionnaire was distributed to nursing students from the first year through the final year.

#### DATA GATHERING PROCEDURE

The questionnaire was distributed to the participants in printed form where they answered the entire question according to their own understanding. A time of about 30 minutes was given to fill the questionnaires. Then the filled questionnaires were collected.

#### METHODS USED TO ANALYZE DATA

SPSS (version 21) was used for data analysis. Descriptive figures will be given for demographic variables. The frequency and the percentage were determined.

#### STUDY TIMELINE

The research was completed between September 2020 and December 2020.

#### ETHICAL CONSIDERATION

The rules and regulations developed by the Lahore School of Nursing Ethics Committee were enforced when research was done and the interests of research participants were protected. Oral informed consent had been taken from all the participants. All details and data processing was kept secret. Participants were remain anonymous during the entire study. Participants were told that there are no drawbacks or hazards involved with the research process. They were also been told that they had been able to withdraw at any point during the research period.

#### RESULTS

The questionnaire was circulated to 236 nursing students and completed questionnaires were collected from 150 students.

Table 1 show that both male and female genders were included in my research sample. Students were belong to the age between 18 -24 years. Data was collected from the first year to the final year of nursing students.

Table 2 show the grade of the student they have scored in the examinations and the number of students who are sleep deprived according to their GPA. 2 (1.3%) students had a GPA of 3.6-4.0 and they are not sleep deprived. About 34 (22.7%) students had a GPA of 3.1-3.5 out of which 26 students are sleep deprived. 50 (33.3%) had a GPA of 2.6-3.0 out of which 38 students are sleep deprived and about 64 (42.7%) students had a GPA of 1.5-2.5 out of which 54 students are sleep deprived.

**Table 1: Demographic information of 150 students**

Variables	Categories	Frequency	Percentage
Gender	Male	22	14.7%
	Female	128	85.3%
Age	18-19 years	34	22.7%
	20-21 years	80	53.3%
	22-23 years	30	20%
	24 years	6	4%
Educational year	1 <sup>st</sup> year	52	34.7%
	2 <sup>nd</sup> year	37	24.7%
	3 <sup>rd</sup> year	37	24.7%
	4 <sup>th</sup> year	24	16%

**Table 2 : Grade Point Average**

Grade Point Average	No. of students (total no. =150)	No. of students who are sleep deprived	%	No. of students who are not sleep deprived	%
3.6-4.0	2	Nil	Nil	2	1.3%
3.1-3.5	34	26	17.3%	8	5.3%
2.6-3.0	50	38	25.3%	12	8%
1.5-2.5	64	54	36%	10	6.6%

**Table 3: Parameters of sleep deprivation**

Parameters		Frequency	%		Frequency	%
Get sufficient amount of sleep	Yes	38	25.3%	No	112	74.7%
	No					

Regular sleeping hours	Less than 6-7 hours	106	70.7 %	7-8 hours	44	29.3%	Yawning during class hours	Very often	86	57.3 %	Not often	64	42.7%
Time take to fall asleep at night	30 min	94	62.7 %	Less than 10 min	56	37.3%							

Do not sleep well or lack of sleep	Yes		No	
	Frequency	%	Frequency	%
Experience daytime sleepiness	118	78.7%	32	21.3%
Daytime sleepiness affects your academic performance	110	73.3%	40	26.7%
Unable to stay awake or focused during classes	86	57.3%	64	42.7%
Unable to focus during exams	82	54.7%	68	45.3%
Feels less energy or motivation	98	65.3%	52	34.7%
Feels weakened immune system	58	38.7%	92	61.3%
Feeling academic performance is hindered	90	60%	60	40%

Table 4 indicates that 90 (60 %) out of 150 students believe that their academic performance is compromised because of inadequate sleep. 90 students (60 %) believe that due to inadequate sleep, their educational achievement is hindered. 118 students (78.7 %) felt they were deprived of sleep as a nursing student.

Due to lack of sleep	Yes		No	
	Frequency	%	Frequency	%
Memory problems	92	61.3%	58	38.7%
Hallucinations	54	36%	96	64%
Negative mood/ behavioral changes	116	77.3%	34	22.7%
Depression	126	84%	24	16%
Unable to pay attention or to concentrate in the class	130	86.7%	20	13.3%
Feels sleep deprived as a nursing student	118	78.7%	32	21.3%

In Table 5 some questions about cognitive functions were asked by respondents. Thus the lack of sleep had a negative influence on cognitive functions. Students were asked whether as a nursing student, they thought like they were deprived of sleep. 78.7% of students felt that they were deprived of sleep, and 21.3% of students felt that they were not deprived of sleep.

Sleep deprivation has a negative effect on academic performance and cognitive performance. Sleep is thus an integral part of good cognitive function, thereby enhancing academic function.

#### IV-DISCUSSION

The key goal of the research was to figure out the effect of sleep loss in nursing students on educational performance

and cognition skills. Most students get less than the recommended 7-8 hours of sleep each night, the finding revealed. It is important to obtain more than 7 hours of sleep a day for adults.

In this report, 106 (70.7 %) students slept for less than six to seven hours during the night. Researchers have found that there are adverse effects of sleep loss on academic success and wellbeing. Kelly et al. (2001) reported that on weekdays, students who ranked outstanding in education had more sleeping hours. This was followed by our observations that 148 (98.6 %), out of which 118 (78.7 %) were sleep deprived, these were those students whose GPA was < 4. A research found that the students who get more sleep at night had higher GPA than the students who get less sleep.

82 (54.7 %) students out of 150 students were unable to concentrate during exams and had a low GPA. This result is constant with Medeiros et al. (2001) studies among medical students that showed higher scores on exams for students who reported sleeping for longer durations.

In the present report, 94(62.7 %) students need 30 minutes to fall asleep at night, and it takes just 10 minutes for 56(37.3 %) students to fall asleep at night. Due to inadequate sleep, 86 (57.3 %) students yawn very frequently during class hours. During class hours, 64 (42.7 %) students do not yawn often. Therefore it is concluded that most students who get less sleep yawn very frequently during their class time. During the lectures, 86 (57.3 %) students have trouble remaining awake or concentrated, while 64 (42.7 %) students are able to concentrate in the classes. Throughout the day, 98 (65.3 %) students believe that they have less energy or inspiration.

For the learning and memory consolidation, sleep plays an integral role in learning and memory retrieval, thereby helping students to remember information. In the present report, due to inadequate sleep, 92(61.3 %) students had memory issues. The theory that sleep plays an important part in knowledge and thoughts was discussed in a review by Curcio, Ferrara, & De Gennaro, (2006).

A research undertaken by Shelley D Hershner and Ronald D Chervin showed that sleep and depression are interconnected and a cardinal characteristic of stress is disrupted sleep. In the present sample of 150 students, 126 (84 %) students felt depressed for consecutive days they had less sleep. If they had little sleep, 54 (36%) students felt hallucinations at night while sleeping. Short sleepers are more vulnerable to hallucinating at night. When they have consecutive days of inadequate sleep, 116(77.3 %) students experience poor mood or behavioral shifts and 130(86.7 %) students have trouble paying attention or focused lectures in the class due to sleep deprivation.

Many students had impact of sleep deprivation on educational accomplishments and cognitive skills. It was reinforced by a research performed by Pilcher and Walters that found that nursing students are unaware of the degree to which their sleep loss is capable of fulfilling cognitive

duties and maintaining memory and preventing them from educational performance.

Some methods to improve the sleep quality are sleep and wake timetable, making the body get used to a daily cycle of sleep. To ensure that one's bed is comfortable and is used solely for sleeping and not for other things such as reading or watching TV, Conductive Bedroom for a distraction free sleep by keeping it peaceful, dim, comfortable in temperature, a general calming atmosphere. Therefore, students use common spaces and the library, so it can be destructive to successful sleep by using the bed to complete stress-related tasks such as college work. Based on the general appraisal of proper sleep health by the CDC, minimize big meals prior to bed time. By incorporating adequate wellness strategies into the population of nursing students, the issue of sleep loss can be effectively resolved.

### **LIMITATIONS**

1. Less sample size
2. Time was too short
3. This research was performed only at a single university, making it difficult for nursing students from other institutions to generalize their findings.

### **RECOMMENDATIONS**

1. Future studies may improve generalizability and provide more knowledge of the impact of the length and habits of sleep of students.
2. Participants should be asked by future researchers to conduct a cognitive task and compare their findings with their average sleep hours per night.
3. Future study analyzes efficient and appropriate strategies that publicize both sleep awareness and the promotion of safe sleep patterns to nursing students in a time-based and cost-effective method.

### **V-CONCLUSION**

The key goal of the research was to figure out the effect of sleep loss in nursing students on educational performance and cognition skills. It concluded that the most students get less than six to seven hours of recommended sleep each night, the findings concluded. The lack of sleep had a detrimental impact on the academic performance of the students and on cognitive functions such as memory, focus, attention, etc. In order to rise understanding of the value of safe sleep, health promotion campaigns in terms of length and quality of sleep should be promoted in universities. The teachers and university authorities are responsible for recognizing the factors that contribute to poor quality of sleep and for empowering and teaching nursing students about healthy sleep patterns to improve their performance.

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