

Impact of Sleep Deprivation on Academic Performance of Nursing Students at CMH, Lahore

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ABSTRACT

Objective: The objective was to establish a quantifiable link between sleep deprivation and GPA of nursing students.

Study Design: This is a cross sectional, observational analytical study.

Place and duration: It was conducted in CMH Lahore Institute of Nursing for a duration of 4 months.

Methodology: A cross-sectional study was conducted at CMH Medical College, Lahore. A total of 41 willing students were included. After informed verbal consent, a predesigned questionnaire, adopted from similar studies, was used to obtain information regarding individual sleep hours, duty hours, perceptions regarding their sleep patterns and their GPA (academic performance). All the data was collected using Google Forms. The data was analysed using SPSS software.

Results: A total of 41 participants were included in the study. The mean age of these participants was 19.76±0.97 years. Mean GPA was 3.44±0.21. Majority of the students believed that 12-hour shifts negatively impact their attention span in class (87.8 percent) and consequently their study routines (95.1 percent). A cumulative 82.9 percent of the participants felt that they needed more sleep for better patient safety and academic performance.

Conclusion: The mean GPAs, sleep lengths, and wake/sleep times did not vary much within the sample population. However, apparent sleep quality and perceived tiredness varied significantly, with the respondents reporting a grave concern about patient welfare and future academic performance.

Keywords: Sleep, sleep deprivation, GPA, performance.

INTRODUCTION

Quality of life is a multifactorial aggregate, of which one of the most important determinants is sleep. Sleep deprivation, even in seemingly inconsequential amounts, can result in severe mental and physical deficits.¹ It is therefore of serious concern that students in cognitively demanding fields, like nursing and medicine, report higher than average rates of sleep deprivation. Research into this domain is lacking and merited. Our work explores and provides evidence that needs to be reflected upon by relevant authorities to counter the detrimental effects thereof.²

Sleep and cognitive performance are inextricably linked. The state of sleep, erroneously described as inactive, is responsible for memory consolidation, pattern formation and information processing.³ While the individual may be physically inactive, fMRI studies indicate that the brain is buzzing with highly specific, specialised activity.⁴

"Missed" sleep can result in a wide range of systematic illnesses and diseases. It can present with hormonal imbalances, motor problems, and emotional instability.⁵ These factors then compound and result in a marked reduction in academic performance, and quality of life as mentioned earlier. Individuals feel fatigued, confused and sluggish.⁶ Despite adequate motivation, performance decreases and inefficient practices and patterns are adopted as the norm.

According to Pilcher and Huffcutt, sleep deprivation related signs and symptoms materialise after individuals receive less than 5 hours of sleep for 3-4 days in a row.⁷ Multiple isolated instances, if regular, can also result in relative sleep deprivation despite their non-sequential nature.⁸ Demonstrable negative correlations between sleep deprivation and academic performance can be found in other works. The highly cited report by Singleton and Wolfson considered such diverse factors as differences between weekday and weekend bedtimes, among others, to generate a score used to estimate the impact of sleep-related decisions on downstream impacts. This score then directly correlated with diminished GPA scores.⁹

For reasons already alluded to, sleep deprivation is also strongly correlated with altered levels of patient care.¹⁰ In highly sensitive fields like health care, minute errors introduced due to

sleep deprivation can often present disastrous consequences for the patient population. Additionally, nurses are at a substantially elevated risk for sleep deprivation-induced errors as a result of the more hands-on nature of their work, especially when compared to comparable physician populations.¹¹ According to Lockley, et al, attention deficits can lead to 36% more errors and a staggering 300% more errors that lead to patient deaths.¹² It is therefore evident that addressing sleep-related issues as early as possible is of great consequence.¹³

Our work aimed to establish a quantifiable link between sleep deprivation and GPA at CMH Lahore Institute of Nursing.

METHODOLOGY

An observational, cross-sectional study was conducted on nursing students of CMH Institute of Nursing, Lahore. After informed verbal consent was received, a sample of 41 students was enrolled into the study. All the students of nursing were included in the sample because the sample was already small.

Sample Size Inclusion: (convenience sampling, should be a currently studying student of Nursing).

Exclusion: (anything that did not match our inclusion criteria)

A predesigned self-report questionnaire—adapted from similar studies was used to assess sleep-related variables, duty hours and academic performance. Academic performance was assessed through the mean grade point average (GPA) of the students.

The data points were analyzed through SPSS 25 software. Descriptive statistics were presented as mean ± SD for quantitative variables and frequency and percentages for qualitative variables. The structured questionnaire consisted of demographic information of the students—including age and GPA—as well as their duty hours in the hospital, and their sleep quality.

RESULTS

A total of 41 participants were included in the study. The mean age of these participants was 19.76±0.97 years. Mean GPA was 3.44±0.21. Out of total, 18 participants (43.9 percent) believed that they required at least 7 to 8 hours of sleep to feel rested. However,

in practice, only 24.4 percent managed to sleep for this duration. A cumulative 78 percent of the participants felt that they needed more sleep for better academic performance. 95.1 percent of the nursing students reported feeling tired during the duty hours. Table 1 shows a high percentage (73.2 percent) of nursing students believe that sleep deprivation negatively impacts patient safety. Similarly, table 2 and 3 show that the majority of students believed that 12-hour shifts negatively impact their attention span in class (87.8 percent) and consequently their study routines (95.1 percent), respectively.

Table 1: Nursing student perception about sleep deprivation and patient safety

Do you think working 12-hour shifts negatively impacts patient safety?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	11	26.8	26.8	26.8
	Sometimes	15	36.6	36.6	63.4
	Often	8	19.5	19.5	82.9
	Always	7	17.1	17.1	100.0
	Total	41	100.0	100.0	

Table 2: Nursing student perception about sleep deprivation and effect on studies

Do you think working 12-hour shifts negatively impacts your studies?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	2	4.9	4.9	4.9
	Sometimes	13	31.7	31.7	36.6
	Often	8	19.5	19.5	56.1
	Always	18	43.9	43.9	100.0
	Total	41	100.0	100.0	

Table 3: Nursing student perception about sleep deprivation and attention span in class

Do you think working 12-hour shifts negatively impacts your attention span in class?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	5	12.2	12.2	12.2
	Sometimes	8	19.5	19.5	31.7
	Often	10	24.4	24.4	56.1
	Always	18	43.9	43.9	100.0
	Total	41	100.0	100.0	

DISCUSSION

The data generated from our questionnaire was quantified and then analyzed using SPSS for statistically significant results. Several remarkable findings were readily apparent which are elaborated below.

In the tested population, the average GPA was 3.44. This GPA is above average for nursing students across the nation and possibly globally. Additionally, the standard deviation between the GPAs of the tested population is minimal, at 0.21 points. This suggests a high degree of academic concordance between the nursing students, despite significant disparate ages, and educational and socioeconomic backgrounds. This minimal standard deviation, while remarkable on the surface, can be easily explained by a careful appreciation of the day-to-day schedules of the nursing students. Given the fact that the nursing students are Military recruits, their academic performance is inextricably linked to their overall job performance. Poor academic performance can

and is reprimanded severely, with pay cuts and possible terminations frequently arising.

Apparent sleep quality, however, was a clear marker for significantly varying GPAs. Apparent sleep quality is not linked to practical sleep lengths or conditions but is rather a subjective opinion on whether one's attained sleep was satisfactory and conducive to effective performance in day-to-day routines. Those who reported a need for fewer hours of sleep at night had minimal GPA variation between them. However, nurses who reported needing more than 8 hours of sleep presented with significant variations in GPAs, as well as the lowest reported GPAs as a group. Given the strict routines, army nurses are subscribed to, this variation is one with limited practical consequence.

Apparent sleep quality, however, is also associated with a far more crucial variable: job performance. It is common knowledge that decreased sleep length and sleep quality are linked with a diminished ability to perform intellectual challenging activities with precision and accuracy.¹⁴ In a field, as closely associated with the lay population as nursing, even small disturbances in sleep can prove disastrous for patient care and wellbeing, with potential morbid outcomes resulting. It is therefore of extreme worry and concern that nurses across the board reported negative consequences on patient safety regularly. These reports were not limited to, although strongly correlated with, those needing larger amounts of sleep. Policy-makers need to take heed of these reported concerns when it comes to ascribing sleep schedules, for patient care should be at the forefront of any medical policy. Additionally, it is no shock that the same nurses also reported diminished academic performance. While less immediately threatening, academics serve as the obvious foundation for future work performance. Diminished concentrations and learning can lead to unfavorable downstream consequences.¹⁵

Similar works have corroborated the aforementioned findings to a significant extent, in varying population groups. Studies out of Saudi Arabia¹⁶, Egypt¹⁷ and elsewhere have found serious and detrimental after-effects resulting from sleep mismanagement.¹⁸ The work by Mansour K Alzahrani, et al. has reported mismanaged sleep in upwards of 37.9% of the tested population, with significant academic aftereffects.¹⁹

This study, and the associated data, need to be deeply pondered upon by the relevant authorities. It serves as a very valuable insight into the effects of present-day policies concerning officially mandated sleep schedules and structured study routines. If improvements in academic performance, patient safety, and accident reductions are to be made then structural and systematic policy changes need to be brought upon using data-backed research such as this.²⁰

CONCLUSION

In summary, mean GPAs, sleep lengths, and wake/sleep times did not vary much within the sample population. However, apparent sleep quality and perceived tiredness varied significantly, with the respondents reporting a grave concern about patient welfare and future academic performance.

Recommendation: Students should adjust and improve their sleep lengths and quality not only for their own betterment in academics, rather for the patients they are dealing with as well.

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