Excessive Daytime Sleepiness and Sleep Hygiene Practices among Postgraduate Medical Students: A Descriptive Cross-sectional Study

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Abstract

Background

Long work hours, altered schedules, and on-call periods are common practices in postgraduate medical training programs all culminating to poor sleep hygiene practices resulting in sleep loss, disruption of circadian rhythm, fatigue and excessive daytime sleepiness. Simple changes in sleeping habits can have profound impact on the overall health of postgraduate medical students ultimately leading to improved quality of patient care. Hence, the objectives of this study was to find out sleep hygiene practices and the prevalence and severity of excessive day time sleepiness among postgraduate medical students.

Material and methods

A hospital based descriptive, cross-sectional study was conducted among 142 postgraduate medical students at a tertiary care center of Kathmandu for a period of six months. Enumerative sampling was used and the Ethical approval was taken from the Institutional Review Committee. The data collected was analysed using Statistical Package for Social Sciences version 16.

Results

Among the 142 participants, 116 (81.69%; 95% Confidence Interval Confidence Interval (CI): 75.30-88) had maladaptive sleep hygiene practice and excessive daytime sleepiness was present among 50 (35.21%; 95% CI: 27.40-43.10). Among those with excessive daytime sleepiness, mild severity was noticed among 13 (26.00%), moderate severity among 23 (46.00%) and severe severity among 14 (28.00%) of the participants.

Conclusion

In this study majority of the participants engaged in maladaptive sleep hygiene practice and excessive daytime sleepiness was present across all three years of postgraduate training. Majority of the participants had moderate severity of excessive daytime sleepiness.

Keywords

Postgraduate medical students, Sleep hygiene, Excessive daytime sleepiness

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INTRODUCTION

Over the years with modernization of people's lifestyle, sleep disorders and sleep problems have become very common.[1,2] Excessive daytime sleepiness and poor sleep quality are commonly reported among postgraduate medical students.[3,4] Unfortunately, sleep disorders are still a neglected concern among doctors despite being readily treatable. Since sleep plays a vital role in cognitive processes and mood, its disruption can compromise the overall health of doctors which in return can hamper patient care.[5,6,7]

Long work hours, altered schedules, and on-call periods are common practices in residency programs. An interplay between these factors eventually culminates to poor sleep hygiene practices resulting in sleep loss, disruption of circadian rhythm, fatigue and excessive daytime sleepiness (EDS).[8,9] Simple changes in sleeping habits can have profound impact on the overall health of postgraduate medical doctors ultimately leading to improved quality of patient care.

Since there is paucity of published researches among Nepali postgraduate students, the objectives of this study was to study sleep hygiene practices and the prevalence and severity of EDS among postgraduate medical students.

MATERIAL AND METHODS

This was a hospital based observational, cross-sectional

study, conducted among postgraduate medical students in training at Nepal Medical College and Teaching Hospital (NMCTH), over a duration of six months (June 2024 to November 2024) after taking ethical approval from the Institutional Review Board of Nepal Medical College (Reference number: 69-080/081). All postgraduate medical students studying at NMCTH who gave consent were included in this study while those who were pregnant, sick or admitted at a hospital and those who did not give consent were excluded. Informed consent was taken from each participant in written form.

Postgraduate residency training at NMCTH is a three-year long course. Residents across all three years of training were included in this study. The sampling technique used in this study was enumerative sampling. The sample size was calculated using the formula $n = (Z^2 \times p \times q) / e^2$, where the prevalence of excessive daytime sleepiness (p) was taken as 47.40% and margin of error (e) as 10%.10 The sample size was calculated to be 96 but all 142 consenting postgraduate medical students enrolled in NMCTH were included in the study.

Socio-demographic and lifestyle profile data was collected using a proforma. Pretesting of the proforma was done among ten percentage of the calculated study population before sample collection was started. Sleep hygiene practices was assessed using the Sleep Hygiene Index (SHI) while prevalence and severity of EDS was assessed using the Epworth Sleepiness Scale (ESS).The two primary languages used during Postgraduate medical training in Nepal are Nepali and English language. Hence, the tools used in this study was in English language which the participants understood very well.

Sleep Hygiene Index is a self-reported index designed by David F Mastin which is used to assess the presence of sleep hygiene behaviors. It consists of 13 items that are rated on a five-point Likert scale ranging from 1 (never) to 5 (always). The SHI scores can range from 13 to 65 with higher scores indicating poorer sleep hygiene status.[11] For this study, score below 26 was considered as normal/good sleep hygiene, and that above 27 was considered as maladaptive sleep hygiene. Permission to use this tool was taken from the author, Professor David F Mastin via email.

Epworth Sleepiness scale is a self-administered questionnaire developed by Dr. Johns Murray in 1990 to assess daytime sleepiness with eight questions. This study used the 1997 version of ESS in English language. Respondents were asked to rate their usual chances of dozing off or falling asleep while engaged in eight different activities on a four point Likert scale ranging from 0 (would never dose) to 3 (high chance of dosing). The ESS score ranges from 0 to 24. Higher the ESS score, the higher is the person's average sleep propensity in daily life, or their 'daytime sleepiness'. A Score between 0 to 5 was considered as lower normal daytime sleepiness. A score of 6 to 10 was considered as higher normal daytime sleepiness. Lower and higher normal daytime sleepiness was grouped together as normal for this study. Scores between 11 to 12, 13 to 15 and 16 to 24 was considered as mild, moderate and severe excessive daytime sleepiness respectively. The license to use this tool was taken from the Mapi Research Trust on March 2024.[12]

The data was collected mainly during the afternoons or early evenings by distributing hard copies of questionnaires including the proforma and the assessment tools (SHI and ESS) to all 146 postgraduate medical students enrolled at NMCTH during the time of this study at their respective departments. Out 146 only 142 postgraduate students completed the questionnaire. A total of four postgraduate students did not fill the questionnaire out of which three explained they had a busy schedule while one was posted outside the hospital for their duty. The proforma and tools were checked for any missing data and was then entered in Statistical Package for Social Sciences (SPSS) version 16 for statistical analysis. Chi square test was used to assess association between different variables and p value was set at 0.05.

RESULTS

Table 1: Socio-demographic profile of study participants

Variables	Categories	n(%)
Gender	Male	75 (52.82)
	Female	67 (47.18)
Age (years)	25-30	83 (58.45)
	31-35	56 (39.44)
	36-40	2 (1.41)
	>40	1 (0.70)
Marital Status	Single	79 (55.63)
	Married	63 (44.37)
Participants	First year	45 (31.70%)
	Second year	49 (34.50%)
	Third year	48 (33.80%)

Table 1 presents the socio-demographic profile of the participants. Out of 142 postgraduate students 75 (52.82%) were male and 67 (47.18%) were females. The mean age of the sample size was 30.30±2.55 years with 83 (58.54%) participants belonging to the age group of 25-30 years. Of

these, 79 (55.63%) were single and 63 (44.37%) were married. Among the 142 participants, 45 (31.70%) participants belonged to first year, 49 (34.50%) belonged to second year and 48 (33.80%) belonged to third year.

Table 2: Lifestyle profile of study participants

Variables	Categories	n(%)
Tea/coffee (cups per day)	None	29 (20.42)
	1-2	90 (63.38)
	>2	23 (16.20)
Tobacco Smoking	No	122 (85.92)
	Yes	20 (14.08)
Alcohol use	No	102 (71.83)
	1-2/week	37 (26.06)
	>2times/week	3 (2.11)
Physical activity frequency in a week	None	48 (33.80)
	1-3 times/week	81(57.04)
	>4 times/week	13 (9.16)
Refreshing sleep in last week	No	79 (55.63)
	Yes	63 (44.37)

Table 2 presents lifestyle profile of the study participants. Among all the postgraduate students, 90 (63.38%) consumed one to two cups of tea or coffee daily, 20 (14.08%) smoked tobacco and 37 (26.06%) consumed alcohol once or twice a week . Only 13 (9.16%) of the participants engaged in physical activity more than four times a week apart from work, while 48 (33.80%) did not engage in any form of physical activity. Refreshing sleep was reported by 63 (44.37%) of the participants, while 79 (55.63%) reported having non refreshing sleep in the last one week.

Table 3: Overall mean scores of sleep related measures

Variables	Categories
Work hours/week	78.19 (17.65)
Sleep hours/night	6.35 (1.13)
Night duties/month	7.83 (3.91)

Table 3 presents overall mean score of sleep related measure. The mean work hours per week in this study was 78.19±17.65 hours (81.11-75.26 at 95% CI). While the participants slept an average of 6.35±1.13 hours (6.53-6.15 at 95% CI), the mean number of night duties per month was found to be 7.83±3.91 days (8.48-7.18 at 95% CI).

Figure 1: Sleep hygiene practices of postgraduate students

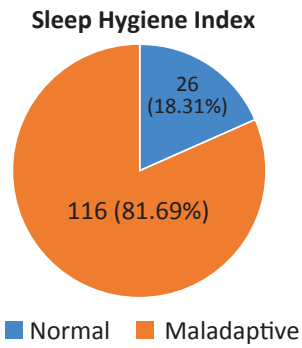

Figure 1 presents sleep hygiene practices of postgraduate students. Maladaptive sleep hygiene practice was present among 116 (81.69%) and normal sleep hygiene practice was present among 26 (18.31%) of the participants.

Figure 2: Prevalence of Excessive daytime sleepiness

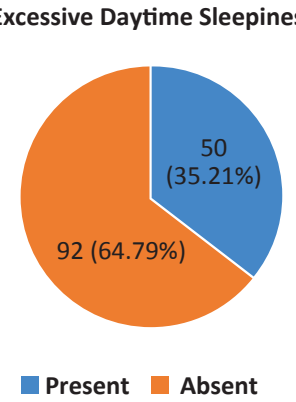

Figure 2 presents prevalence of Excessive daytime sleepiness in this study. EDS was present among 50 (35.21%) out of the 142 participants. Among those with EDS, mild severity of EDS was noticed among 13 (26.00%), moderate severity of EDS was noticed among 23 (46.00%) and severe severity of EDS was noticed among 14 (28.00%) participants.

Table 4: Year wise prevalence of Excessive daytime sleepiness and Sleep hygiene practice

Variables	First year n(%)	Second Year n(%)	Third Year n(%)	p value
EDS				
Yes	20 (44.44)	17(34.69)	13 (27.08)	**0.21**
No	25 (55.56)	32(65.31)	35 (72.92)	
SHI				
Maladaptive	36 (80)	42 (85.71)	38 (79.17)	**0.66**
Good Sleep Hygiene	9(20)	7 (14.29)	10 (20.83)	

Table 4 shows the year wise prevalence of Excessive daytime sleepiness and Sleep hygiene practices across three years of postgraduate training. Excessive daytime sleepiness was found to be highest among first year (44.44%) followed by second year students (34.69%) and was found to be least among third year postgraduates (27.08%).

Maladaptive sleep hygiene was most common among second year postgraduate students and was lowest among third year. The differences in prevalence of EDS and sleep hygiene practices were not significant across three years of postgraduate training.

Table 5: Association between various lifestyle factors and Excessive Day time sleepiness

Variables		EDS		P value
		Present (n)	Absent (n)	
Tea/coffee	Yes	40	73	0.92
	No	10	19	
Tobacco smoking	Yes	4	16	0.12
	No	46	76	
Alcohol use	Yes	15	25	0.72
	No	35	67	
Physical activity	Yes	28	66	0.06
	No	22	26	

Table 5 shows the association between lifestyle factors and excessive daytime sleepiness. No association was found between Excessive daytime sleepiness and any of the lifestyle factors considered in this study.

DISCUSSION

This study shows that maladaptive sleep hygiene practices and sleep disorders such as EDS are also commonly found among Nepali postgraduate students across all three years of residency training. However, the prevalence of EDS in this study was found to be lower than studies conducted in India and Canada.[10,13] In this study EDS was present across all three years of residency but was not significantly different with highest prevalence noticed among first years. Comparable data was found in a similar study conducted in India.[8] This suggests that Nepali postgraduate students are also susceptible to EDS during residency. Majority of those with EDS reported having moderate severity of EDS in this study in contrast to that reported by Mastin DF et al where majority were found having mild severity of EDS.[10] This could suggest that Nepali postgraduate students are more prone to developing higher severity of EDS in comparison to their Indian counterparts. This can be due to the lack of policies that promote healthy working hours, balanced lifestyle and reduced stress related factors at their workplace. Studies have shown fatigue can negatively impact a person's mood, memory, speech and decision making skills.[14,15,16] The presence of EDS across all three years of residency in this study highlights a problem which if continued to be ignored will ultimately impact the health of the treating doctor and patients under their care.

In comparison, the work hours per week was found to be lesser while the average number of duties per month and hours of sleep per night were found to be similar to a study conducted by Siddalingaiah HS et al.[8] The differences in work hours, hours of night time sleep and number of duties could be due to the differences in the number of postgraduate students working at the hospital and the presences or absence of policies that help protect the rights of postgraduate students. Many teaching hospitals globally have taken the opportunity to use this group of doctors as a form of cheap human resource for their own economic growth.[17] In the process of continuing this age old practice, residents struggle with fatigue and sleep deprivation and most definitely compromise their quality of sleep.[10,18,19]

Despite having majority of the participants engage in lifestyle habits that promote good sleep, more than half of the participants in this study reported having non- refreshing sleep in the last one week. In comparison to a similar study conducted among Indian postgraduate students, more than half of the participants reported not engaging in any form of physical activity apart from work and majority of the participants consumed one to two cups of tea or coffee daily. The sleep quality among the participants in this Indian study also reported to be worse across all three years of residency.[8] These similar results suggest that working conditions for postgraduate students are alike even across borders.

Prevalence of maladaptive sleep hygiene in this study was comparable with the prevalence reported by a study conducted by Mastin DF et al using SHI.[10] Sleep plays a vital role in attentive and cognitive process and mood.[6] With disruption of these processes a lapse of judgment may occur which can lead to disastrous consequences such as vehicular accidents and injuries. In the health sector these lapses in judgment ultimately compromise the patient's health.[2] Such alarming prevalence of maladaptive sleep hygiene shows the dire need for immediate reforms in health sector both locally and internationally.

While this study provides useful data it still has its limitations. Since the study was only conducted at one site, the findings cannot be generalized. This study does not take into account comorbid psychiatric conditions that could have influenced the participants sleep patterns. Hence, taking into account the limitations, it is recommended that similar studies be conducted across all medical colleges in Nepal among different group of health workers.

CONCLUSION

For many years residency programs in medical schools have been designed and practiced in ways that rigorously trains postgraduate students to become specialists in their

respective fields however, at the cost of their health. Medical doctors are most often expected to compromise their sleep during patient care and postgraduate training is designed in a way where sleep gets compromised the most. With the continuity of this age-old practice of glorifying doctors' long duty hours with poor sleep, the medical system might be headed towards compromised patient care. This study shows that Nepali postgraduate students are also not immune to maladaptive sleep hygiene practices and EDS hence, emphasizing the need to have policies that safeguard their sleep and overall health.

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CONFLICT OF INTEREST

None

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