

## Original Research Article

# Sleep deprivation and its associated factors among early adolescents in selected schools of Kathmandu Metropolitan City

Shrima Chudal<sup>1</sup>, Maryada Neupane<sup>1\*</sup>, Kushalata Baral<sup>2</sup>, Puja Sharma<sup>1</sup>, Yogesh Poudel<sup>1</sup>

<sup>1</sup>Department of Public Health, Nobel College, Sinamangal, Kathmandu, Nepal

<sup>2</sup>Department of Health Science, Te Huataki Waiora School of Health, The University of Waikato, Hamilton, New Zealand

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### \*Correspondence:

Maryada Neupane,

E-mail: [maryadaneupane305@gmail.com](mailto:maryadaneupane305@gmail.com)

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## ABSTRACT

**Background:** Sleep deprivation is a growing mental health issue that is characterized by a lack of adequate sleep with fatigue and lethargy. It is an increasing concern for early adolescents as they have constant access to the internet and social media nowadays. This research aimed to identify the prevalence of sleep deprivation and its associated factors among early adolescents.

**Methods:** A cross-sectional study was conducted on 329 early adolescents from selected schools in Kathmandu valley. The lottery method was used to select the study area and simple random was used for sample units. A semi-structured questionnaire and face-to-face interview were conducted as a data collection tool and technique. KOBO toolbox and SPSS 25.0 were used for data entry and analysis. Relevant descriptive statistics were computed for all variables and the association was computed using the Chi-square test.

**Results:** Among 329 respondents, 60.2% had poor sleep quality, and 54.7% were dependent upon social media. Sleep quality and social media dependency were positively associated with the gender of the respondent, frequency of checking social media apps per day, use of social media before sleeping and after waking up, duration of social media usage before sleeping, academic performance, and interest in studying.

**Conclusions:** This study showed a significant relationship between social media usage, poor sleep quality, and academic performance. It highlighted a critical need for awareness of sleep deprivation and the psychological effects of excessive social media usage on adolescents in Kathmandu valley.

**Keywords:** Early adolescents, Sleep deprivation, Social media dependency

## INTRODUCTION

Mental health issues include mental disorders, psychosocial disabilities, and other mental states that cause severe distress, difficulty in functioning, or a risk of self-harm. People with mental health disorders are more likely to have poor mental well-being however, this is not always the case.<sup>1</sup> Sleep deprivation is a growing mental health issue that is simply characterized by a lack of adequate sleep along with fatigue and lethargy. A person who is getting too little quality sleep may have several symptoms including fatigue and irritation, mood

changes, difficulty concentrating and remembering, and so on.<sup>2</sup>

Social media today has been a medium of distraction among adults and adolescents. The use of social media has been directly associated with poor mental as well as physical health among adolescents. It has been a very common trend to use social media, especially among early adolescents.<sup>3</sup> A recent study in Nepal has shown a clear association between social media use, excessive screen time with poor sleep quality among adolescents. According to a study, 31% of participants

were found to have poor quality of sleep.<sup>4</sup> Study shows the use of social media platforms such as Instagram is directly associated with poor sleep quality and negative effects on mental well-being, with YouTube being the most favorable influence among early teens.<sup>5</sup>

The main objective of this study was to identify the prevalence of sleep deprivation and its associated factors among early adolescents from the selected schools of Kathmandu metropolitan city.

**METHODS**

School-based cross-sectional descriptive study design was used to conduct this study where all variables were assessed at a single point in time and scales of the measures for numerical variables were nominal, ordinal, and ratio scales. The numerical variables were clubbed into categorical as per the requirement of analysis. The study was done on 329 early adolescent school children of grades 7-9 (13-16 age group) in private schools of Kathmandu metropolitan city.

A simple random sampling technique was used for the selection of schools was simple random sampling technique; the list of private schools situated in our study area was taken from the education department services with an interval of seven. The data collection was carried out in five different schools. The class size proportionate technique was used for the selection of early adolescents where researchers focused on the number of participants per class or school with valid and complete consent from their parents within their school premises as per their comfort and convenient school schedule. The sample size for was calculated using the formula;  $n = Z^2 pq/d^2$ .<sup>6</sup> The study was completed within six weeks of duration i.e., from November 2022 to June 2023.

Respondents were interviewed inside their school premises according to their convenience and class schedules. Semi-structured questionnaires were used and sleep deprivation among the respondents was measured by the Pittsburgh Sleep Quality Index (PSQI) and the use of social media was measured with the help of the social media dependence assessment (SMDI).<sup>7,8</sup> The formal approval was taken from respective schools and concerned authorities. An assent form was made accessible to the respective parents of each respondent who were only involved in the study after their parent's/guardian's formal approval.

**RESULTS**

Sleep deprivation was found significantly associated with the gender of the respondents in this study (p value <0.001) (Table 1).

The association of social media usage with sleep quality was identified in this study. Study variables such as gadget ownership (p value =0.05), social media apps (p value: 0.03), Checking social media per day, and use of social media before sleeping (p value <0.001 were found to be positively associated with the prevalence of sleep deprivation among early adolescents respectively) (Table 2).

The frequent use of social media was strongly associated with the dependence upon social media. Study variables like the use of social media apps (p value <0.001), checking social media per day (p value <0.001), usage of social media after waking up (p value <0.001), and duration of checking social media before sleeping (p value <0.001) were directly associated with social media dependency (Table 3).

**Table 1: Association of gender of the respondents with social media dependence.**

		Social media dependence		P value
		Not dependent (%)	Social media dependent (%)	
<b>Gender of the respondents</b>	Female	14.0	31.9	<0.001*
	Male	31.3	22.2	
	Others	0.0	0.6	

\*Statistically significant

**Table 2: Association of social media use and sleep quality.**

		Sleep quality		P value
		Good sleep (%)	Poor sleep (%)	
<b>Checking social media per day</b>	Time to time	10.30	32.80	<0.001*
	Once or twice	11.90	13.40	
	Only when I get notifications	14.00	9.40	
	Only once	3.60	4.60	
<b>Use of social media before sleeping</b>	Yes	26.70	51.70	<0.001*
	No	13.10	8.50	

\*Statistically significant

**Table 3: Association of social media use and social media dependence.**

		Social media dependence		P value
		Not dependent (%)	Dependent (%)	
<b>Most use form of social media</b>	Facebook	7.60	10.60	<0.001*
	Instagram	5.80	10.00	
	YouTube	25.50	16.10	
	TikTok	4.60	16.70	
	Snapchat	0.60	0.60	
	Others (Discord, Pinterest)	1.20	0.60	
<b>Checking social media per day</b>	Time to time	10.60	32.50	<0.001*
	Once or twice	16.40	8.80	
	Only when I get notifications	14.00	9.40	
	Only once	4.30	4.00	
<b>Duration of using social media before sleeping</b>	less than 1hour	21.50	20.00	<0.001*
	more than 1 hour	5.40	4.20	
	until I fall asleep	5.00	22.70	
	as long as I want	6.20	15.00	
<b>Using of social media after waking up</b>	Yes	14.60	33.70	<0.001*
	No	30.70	21.00	

\*Statistically significant

**Table 4: Association of academic performance and sleep quality.**

		Sleep quality		P value
		Good sleep (%)	Poor sleep (%)	
<b>Interest in studying at home after school</b>	Yes	28.60	32.50	0.001*
	No	11.20	27.70	
<b>Academic performance at school</b>	Excellent	11.60	10.30	0.009
	Satisfactory	26.70	43.80	
	Poor	1.50	6.10	

\*Statistically significant

**Table 5: Association of academic performance with social media dependence.**

		Social media dependence		P value
		Not dependent (%)	Dependent (%)	
<b>Academic performance at school</b>	Excellent	12.80	9.10	<0.001*
	Satisfactory	31.60	38.90	
	Poor	0.90	6.70	
<b>Interest in studying at home after school</b>	Yes	32.50	28.60	<0.001*
	No	12.80	26.10	

\*Statistically significant

Poor academic performance (p value =0.009) and lack of interest in studying at home (p value =0.001) have been linked to poor sleep quality among early adolescents (Table 4). Similarly, Table 5 depicts an additional association of poor academic performance (p value <0.001) and lack of interest in studying (p value <0.001) with social media dependency respectively. Tables 4 and 5 both show that poor sleep quality and the presence of social media dependency are both positively associated with lower academic grades and a decrease in studying time at home.

## DISCUSSION

The results of the study can be compared with some previous research conducted in similar settings. Some similar and contrasting results were obtained from the reviewed works of literature. This study was a cross-sectional descriptive study conducted among 329 respondents to identify the prevalence of sleep deprivation among early adolescents in selected schools of Kathmandu metropolitan city and their association with academic performance, social media dependency, screen time, and sleep quality.

The social media dependency among the respondents was 54.7% in this study which is higher in comparison to a similar study conducted in Nepal.<sup>4</sup> The poor sleep quality of respondents was 60.2% in this study which is higher in another study conducted in a similar setting study in Nepal which may be because of the accessibility and ownership of gadgets among the respondents along with longer usage and dependency on the social platforms.<sup>4</sup> The use of social media among early adolescents is slightly higher in this study (98.8%) than in the previous study.<sup>10</sup> We can assume the COVID-19 pandemic to be a factor influencing the continuous usage of gadgets and the Internet among early adolescents in Nepal. Social media was found to be used maximum for entertainment purposes (84.2%) followed by educational purposes i.e. (75.1%) which is found to be in slight contrast with another study conducted in Nepal.<sup>11</sup> The increasing trend of social media addiction might be the reason for the changing purpose of social media usage nowadays.

Our findings showed a significant association between gender and social media dependence ( $p < 0.001$ ) which was also found to be similar in other studies.<sup>12,13</sup> A significant association was also found between the grades of the respondents and social media dependence ( $p: 0.005$ ) in this study which showed a contradiction in the similar research being studied.<sup>12,14</sup> The increment of the grade comes with more assignments and projects which led to the use of more internet in student life playing a role in securing lower grades academically. The respondents' type of family shows both direct and indirect factors affecting behavioral development in adolescents. A significant association was found between respondents owning at least one gadget and their sleep quality ( $p: 0.05$ ). This association has been identified and supported by similar other studies.<sup>16,17</sup> It was found that the use of social media platforms was associated with sleep quality ( $p: 0.03$ ) which was also supported by a study.<sup>10</sup> A significant association between checking social media and sleep quality ( $p: 0.03$ ) was found in this study which was supported by another study.<sup>12,18</sup> The finding of this study shows a direct association between the use and duration of social media before sleeping and after waking up with sleep quality ( $p: 0.006, 0.003$  respectively) which was also seen in another study.<sup>16,17</sup> Longer duration of screen time consumes more internet content and longer exposure affects psychological behavior altering the sleeping pattern and sleep time among adolescents.

Likewise, the association of frequent checking of social media with social media dependency ( $p < 0.001$  respectively) was found and supported by the previous study as well.<sup>20</sup> Studies suggest that screen time and duration of gadget exposure are the main reasons for sleep deprivation in adolescents. Furthermore, there is a significant association between academic performance and sleep quality ( $p: 0.009$ ) in this study, and has a direct effect on the interest in studying at home after school ( $p: 0.001$ ). This association was also found evident in another study conducted.<sup>12</sup> An association between academic

performance and social media dependence was visible among adolescents which affects the association with the interest in studying at home after school ( $p < 0.001$  respectively). There are similar findings suggested by a study conducted in Iranian medical students.<sup>21</sup> The interest and study patterns along with social media dependence have been a great reason for the dissatisfaction of the students in their academic performance which influences them to the increased prevalence of sleep deprivation. Social media addiction, duration of exposure, satisfaction towards academic performance, and screen time play a huge role in the completion of average sleeping hours in adolescents which later decreases the quality of their sleep.

The limitation of the study was the unavailability of generalization into a large population as the study was focused on the 13-16 age group of private schools inside Kathmandu metropolitan city. There would be a possibility of responder bias as the questionnaire was self-administrative design. To address this limitation, researchers should try recruiting participants from a more diverse and representative sample, such as those from different school settings, different age populations, and larger geographical areas. Additionally, this study provides the baseline information for further studies on the related field by researchers.

## CONCLUSION

The prevalence of poor sleep quality was found to be slightly higher compared to other studies conducted in a similar setting. The social media dependency among the respondents was higher than that of the previous study. Additionally, there was a significant association of sleep quality with the gender, grade, and family type of the respondents in the current study. Gadget dependency, social media exposure, social media usage, purpose of social media use, academic interest, and satisfaction with academic performance played a pivotal role in the prevalence of sleep deprivation and social media addiction in adolescents.

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