# **Original Research Article**

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20175814

# A study of mobile phone usage on sleep disturbance, stress and academic performance among medical students in Tamil Nadu

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Received: 23 November 2017 Revised: 13 December 2017 Accepted: 15 December 2017

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# ABSTRACT

**Background:** Today's world has led students to mobile phone as a mode of communication and social networking. This also has bought about psychological dependency towards mobile phones which causes sleep deprivation and increased stress affecting them academically. However, very few studies were conducted among medical students. Hence, this study was attempted with an objective to assess the effect of mobile phone usage on sleep disturbance, stress and academic performance among under graduate medical students.

**Methods:** An observational Study was conducted among under graduate medical students in KIMS, Tamil Nadu, during September to November 2016. Among first to final year students 203 were selected by simple random sampling. Data were collected after obtaining the consent using a self administered questionnaire, containing demographic details, variables on mobile usages, PSQI and PSS scales. Mean, median, standard deviation and percentages were calculated; Chi square test and correlation coefficient were calculated at 5% level of significance.

**Results:** Among 203 study participants everyone had smart phones which were used for communication and social media. The hours of usage of mobile ranged from 5 minutes to 10 hours per day. Most of them (61%) used during night hours, 72.4% of the study participants had poor sleep quality, 66.5% had moderate stress, 14.8% had severe stress. There was significant association of poor sleep quality and academic performance with mobile phone usage (p<0.01).

Conclusions: There is an association of mobile phone usage with sleep quality and academic performance.

Keywords: Mobile usage, Sleep deprivation, Stress, PSQI, PSS

# **INTRODUCTION**

Mobile phone usage has become indispensible, especially among the youngsters. This has brought about psychological dependency towards mobile phones leading to addiction in them.<sup>1</sup> Excessive use of mobile phones is known to be associated with head ache, ear ache, warmth sensations and also perceived concentration difficulties.<sup>1-4</sup> There are also various studies which have showed that the majority of mobile uses suffer from sleep deprivation and increased stress affecting their cognitive and learning abilities.<sup>5,6</sup> The mobile phone dependent students also become academically stressed out. However, there are very few studies conducted among medical students regarding mobile phone usage and their influence on sleep disturbance, stress and academic performance. Hence, this study was attempted with an objective to assess the effect of mobile phone usage on sleep disturbance, stress and academic performance among under graduate medical students in Tamil Nadu.

### **METHODS**

An observational Study was conducted among under graduate medical students, Karpaga Vinayaga Institute of Sciences Medical and Research Center, Madhuranthakam, Kanchipuram District, Tamilnadu during September to November 2016. Assuming the prevalence of 53% and absolute precision 7%, the sample size was found to be 203 and the study subjects were selected by simple random sampling method.<sup>1</sup> After obtaining an informed written consent, a self administered questionnaire consisting of demographic details, PSQI scale, PSS Scale, Mobile model, hours and purpose of usage and academic performance were administered.

The Pittsburgh sleep quality index (PSQI) is an effective instrument used to measure the quality and patterns of sleep in the older adult. It differentiates "poor" from "good" sleep by measuring seven domains: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction over the last month.<sup>7</sup> The client self rates each of these seven areas of sleep. Scoring of the answers is based on a 0 to 3 scale, whereby 3 reflect the negative extreme on the Likert scale. A global sum of "5" or greater indicates a "poor" sleeper.<sup>7</sup>

The perceived stress scale (PSS) is the most widely used psychological instrument for measuring the perception of stress.<sup>8</sup> It is a measure of the degree to which situations in one's life are appraised as stressful. Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. The items are easy to understand, and the response alternatives are simple to grasp. Moreover, the questions are of a general nature and hence are relatively free of content specific to any subpopulation group.<sup>8</sup>

#### Statistical analysis

Data was recorded in MS Excel sheet, analyzed using statistical software SPSS version 20. Mean, Median, Standard Deviation and Percentages were calculated. Chi square test and Correlation coefficient were calculated to find the association between the variables at 5% level of significance.

## RESULTS

The study participant's age ranged from 18 years to 23 years. There were 82 (40.4%) males and 121 (59.6%) females. Median hour of mobile usage was 2 hours and it ranged from 5 minutes to 7 hours. Majority of them 122 (60.1%) were using mobile phone in evening and night hours 125 (61.5%) and we observed that there was increasing trend in mobile usage over year of study (Table 1).

#### Table 1: Frequently mobile used time n(%).

Frequently used*	I (n=53)	II (n=50)	III (n=50)	IV (n=50)	Total (n=203)
Morning	1 (1.9)	1 (2)	2 (4)	1 (2)	5 (2.5)
Afternoon	1 (1.9)	1 (2)	2 (4)	4 (8)	8 (3.9)
Evening	28 (52.8)	32 (64)	27 (54)	35 (70)	122 (60.1)
Night	33 (62.3)	34 (68)	34 (68)	24 (48)	125 (61.5)

Duration of mobile p	Chi square	D Voluo		
$\leq 2$ hours n(%)	>2 hours n(%)	Total	value	
35 (34.3)	21 (20.8)	56	1.65	0.03*
67 (65.7)	80 (79.2)	147	4.03	
22 (21.5)	16 (15.7)	38		
64 (62.8)	71 (70.4)	135	1.44	0.4
16 (15.7)	14 (13.9)	30		
	Duration of mobile p ≤2 hours n(%) 35 (34.3) 67 (65.7) 22 (21.5) 64 (62.8) 16 (15.7)	Duration of mobile phone usage           ≤2 hours n(%)         >2 hours n(%)           35 (34.3)         21 (20.8)           67 (65.7)         80 (79.2)           22 (21.5)         16 (15.7)           64 (62.8)         71 (70.4)           16 (15.7)         14 (13.9)	Duration of mobile phone usage $\leq 2$ hours n(%)>2 hours n(%)Total35 (34.3)21 (20.8)5667 (65.7)80 (79.2)14722 (21.5)16 (15.7)3864 (62.8)71 (70.4)13516 (15.7)14 (13.9)30	$\begin{tabular}{ c c c c } \hline Duration of mobile phone usage & Chi square \\ \hline \leq 2 hours n(\%) &> 2 hours n(\%) & Total & value \\ \hline & & & & & \\ \hline & & & & \\ \hline & & & & \\ \hline & & & &$

\*Statistically significant.

Purpose of using mobile was depicted in Figure 1 as pie diagram. All of them used mobile as a mode of communication followed by social media 135 (66.5%), but only 64 (31.5%) of them were using for academic purposes.

Table 2 explains that there was significant association of duration of mobile usage with sleep quality. 79.2% were

having poor sleep when they use more than 2 hours/day as compared to 65.7% who had poor sleep when they use 1 or 2 hours/day (p=0.03). Our study did not show statistically significant association of mobile usage with stress level. However, we observed that among those who used mobile more than 2 hours/day, 70.4% had moderate stress.

Mabila phone users	Academic perform	Chi square	Devolue		
Mobile phone usage	<60%	≥ <b>60%</b>	Total	value	r value
≥2 hours	82	20	102	35.21	0.0001*
<2 hours	40	61	101		
Total	122	81	203		

#### Table 3: Association of sleep disturbance with stress level.

\*statistically significant.

Table 3 describes that there is significant association between mobile phone usage with academic performance (p=0.0001). Nearly 80% the students who were using mobile phone more than 2 hours got poor academic performance. We also observed that there was a decreasing trend of getting marks over the years.

In this study we also found that there was a significant positive correlation between sleep quality with academic performance ( $\rho$ =35.4%, p=0.001); similarly it was revealed that there was 36.8% positive correlation between stress level and academic performance.



Figure 1: Purpose of mobile phone usage.

#### DISCUSSION

In our study the average use of mobile phone was 2 hours per day which was lesser than study done by Abhishek et al. in which, average daily use was 6 hours and they were using mainly for social networking, followed by playing games, listening to music and for academic purpose Majority of them in our study regularly used smart phone at late night which was similar to all other studies.<sup>3,4,10</sup> Another study by Anju et al, explored nearly 72% of were using the cell phone for less than 2 hrs in a day and very few of them were aware of the protective measures.<sup>5</sup>

This study showed that there was a significant correlation between increased mobile phone usage and sleep disturbance which was supported a study by Gupta et al, where it was revealed that 76.4% students were using smart phones in night time. They also found an association of night time phone usage and time spent on mobile phones with decline in study habits, difficulty in concentration, increase in missed classes, and going late for classes.<sup>5</sup>

Deepali et al showed that there was a significant relationship between increased mobile phone usage and stress among  $1^{st}$  yr medical students. However, in our study we did not find an association of mobile usage with stress<sup>1</sup>. Some of the studies, few study subjects felt lack of concentration during study hours due to urge for using phones very often.<sup>5,11</sup> Another study by Rupani et al, showed 38.7% of study subjects feel distressed by thought of being without their mobile phone use.<sup>6</sup>

A study by Abdulghani et al, had revealed that sleep deprivation reduced cortisol level which lead to stress. This is further supported by our study which showed that poor sleep quality and increased sleep latency significantly increased the stress levels among students.<sup>3,4</sup> In our study, it was observed that increased stress level and poor sleep quality had significant correlation with poor academic performance. Balaji et al found that 64.3% of study participants in his study had experienced health problems like headache, sleep disturbance, ear pain and irritability. He explored that the young students had become addictive towards the mobile phone usage despite development of health problems and poor academic performance.<sup>12</sup> Our study had some limitations. The study was conducted in one medical college. However, results of this study add to the existing evidence.

#### CONCLUSION

There is an association of mobile phone usage on sleep deprivation and academic performance. We should motivate the students to get themselves engage in cocurricular activities. Interventions to limit mobile phone usage at college level and counseling to alleviate stress levels and sleep deprivation can be undertaken.

Funding: No funding sources

Conflict of interest: None declared

*Ethical approval: The study was approved by the Institutional Ethics Committee* 

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**Cite this article as:** Gladius JH, Sowmiya K, Vidya DC, Archana LPA, William RF. A study of mobile phone usage on sleep disturbance, stress and academic performance among medical students in Tamil Nadu. Int J Community Med Public Health 2018;5:365-8.