



Physiology

EFFECT OF SMART PHONE ADDICTION ON SLEEP QUALITY AMONG 1ST YEAR MEDICAL STUDENTS OF PRIVATE INSTITUTION IN KERALA – A CROSS SECTIONAL STUDY

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ABSTRACT

Introduction: Smartphone is an indispensable and unavoidable gadget in the hands of global netizens. Studies have shown that college students are most vulnerable to smartphone addiction (SA) compared to older adults and its overuse can cause poor sleep quality which may affect the memory, decision-creating, learning, and concentration level of students. **Methodology (Materials and Methods):** A crosssectional questionnaire based study was done on 254 first year medical students of Malabar medical college, Modakkallur, Calicut after obtaining a written consent. **RESULTS:** Majority of the students regardless of gender started using cell phones after the age of 16 and right before sleep. Even though there was mobile addiction and impaired sleep in both male and female students, there was a male predominance in the current study. **Conclusion:** This study shows the effect of mobile phone addiction on the sleep quality of the students.

KEYWORDS : Smartphone addiction, sleep quality, gadget, students**INTRODUCTION**

Smartphones are handheld mobile devices with many convenient features and software applications (email, social media, web browser, etc.), which are operated via an Internet connection. The first smartphone was produced in 1992, but the term "smartphone" was designated in 1995, when smartphone functions evolved to include more than communications. Currently, smartphones provide entertainment, social media, health monitoring, productivity, utility functions (e.g., day planners), text talk, photo editing, and many more features in one handheld device. (1)

The 'ICUBE 2020' report by IAMA and Kantar indicates that the Internet usage in India continues to grow. As of 2020, estimated number of Internet users who have accessed Internet in the last one month is around 622 million. The number of active internet users are expected to grow and reach 900 plus million by 2025. (2)

The excessive use of smartphones and internet has been known to cause a variety of physical symptoms such as pain in neck and hands as well as psychological problems such as insomnia, depression, anxiety, and stress. Studies have shown that college students are most vulnerable to internet addiction (IA) and smartphone addiction (SA) compared to older adults.

Sleep quality has significant impacts on cognitive ability and physical strength, and the consequences of poor sleep quality are also serious, such as depression, impaired work performance, motor vehicle accidents, and poor overall quality of life

Poor sleep quality caused by excessive use of smartphones may affect the memory, decision-creating, learning, and concentration level of students.

Rationale Of Study

Smartphones in the recent years have become an essential commodity to an individual. An individual uses it for their job, education and also for entertainment purposes. The overuse of these devices go unnoticed until it starts to interfere with the health and welfare of the person.

In the present questionnaire based study, an effort has been made to understand the perception and effect of smartphone usage on the sleep quality among the first year medical and dental students.

METHODOLOGY (Materials and Methods)

- Research question : Does smart phone addiction affect sleep quality among first year medical and dental students
- Aim and Objectives :
To determine the impact of smart phone addiction on the sleep quality among 1st year medical and dental students

- Hypothesis : Increased screen time affects the sleep quality of students
- Study design : Cross-sectional study
- Setting : Department of Physiology, 5th floor, Academic Block, Malabar Medical College, Modakkallur
- Sample size : $n = \frac{Z^2pq}{d^2}$

$$z_{\alpha} = 1.96$$

$$p = 33.33\% (\text{based on prevalence in the study by Surobhi et.al}) (7)$$

$$q = 100 - p = 66.6\%$$

$$d = 8\% (\text{Absolute precision})$$

$$n = \frac{(1.96)^2 \times 33.33 \times 66.67}{(8)^2}$$

$$n = 133$$

- Inclusion criteria : First year medical students of Malabar medical college and first year dental students of Sree Anjaneya Institute of Medical Sciences with a smart phone who consent for the study
- Exclusion criteria : Students with a history of psychiatric/ neurological disorders, students with history of insomnia
- Sampling Procedure :
The participants would be selected based on the inclusion and exclusion criteria
- A consent page would be provided in the beginning of the questionnaire, which explains the details of the study and the purpose for which the information provided by the participants would be used.

Methods Including :**Method of Data Collection :**

A questionnaire which includes demographic profile and validated scales would be administered as handouts to 1st year medical and dental students who come to the Department of Physiology for their practical classes

- Consent form (Annexure I)
- Semi structured questionnaire to assess the demographic profile and the pattern of smartphone use (age of commencement of use, right before sleeping at night) (Annexure II)
- Validated Scales (Annexure III)
 - Smartphone Addiction Scale-Short Version (SAS-SV)
 - The SAS-SV scale comprises of ten questions with a 6-point Likert scale.
 - It addresses the following five domains:
 - daily-life disturbance
 - withdrawal
 - cyberspace oriented relationship
 - overuse and
 - tolerance.
 - A score of ≥ 31 in Male students and ≥ 33 in female students is considered significant
 - It has acceptable measures of reliability (Cronbach's alpha 0.911)

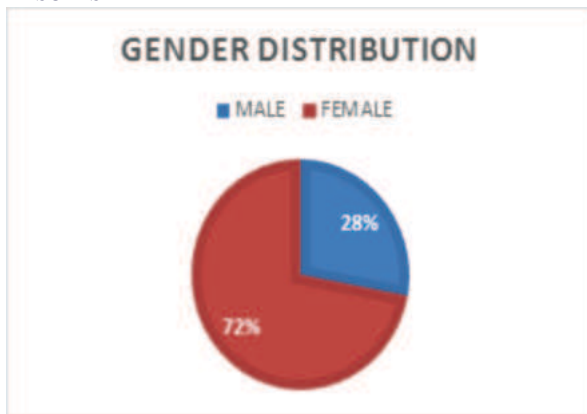
and validity.

- b) Pittsburgh Sleep Quality Index (PSQI)
- The PSQI is a self-administered scale which contains 9 questions related to the previous month's sleep patterns.
 - This questionnaire has seven components that measure the different aspects of sleep (C1-Subjective sleep quality, C2-Sleep latency, C3-Sleep duration, C4-Habitual efficacy, C5-Sleep disturbances, C6-Use of sleep medication, C7-Daytime dysfunction).
 - It has a minimum score of "zero" and a maximum score of "21" with "five" as a cut-off value for impaired sleep.
 - It has acceptable measures of reliability (Cronbach's alpha 0.83) and validity.

Statistical Analysis

Data entered in MS EXCEL and Statistical analysis done using the SPSS software version 21.0. Numerical values expressed as mean and standard deviation & categorical values expressed as frequency and percentages. Chi square / fishers exact test analysis was done for analyzing the association . P value < 0.05 will be considered as statistical significance

RESULTS



Among the participants, 26.8% of them started using mobile phones before the age of 16 and 73.2% after the age of 16.

Those who started using mobile phones before 16 years of age had significant higher SASV scores than who started using after 16 years.

There was not much difference in the PQSI scores when age was considered.

Among the participants, 91.3% used mobile phone right before sleep and 8.7% did not use mobile phones right before sleeping

There was no significance of the use of mobile phone right before sleeping and SASV scores in both the participants while the use of mobile phone right before sleeping and PQSI scores were significant with males 59.9% and females 77.3% who have impaired sleep due to the mobile phone use right before sleeping with overall percentage of 61.4%

Table 1 : Comparison Of SASV Score In Male And Female Participants

			SASSV SCORE MALE		Total
			1.0	2.0	
sex	1.0	Count	34	37	71
		% within sex	47.9%	52.1%	100.0%
	2.0	Count	66	117	183
		% within sex	36.1%	63.9%	100.0%
Total		Count	100	154	254
		% within sex	39.4%	60.6%	100.0%

SASV score in males, 47.9% had smart phone addiction while 52.1% did not have smart phone addiction.

SASV scores in females, 36.1% had smart phone addiction while 63.9% did not have smart phone addiction.

Overall 39.4% had significant SASV scores and remaining 60.6% had non significant scores

Table 2 : Comparison Of PQSI Scores In Male And Female Participants

			PQSI SCORE		Total
			1.0	2.0	
sex	1.0	Count	49	22	71
		% within sex	69.0%	31.0%	100.0%
	2.0	Count	107	76	183
		% within sex	58.5%	41.5%	100.0%
Total		Count	156	98	254
		% within sex	61.4%	38.6%	100.0%

PQSI score in males, 69% had impaired sleep ,while 31% had adequate sleep

PQSI score in females, 58.5% had impaired sleep, 41.5% had adequate sleep.

Overall,61.4% had impaired sleep ,while 38.6% had adequate sleep

Table 3 : Comparison Of SASV Score And PQSI Score In Male And Female Participants

			PQSI SCORE		Chi square value	P value	Sig.
			normal	abnormal			
male	SASSV SCORE	normal	24	10	0.076	0.803	> 0.05, no sig
		abnormal	25	12			
fe- male	SASSV SCORE	normal	44	22	2.856	0.11	> 0.05, no sig
		abnormal	63	54			

DISCUSSION

Our study population consists of medical students from first phase of MBBS.

Among the students we found that majority of the students started using mobile phones after the age of 16.

Those who used mobile phones before the age of 16 had higher SASV score.

Majority of the students used mobile phones right before sleep which was similar to the study conducted by Alshobaili .et.al were 75% of the young adults (age < 30 years) took their smart phones to bed which increased the likelihood of poor sleep quality (3) and more female students had disturbed sleep compared to male students similar findings were seen in the study conducted by Fahad et.al. (2016). (4)

Male students had more smartphone addiction based on SASV and PQSI scores compared with female students.

Higher smartphone addiction rates lead to more time spent on smartphones at night, thereby impairing sleep quality.

This positive correlation between PSQI and SASSV scores was also published in several other Indian studies (M. Prasad et al., 2017; S. Prasad et al., 2018).(5)

The overall smartphone addiction among students was 39.4% was higher than that in previous studies conducted in South Korea (6) and in Western Europe (7,8) and poor sleep quality was 61.4%. (9)

Limitation of the Study

The absence of a scale to measure daytime sleepiness which could have provided an insight into the problems in functionality due to poor sleep.

Correlation of the SASAV and PQSI scores with the academic performance could have provided inputs on the functioning of medical students.

The reliability of the answers to the questionnaire by the students can be scrutinized

CONCLUSION

Smartphone addiction is something that is constantly being reported in the medical literature and hence warrants the assessment of its prevalence in the population, especially in college students. Nearly half of the medical students were found to have smartphone addiction more so in the male population although no significant gender difference could be made out. Smartphone addiction was found to be associated with poor sleep quality only in a minority in the current study.

Results from a small sample size comprising of university students cannot be generalized with respect to general population

The study needs replication in a larger and more heterogeneous population.

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