

Excessive Use of Mobile Phones by Medical Students: Should Precautions be Taken?

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ABSTRACT

Smart mobile phone usage is rapidly increasing among the students in colleges. Many new symptoms have emerged such as mobile phone addiction, nomophobia and ringxiety among users. The objective of this study was to study the prevalence of mobile phone use by medical students in a medical college in Oman and to see if the students were using their mobile phones safely. A questionnaire was constructed to get basic knowledge about the use of smart phone by the college students. 129 students responded, results showed that 100% of the students were using a mobile device, 50% of the students, who were mostly females, were using internet via WiFi on their mobile for more than 4 hours per day, and majority (83%) were using headphones. During lectures, 85% kept mobile phone 'on', 65% sent messages, 20% even played games and 7% received or made calls. While sleeping, 70% did not switch off their phones, 33% kept it under their pillow and 60% on a side table. When asked if their parents limit the use of their phone, 83% say no. 90% of the students were aware of the fact that mobile phones electromagnetic waves may cause health problem. We conclude that there is excessive usage of mobile phone among the medical students and more safety measures need to be introduced. It is time to make new rules and policies regulating its use in the campus to avoid adverse effects.

Keywords: Mobile phone, Electromagnetic waves, College student.

INTRODUCTION

It has been noticed that college students are spending excessive time on smart phones. Most of the students can be seen holding a smart phone in their hand while attending lectures or doing other activity during the college study hours. Many researchers have reported 'mobile

phone addiction' referring to such symptoms as 'nomophobia and ringxiety'^{1,2,3}. This compulsive behavior is comparable to compulsive gambling and video gaming which have physical and psychological withdrawal symptoms like anxiety, restlessness and irritability⁴. Other symptoms such as headaches, earache, warm sensations, concentration difficulties and fatigue have also been reported^{5,6}. Another



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new term ‘nomophobia’, an abbreviation for “No-mobile-phone-phobia” was introduced by the UK post Office in 2010, which meant keeping the device in reach while sleeping and never turned off, looking at the phone screen frequently to avoid missing any messages, phone calls or notifications, which is referred to as ringxiety ⁷. Ritu described the terminology “textaphrenia”, “textiety” “post-traumatic text disorder” and binge texting as newly developing disorders related to smart phone use ⁸.

Social networks such as Facebook, WhatsApp, Instagram, and twitter, installed on smart phones are contributing to mobile phone addiction. Facebook has more than 1.44 billion users in the beginning of 2015, WhatsApp around 800 million with 82% of adolescents and young adults using these social networks regularly ⁹.

Mobile phones use non-ionizing low radio frequency electromagnetic waves (REW). It causes DNA damage¹⁰, affecting genes, membrane function and signal transduction ^{11,12,13}. Functions of the central nervous system, permeability of the blood brain barrier ¹⁴ and melatonin synthesis ¹⁵ are also affected. REW exposure increases free-radical production which causes metabolic, immunological

and carcinogenic effects ^{17,18}. Symptoms such as headaches, sleep disturbances, lack of concentration, dizziness, memory loss, and increased risk of cancer were first reported as “Microwave sickness” in 1978 ¹⁹, which are now linked to the base stations in the vicinity of residential areas and excessive use of mobile phones. Childhood leukemia in children exposed to extremely low frequency (ELF) magnetic fields has already led to its inclusion as a “possible human carcinogen” by the International Agency for Research on Cancer, published in “Agents Classified by the *IARC Monographs*”, Volumes1–109. (<http://monographs.iarc.fr/ENG/Classification/ClassificationsAlphaOrder.pdf>). Recently an increase incidence of thyroid cancer in South Korea and gliomas in Sweden have been reported which could be due to excessive use of mobile phones ^{20,21}.

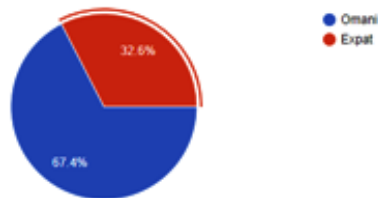
There has been increasing concern of the rising use of mobile phones by the young adults.

Hypothesis

Our hypothesis is that our medical students use mobile phone excessively during and after college working hours.

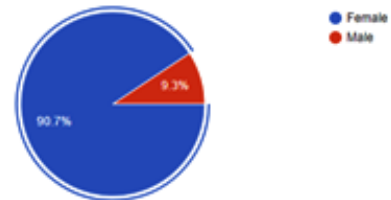
Nationality

129 responses



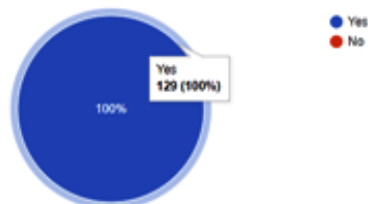
Gender

129 responses



Are you using a mobile?

129 responses



How many hours do you use mobile data downloading/wifi internet per day?

129 responses

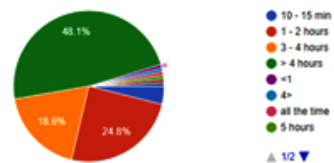


Fig. 1: Prevalence of mobile phone use at Oman medical College and demographic data

Objective

To determine the prevalence of mobile phone use by medical college students at Oman Medical College during and after college hours in Sultanate of Oman, and to investigate the ways mobile phones are being used.

MATERIALS AND METHODS

This study was approved by the ethical committee of Oman Medical College and is part of an internal grant by Oman Medical College to study the prevalence of mobile phone use in schools and colleges in North Al Batinah region of Oman. It is also approved by the Ministry of Health and Ministry of Education, Sultanate of Oman.

This is a cross-sectional type of observational study. A questionnaire (English and Arabic) was constructed on google forms and was sent to the students of year 2,3,4, and 5 (pre-med and pre-clinical students). Data was collected and analyzed using SPSS software. The different variables were presented, compared and analyzed using independent t test. A p value of < 0.05 was considered significant.

RESULTS

129 students from classes 2nd, 3rd, 4th and 5th years at Oman Medical College responded to the questionnaire. The age ranged from 17-24 years; 90.7% females. The results showed that 100% of the students were using a smart phone mobile device. Almost 50% of the students who were mostly females were using internet and WiFi on mobile for more than 4 hours per day, 87% using headphones (Fig.1).

Mobile phone use during class

When asked if they were turning the mobile device off during lectures, 85% reported no, 65% sent or received messages, 20% played games and 7% received or made a call during lectures (Fig.2). The ways the students used the smart phone is shown in Fig.3.

Mobile phone use during sleeping hours

When asked if they switch off the mobile when sleeping, 70% said no, 33% kept it under the pillow and 60% on a side table (Fig4).

Keeping the mobile phone when outdoors

Majority of the female students kept their

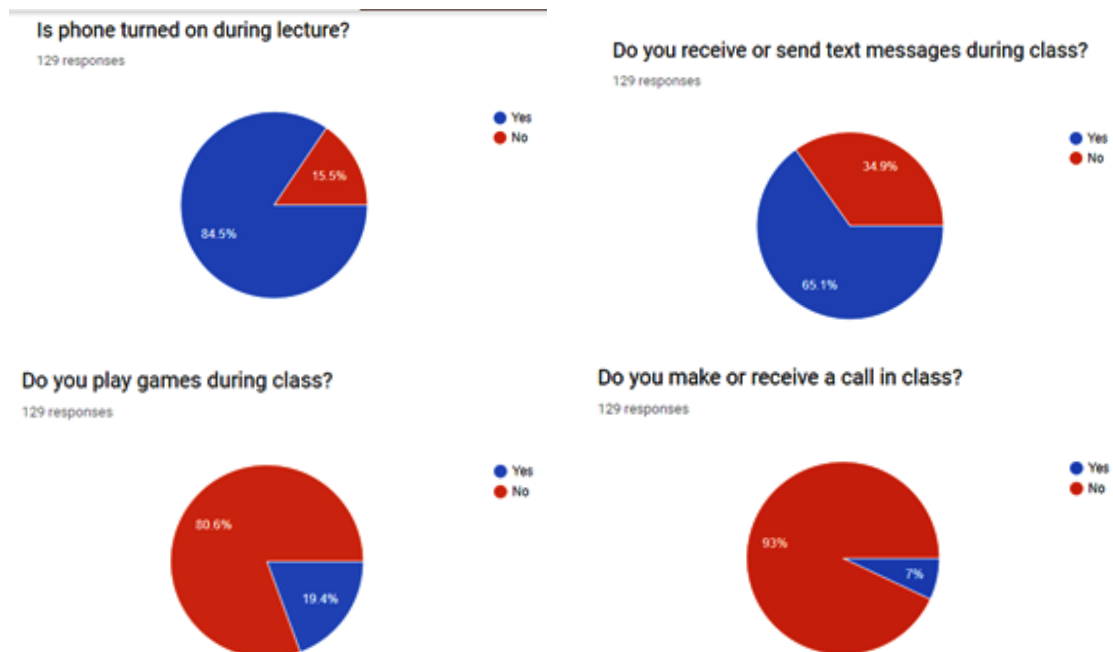


Fig. 2: Use of mobile phone during the classes

mobile phones in their hand or purse while boys kept it in their front pocket (Fig.5).

mobile phone electromagnetic waves may cause health problems (Fig.7).

Parents limiting use of mobile phone

When asked if their parents limit the use of mobile phone, 83% say no (Fig.6).

Knowledge of electromagnetic waves hazards

90% say yes when asked if they know that

DISCUSSION

Prevalence of mobile phone use by young adults is more than 90% and the use in Oman is ranked 10th in the world ^{22,23} (after Saudi Arabia, Russia, Kuwait and Panama, WHO health statistics

If Yes:

86 responses

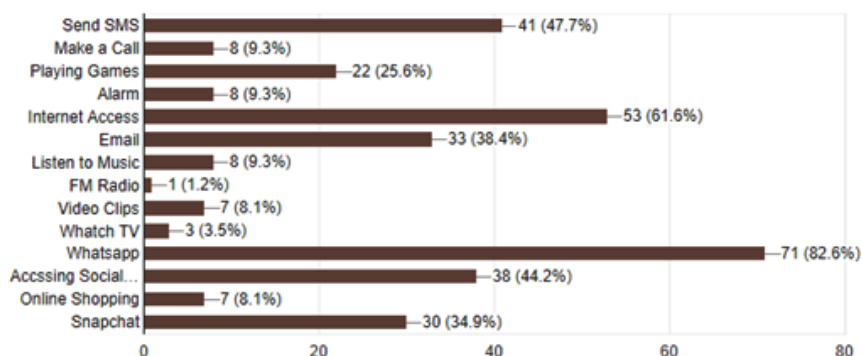
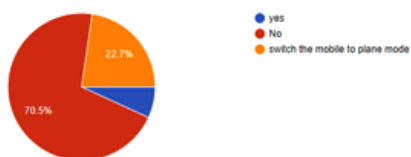


Fig. 3: The ways the mobile is being used

Do you switch off the mobile when you go to sleep?

88 responses



Where do you keep the mobile phone when you go to sleep?

88 responses

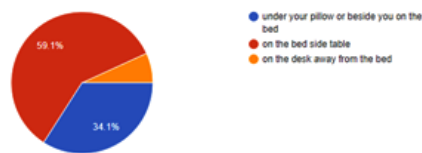
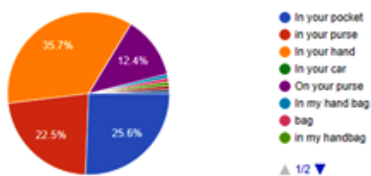


Fig. 4: Mobile phone during sleeping hours

Where do you keep your mobile when you are out door?

129 responses



Where do you keep the mobile when you are in the house/hostel?

129 responses

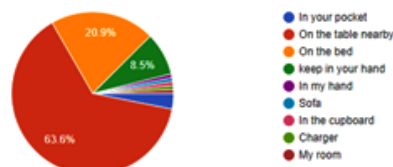


Fig. 5: Keeping the mobile phone while outdoors

2013). In Saudi Arabia, 53.4% of the students owned smart phones, 88% of the students in Kenya owned a mobile phone ^{24,25}.

100% of the students at Oman Medical College have their own smart mobile device and 50% of the students are using it more than 4 hours/ per day. Datta reported 33% of the students using more than 2 hours/day and he named them as “very frequent users of cell phone!” ¹. Rupani reported that 92.7% were highly involved with their mobile phones; 19% labeled as mobile phone addiction²⁶. Saxena also reported 57% students using smart phones more than 2 hours/day (63.6% females) ²⁷. In another study, mean time spent per day on mobile phone was 2.8 hours/day ⁸. Yadav reported 81% using smart phones and 65% were using more than 2 hours/day ²⁸. Hegazy et al reported 6 hours/day use of mobile phone in Saudi Arabia²⁹. In USA, it was reported that adults spend 4-6 hours/day with smart phones ³⁰. In another study medical students who were using phones for 75 minutes/day reported symptoms such as headache, whizzing sound in ear, sleep disturbances, loss of attention and arm and neck muscle spasm ³¹.

This use of smart mobile phones via WiFi is now a pandemic and many new symptoms have been reported related to this excessive use ³². It is therefore crucial to know the safety measures to protect yourself from the effects of electromagnetic waves. It is clearly known that using headphone is safer than putting the phone to your ear. Majority of students at OMC were using headphones.

Smart phone while sleeping

It has been reported that excessive mobile use is significantly related to sleep disturbances ³³. A study from Japan on 94,777 adolescents revealed sleep disturbances, short sleep, poor sleep quality, excessive day time sleepiness and insomnia for those who were using excessive mobile phone for calling or sending text messages until late at night ³⁴. Yogesh et al reported significant association of hours of usage and sleep indices in both males and females, negative association with sleep quality, sleep deprivation and day sleepiness affecting cognitive and learning abilities of medical students ³⁵. Poor sleep quality and quantity was also correlated by high internet and social network usage via smart phones ² and reduced melatonin production ³⁶. Sahin



Fig. 6: Parents influencing their children on the use of mobile phone

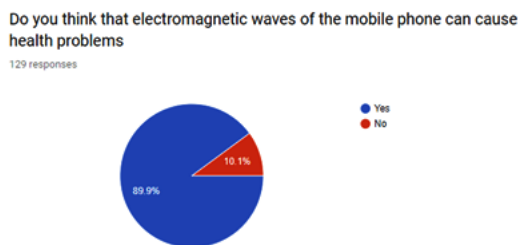


Fig. 7: Awareness on the hazards of electromagnetic waves emitted from the smart phones

et al reported sleep quality worsens with increasing the mobile addiction level ³⁷.

Keeping the mobile ‘on’ the whole night and placing it under the pillow would continue the exposure of electromagnetic waves to the head region which could be a cause of disturb sleep.

In this study 70% don’t turn the mobile off and 33% keep it under the pillow while sleeping, however, 60% keep it on the bed side table. It is

much safer to turn it in “airplane mode” during sleep or disconnect the WiFi and to place it at least 1-2 feet away from the body.

Use in the class room

It was interesting to note that students are now using their smart phones during the classes which may distract their attention from the lecture. Majority of the students keep the mobile phone ‘on’ during lectures, 65% receive or send messages, 20% of students play games and 7% make or receive calls which may distract them from concentrating on the lecture being delivered. It has become a routine practice to keep the mobile on during class room sessions. On the other hand many institutes are giving electronic devices to their students to be used during class rooms. Stanford University’s medical school has iPad instead of text books. No overall impact on academic performance was observed by using e-devices^{24, 38}. At the same time moving towards electronic textbooks, electronic data base and routine use of smart phone during their basic class room teaching and clinical ward rounds is encouraged and considered as part of their curriculum^{39,40}. Here at Oman Medical College, laptops are provided to the students, and WiFi is provided 24 hours to facilitate the students to make use of all the electronic media. However, students mostly misuse the internet and use it more for entertainment and watching movies than pedagogy. It should be advised to switch off the mobile while in a lecture.

Keeping the mobile phone

It is important how close to the body you keep the mobile. Putting in the front pocket of trousers by the males may affect their reproductive organs. Many are holding it in their hands which have the risk of bacterial contamination especially in the infectious clinical wards^{41,42}. High levels of electromagnetic radio-frequency waves are emitted from the mobile sets, so keeping the mobile phone close to the ear while talking may cause side effects due to absorption of the waves into the tissues.

Data et al reported 45% students have earache, headache and blurring of vision¹. In a cross-sectional study conducted at Baystate Medical Center in Western Massachusetts, the prevalence of ringxiety (Phantom Vibration Syndrome) was 68% in those who use electronic devices⁴³. During use of mobile data, REW level is high. We reported in a previous study that head phone with blue tooth (wireless) emit less radiations as compared to using mobile phone directly, however, head phone with wire is the safest option where the data is transferred by a cable. Head phone must be with a good quality wire to reduce radiation. Last but not the least, downloading data from the internet showed significant increase in the radio waves.

CONCLUSION

100% of the medical students at Oman Medical College are using smart phone during and after their college sessions. Majority of students are using WiFi for more than 4 hours per day. It is being used during lectures, and remains on during the night which exposes the students to electromagnetic waves. College provides WiFi for academic purpose; however, the students may overuse it for entertainment which may expose them to smart phone addiction and other related symptoms. Further studies should be done to access the mobile phone symptoms and to make policies for control the excess use of mobile phone specially for those who are academically performing below expectations.

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