

# A Review of Common Behaviour Problems and Procrastination of Academic Performances Secondary to Smartphone Dependence and its Addiction among Medical Students

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**Abstract:** *Mobile phones is said to be the new epidemic of this century. India is the largest market for mobile phone users in the world and medical students are no exception to it. On one side wherein the mobile phones are helpful in their study purpose, they also face the likelihood of a possible addiction liability to mobile phones. New operating systems like android and the applications relevant to medical study are helpful, but on the flipside, mobile phones pose a threat in terms of psychological dependence. In this article an attempt has been made to give emphasis on health related adverse effects of mobile phone addiction among medical students.*

**Keywords:** Smartphones, Medical students, Addiction, Psychological health and behaviour

## 1. Brief History of Smartphones

Mobile/hand phones are powerful communication devices, first demonstrated by Motorola in 1973, and made commercially available from 1984<sup>1</sup>. The term “Smartphone” first appeared in 1997, when Ericsson described its GS 88 “Penelope” concept as a smartphone<sup>2</sup>. Smartphone has become an integral part of our daily living<sup>3</sup>. Subscribers increased from 12.4 million in 1990 to 500 million in 2000 to 3.3 billion in 2008 and 5.3 billion at the end of 2010. According to a estimations the prevalence of mobile use will be increased to 95% and further more in the coming years. mobile phones use is now so extensive that in some countries the number of phone subscriptions outnumbers the population of country. Indian market is one of the largest in the world for mobile phones<sup>4</sup>.

Studies done before the introduction of smart phones in the market revealed that the young people use mobile phone for many purposes such as feeling secure, financial interests, effective use of time and being in touch with their families and friends. Whereas in a study done in 2014 revealed many other reasons for using mobile phones like using internet both for academics and social networking, listening to music, playing games, taking photos, online shopping and reading news. To-day, after the introduction of smart phones with internet connections, social networking, using face book and whatsapp have become the primary use of the mobile phones<sup>4</sup>.

The concept of Internet addiction was introduced by Young in 1996 as an “impulse disorder” not involving the ingestion of an intoxicant, making it a ‘behavioral addiction’ similar to gambling addiction and unlike alcoholism and several diagnostic criteria have been developed for Internet addiction<sup>5</sup>. The smartphone addiction problem is now growing across the world especially among the students<sup>3</sup>.

Mobile phone addiction can be said a type of technological addiction or nonsubstance addiction<sup>6</sup>.

## 2. Important Definitions

A smartphone according to Oxford dictionary (2017) is a mobile phone that performs many of the functions of a computer, typically having a touchscreen interface, internet access, and an operating system capable of running downloaded apps. While addiction is defined by the American Psychiatric Association, as the status of not being able to rationally judge or distinguish due to certain ideas or objects. Certain behaviors can induce short-term reward, which might turn into perpetual behaviour despite awareness of having reduced control over the behaviour, which is a fundamental concept of addiction. This equivalence brings up the idea of non-substance or “behavioural” addictions . Thus, smartphone addiction may be defined here as having diminished control over its usage despite knowing its deleterious consequences<sup>7</sup>.

The World Health Organization, WHO (2014) defines psychological or mental health as a state of well-being in which every individual realizes his or her potential, can cope with the normal stresses of life, works fruitfully and productively, and is able to make a contribution to the community<sup>7</sup>. Smartphone usage has also become an important public health problem as there have been reports of plenty of health hazards, both mental and physical, in people of all age groups. While some of these oft-seen effects are critical like cancers, others that cause definite morbidity are both physical and mental. The World Health Organization On 31 May 2011 confirmed that the cell phone use indeed represents a health menace, and classified mobile phone radiation as a carcinogenic hazard, possibly carcinogenic to humans<sup>8</sup>.

### 3. Introduction

Smartphones have become an integral part of everyone's life<sup>9</sup>. Individuals tend to forget their surroundings while using their smartphones. This neglect of the environment and people nearby may lead to new online acquaintances<sup>10</sup>. Smartphones can be a boon if used in correct way but if misused it can result in smartphone addiction. Terms like Smartphone addiction, mobile phone addiction, problematic mobile phone use, mobile phone dependence, compulsive mobile phone use, and mobile phone overuse are all expressions which have been used to explain more or less the same phenomenon, means Persons engrossed in their smart phone usage to such an extent that they ignore other areas of life<sup>9</sup>.

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<sup>11</sup>.

For many the smart phone has become an extension of their ear, from the moment they wake up until the second they fall asleep. This love affair with the mobile phone is both enabling and crippling at the same time. Individuals' behaviour and daily habits are being changed due to increasing utilization of new technological devices and virtual communication involving personal computers, tablets and mobile phones (smart phones). In addition to providing various advantages these new technologies, can lead to many type of social problems for example social isolation, economic problems like larger debts incurred to buy or use smart phones. It can also cause both psychological and physical pathologies like damages due to electromagnetic field radiation, car accidents, distress linked to the fear of not being able to use new technological devices<sup>4</sup>.

#### Reason Behind Over Use of Smartphones by Students

University students likely to adapt early on electronic devices and, they can be categorized as early adopters. For them, smartphone is something interesting, entertainment objects, can connect with friends and giving them a sense of autonomy, identity and credibility. It has been seen that 4.61 billion adolescent are currently using mobile phone<sup>12</sup>.

#### Discussion of Common Behaviour Problems due to Smartphone Addiction

According to WHO Expert Committee – 1964, addiction to any particulate substance or any act is considered as dependence. The continuous use of something which is apparently believed to provide oneself a sort of comfort, relief or stimulation, resulting in cravings when the same is absent. The overall increase in usage of smart phones in young and adolescent age group in their everyday life has made smart phone addiction a significant social morbidity in society. Its late effects due to increased use include physical health-related problems, such as musculoskeletal disorders of the hand, wrist, cervical spine, back muscles, ocular manifestations and elevated risk of psychological disorders such as attention deficit, aggression and even sleep disturbance<sup>13</sup>. The excessive smartphone use can cause

physical difficulties, such as neck stiffness, wrist or back pain, blurred vision, and sleep disturbances. It can also reduce academic achievement, social interactions, and lead to relationship problems<sup>14</sup>.

According to a study Cell phone addiction scores in students who lived in dormitory were significantly higher than other students. This could be due to be away from family and homesickness and loneliness. Prior study among university students revealed that there is a significant relationship between loneliness and cell phone addiction. Internet and cell phone addiction were related to male gender, age less than 25, higher educated father, and high socioeconomic status of family<sup>5</sup>.

Cell phone and internet addiction scores in students who had wealthy family were significantly higher than the other students that were consistent with previous findings wealthy families may not only have the economic resources for cell and Internet expenditures, but also create a particular cultural environment for their use. Also cell phone and Internet addiction scores in students who had higher educated fathers were significantly higher than the other students. These fathers are more likely to socialize their children into the world of modern information technology<sup>5</sup>.

According to Cholz, the problem of using smartphones is related to behavioural addiction due to clinical features such as psychological effects on emotions, personality and cognitive in which the younger generation is more prone to excess use and dependency of smartphones. Alavi et al. found that individuals suffering from behavioural addiction having symptoms such as craving, excessive behaviour, psychological and physical withdrawal symptoms. This behavioural addiction generally feature a very strong desire that encourages someone to do something repeatedly without the ability to control, to reduce or to stop<sup>15</sup>.

According to Chiu, smartphone addiction can cause mental health problems for example depression and anxiety that will cause critical barriers in relationships, activities, physical and mental well-being. This issue has reached a significant public health concern and in the year 2015, WHO issued a report on Public Health Implications of Excessive Use of the Internet, Computers, Smartphones and Similar Electronic Devices. This report summarizes the problems associated with excessive use of smartphone with mental health such as anxiety, depression and stress<sup>15</sup>.

Mobile phone in conjugation with many biological factors is causing the sleep loss and disturbing the circadian rhythms of the body. Sleep is an internal body mechanism which is needed for mental and physical health. The Center for disease control (CDC) recommends that an average adult should sleep 8.5-9.25 hours per night. Healthy people, 2020 has signified the adequate sleep for the health of Americans and has set the goal to increase the percentage of individuals with adequate sleep. The population surveys in European countries have found that most people complaint of sleep disturbance and tiredness by RF-EMF exposure produced by mobile phones and then this Poor quality of sleep reflects in learning difficulties, inadequate performance and deregulated metabolism, endocrine and immune responses.

AS the number of the gadget users are increasing so is the exposure to the radiofrequency electromagnetic field (RF-EMF). This RF-EMF produced by the mobile phones is affecting the sleep electroencephalogram and melatonin production<sup>16</sup>.

Studies on cancer due to electromagnetic radiations due to cell phones are available but there is a need to research on the harmful physical and mental effects specially on rampant users, like college-goers<sup>8</sup>.

Mobile phones uses non-ionizing low radio frequency electromagnetic waves (REW). It causes DNA damage, affecting genes, membrane function and signal transduction. Functions of the central nervous system, permeability of the blood brain barrier and melatonin synthesis, are also affected. REW exposure increases free-radical production which causes metabolic, immunological and carcinogenic effects. 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, which are now linked to the base stations in the vicinity of residential areas and excessive use of mobile phones. In children Childhood leukemia which is 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*", 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<sup>11</sup>.

#### Nomophobia and Rinxiety

Smart phones today have become an important part of our techno-culture, especially among the younger population. Anxiety, discomfort, nervousness caused by being out of contact with a mobile phone is termed as "Nomophobia"- no mobile phobia. Nomophobia is on the rise across the globe<sup>4</sup>.

'Mobile phone addiction' has been referred by many researchers as 'nomophobia and ringxiety'. This compulsive behaviour is comparable to compulsive gambling and video gaming which have physical and psychological withdrawal symptoms like anxiety, restlessness and irritability. Other symptoms such as headaches, earache, warm sensations, concentration difficulties and fatigue have also been reported. Another 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 screen of phone frequently to avoid missing any kind of messages, phone calls, notifications, which is referred to as ringxiety. Some terminologies described by Ritu are "textaphrenia", "textiety" "post-traumatic text disorder" and binge texting as newly developing disorders related to smart phone use<sup>11</sup>.

Dixit et al in Indore observed twenty one out of 109 (19.26%) hostellers and 16 out of 91 (17.58%) day scholars were found to be Nomophobic. statistically significant association was not observed in relation to place of stay and academic sessions with Nomophobia score which was very similar to the observations made in our study<sup>4</sup>.

The study conducted in Chennai (2014) highlighted that 52% of the medical students felt that they can't live without their mobile phones. A study in Bangalore by Pavithra MB, et al. (2015) stated that 39.5% of the medical students suffered from nomophobia (fear of being out of contact with mobile). They also reported that 27% of the medical students were at risk of developing nomophobia. Gupta N, et al. (2015) reported that 24.6% of the medical students had difficulty in concentrating in their studies due to late night mobile phone use. The study conducted in Indore also reported that males had higher dependence on mobile phones than females. The study conducted in Bangalore also stated that males had higher prevalence of nomophobia than females<sup>17</sup>.

#### Mobilephone Use in the Class Room by Students

It was interesting to note that students are now using their smart phones during the classes which may distract their attention from the lecture. According to a study majority of the students keep the mobile phone 'on' during lectures, 65% of students receive or send messages, 20% of students play games and 7% make or receive calls which often distract them from concentrating on the lecture being delivered. It has become a routine practice to keep the mobile on during class room sessions<sup>11</sup>.

It is very important how close to your body you keep the mobile. When Putting in the front pocket of trousers by the males may affect their reproductive organs. Many holds it in their hands which have the risk of bacterial contamination especially in the infectious clinical wards. 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<sup>11</sup>. The study also found that playing games on smartphones predicted addiction for male students, whereas uses of multimedia and social networking applications were predictors for females<sup>18</sup>.

#### 4. Conclusion and Suggestions

Mobile phones and have both positive and negative aspects. Mobilephones have not only helped improve worldwide communication, newer technology through new social media, social network sites, social informatics, and "social software" enables us to perform many jobs quickly and efficiently. On the other side, the long-term usage leads to its addictive behaviour. Further research and multi-centric studies are required to assess the real problem and to investigate more in depth the psychological aspects and solutions for Nomophobia<sup>4</sup>.

Now there is a need to create possible health education programs and interventions that are appropriate to deal with the addiction to the university students and improve mental well-being<sup>15 12</sup>. Since general health affects many aspects of students' life, including their academic achievement, identifying health-related factors can be fruitful in planning for enhancing factors of general health in medical students<sup>19</sup>. Educational institutions, schools and universities should try to develop new teaching concepts to educate the students for use of internet and cell phone meaningfully and correctly<sup>5</sup>.



A significant burden of mobile phone addiction and a tendency for impaired control that compromises the health and wellness were prevalent in medical students. Measures need to be taken to address this challenge in view of the current era of growing information technology. Future studies need to design and test interventions for addressing this evolving public health problem<sup>6</sup>. It is the requirement of the hour for planning of intervention programs at college settings involving the parents, psychiatrists, counselors, and other mental health professionals emphasizing the addictive potential of smart phones and finding remedies like involving them in sports, dance drama, book reading in library etc. during their free hours to wean them off from these technological addiction<sup>13,20</sup>.

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