

Prevalence of Cell Phone Addiction and Its Relation with Anxiety: A Cross-Sectional Study among Young Indian Medical Students

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Abstract: Cell phones have made our lives easier and have become indispensable for everyday life; however, their uncontrolled and excessive use can trigger “cell phone addiction”. Cell phone addiction is a rising public health issue, particularly among young people around the world. Cell phone overuse really becomes a problem is when they have underlying anxiety or depression. This can exacerbate it or make their symptoms to manifest. There is a dearth of empirical research about cell phone addiction and its impacts on young adults. This cross-sectional study is an attempt to fill this gap. Data was collected from 145 medical students in the age group of 18 to 24. My study revealed that 32 out of the 145 students suffered from moderate to severe cell phone addiction. Females were found to be more addicted to cell phones than males. Cell phone addiction among final year students were far less compared to the other years. Almost half the students accepted that they used their cell phones to tide over their down time. A positive correlation was found between cell phone addiction and anxiety. But the hypothesis needs further evaluation. A bigger sample would give better opportunity to comment on the existence of a relationship between cell phone addiction and an anxiety.

Keywords: Cell phone addiction, anxiety, medical students, addiction, cell phone

1. Introduction

With the dramatic increase in mobile phone usage in recent years, reports of mobile phone addictions have come out in public. People worldwide have become increasingly enthusiastic in embracing mobile digital communications equipment. More than one out of six people worldwide now have mobile phones and have become an intrinsic part of their lives [1]. Along with the dramatic increase in mobile phone use in recent years, the report of cell phone addiction has also increased. Most of the users are more dependent on the mobile than they themselves are aware [2]. Some psychiatrists believe that mobile addiction is not different from any other form of addiction and it has become one of the most prevalent non-drug addictions [3]. Cell-phones make it easier to stay in touch with other people. This is an important factor for anxious people as there are psychological benefits arising from mobile phone use. An obsessive-compulsive subject can use the phone to check things they are obsessed about, whereas those with a social phobia can avoid face-to-face meetings by using the phone [4]. Mobile addicts tend to neglect important activities (job or studies) and drift away from friends and family. They refuse to accept their problem and think about their mobile constantly when they do not have it with them [5]. My study sample consists of medical college students between 18 and 24 years of age mainly because they are more vulnerable to developing dependencies with regards to using technologies like mobile phones and internet. The possible reasons for this are that college students have yet to develop a firm sense of identity and have a strong sense to develop meaningful and intimate friendships [6]. Such addictive behavior permits them to deal with anxiety, frustration, and failure and also to gain admission to peer groups and demonstrate identification with a youth culture [7]. Mobile use has many adverse effects on the body. It has a thermal effect on brain. Sleep pattern is disturbed [8] and it is also suspected to cause increase incidence of cancer or at least

increases the multiplication of cancer cells [9]. Young population is more prone to this. So, efforts must be taken to curb mobile use [10]. In this study emphasis is given on the psychological aspect of it. Mobile phone addiction can take a psychological toll, leading to isolation from the user's social environment [11]. Through this study I intend to investigate if there is any relation between being a cell phone addict and having anxiety symptoms.

2. Review of Literature

Traditionally, the concept “addiction” was based on a medical model and was reserved for physical and psychological dependence on a substance – and not a behavioral pattern. But recent research suggests that addiction should be widened to cover a broader range of behaviors [12-15].

In a study by Chen.Y.Fon Taiwanese college students, Taiwanese mobile addicts reported that frequent usage of their mobile phones affected their academic learning and performance. In the Taiwanese study only a non-statistically significant negative relationship was found between cell phone addiction and depression. There was no gender difference in mobile phone addiction. This might be because of the social and cultural background and equality amongst the sexes in Taiwanese society. The questionnaire was administered online. The questionnaire was a Chinese translation of an English questionnaire. Improper translation is a problem when questionnaires are translated. As the questionnaire was administered online, proper guidance regarding the questionnaire was not available. Anxiety can have many causes starting from personal tragedy to natural calamity. A person suffering from any chronic disease can also have anxiety. All such confounding factors which can cause anxiety were not removed. All these might have been the reason why the results obtained were inconsistent with that obtained elsewhere [16].

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In my study all those who were known to suffer from anxiety were excluded. My proforma includes questions to remove most of the confounding factors which might interfere with my objective of the study. Anyone who had these confounding factors was excluded. My questionnaire was distributed in person. Necessary information and guidance were given as required so that the students taking part in the study filled the questionnaire correctly and honestly.

A study in Korean adolescents was done by Jee Hyun and Seung- Ho. The study included 595 participants (male- 552; female-43) the students belonged to the technical school hence the male dominance. This male dominance will play a role in the final result as it's been found that females are generally more addicted to cell phones than males. Not only that, females are more likely to have a resultant psychological distress. An excessive cellular phone use survey (ECPUS) consisted of 20 questions developed by the author's clinical experience and hypothesis was applied. This was not validated as a diagnostic tool. This puts a question mark on the relevance of the result. Results from 595 participants showed that those with cell phone addiction expressed more depressive symptoms, higher interpersonal anxiety, and lower self-esteem [12].

In my study a medical college is chosen where males and females are expected to be present in roughly the same numbers. Due to the non-availability of a standard questionnaire for cell phone addiction I did a pilot study of my questionnaire and validated it before using it as a tool.

A study by Lisa j. Merlo, Phd, and Amanda m. Stone, from The University of Florida, in Gainesville reported that those with greater self- reported anxiety also had greater cell-phone dependence and abuse scores. The study involved 183 individuals from a very large range of age, from 18 to 75. This means that the number of years of mobile phone use varies considerably in the sample. It has also been found that youngsters are more prone to develop cell phone addiction and its resultant anxiety. In this study only 36% were students. The study subjects had owned a cell- phone for an average of 7.2 ± 3.8 years. It has been found that, those who have been using mobile phones for many years do not tend to be addicted to it [17].

In my study I have taken 145 students in the age group of 18 to 24. This is the most susceptible age group. So, the chances of cell phone addiction being present are more in my sample. The addiction resulting in anxiety is also seen more in these age groups. So, individuals who suffer from anxiety may benefit from a clinical assessment to rule out cell-phone abuse or dependence [4].

In the Rutgers Cross National Project three randomly sampled American surveys conducted in the spring of 2004. Paper and pencil surveys were distributed to 518 American undergraduates of whom 53.4% were females. The results showed patterns of mobile phone addiction with a significant statistical difference between genders. Female respondents indicated mobile phone addiction more than the male respondents. The results also showed a trend that the

longer the respondents owned their mobile phones, the less addicted they reported them to be [18].

The conclusions of a study elaborated by the office of defense of the minor of the community of Madrid in the year 2004, by the organization 'Protégeles' (protect them), based on a poll taken of children and adolescents between 11 and 17, are that 38% of those young people from Madrid felt 'upset', or 'felt awful' if they couldn't use their cell phone, normally as a result of punishment or fault with the phone [19]. But in this study very young preteens were also included which might have led to some inconclusive results. This is because very young candidates are positively awed by cell phones rather than addicted. Many might even give false information not understanding the importance of the study. In my study young adults are taken as a sample. They are educated and understand the importance of the studies and hence were willing to co- operate. They also were intellectually capable to understand the questions asked in the questionnaire and answer to them correctly. Mobile use has many adverse effects on the body [20]. Cell phones emit microwaves known as radio-frequencies that interfere in important bodily systems [21] British military scientists believes that cell phone transmissions disrupt the brain sites for memory and learning, causing forgetfulness and sudden confusion [22]. It has a thermal effect on brain and sleep pattern is disturbed [23]. Increased cell phone can not only result in disrupted sleep but also stress, fatigue and restlessness [24].

Aims and objectives

- 1) To find out the frequency of cell phone addiction in the students of Rajiv Gandhi Medical College (RGMC), Kalwa, Thane, Maharashtra, India.
- 2) To find out the frequency of anxiety symptoms in the same students.
- 3) To examine the presence of a relation between cell phone addiction and anxiety in the same students.
- 4) To find out if the relation is statistically significant.
- 5) To find out if there is any difference in the relation between cell phone addiction and anxiety in different gender.

3. Materials & methodology

Materials:

The materials used for this study will be two questionnaires i.e.

- Zung self-rated anxiety scale date:
- Cell phone addiction questionnaire

Methods:

Study design: Prospective, Single Observer, Single Centre, Cross Sectional Study

Centre of the study: RGMC, Kalwa, Thane, Maharashtra, India.

Duration of study: 2 months from June 10, 2009 to August 9, 2009.

Sample size: 145

Study criteria:

Inclusion criteria:

- 1) Medical students of RGMC
- 2) Sex: both males and females
- 3) Age group: 18 to 24 years of age
- 4) Consent: volunteer should be willing to give informed consent to participate in the study

Exclusion criteria:

- 1) Students who are diagnosed of having an anxiety illness
- 2) Students who have any other major medical illness at the time of the study

4. Procedure

It was a complete enumeration study. The study was conducted in the medical students of RGMC, Kalwa, Maharashtra, India. The total intake capacity of the institute is 60 students per year. As there are four years of medical students studying at a time, total no: of students were 240. Contents and implication were explained individually to the undergraduate students. If they satisfied the inclusion criteria and agreed to participate, written consent was taken from them. A pilot study was carried out and the questionnaire for cell phone addiction was validated. The participants of the study filled out the cell addiction questionnaire to find out if they show any signs of having cell phone addiction. There were 16 yes or no questions. After which they were asked to fill out the Zung's anxiety questionnaire to find out if they show any symptoms of anxiety. The results of the cell phone addiction questionnaire were then evaluated. Each 'yes' was considered as '1' and each 'no' was considered as '0'. The total score was given out of 16. Addiction score was then graded as follows- <4: not addicted, 4-8: mildly addicted, 8 - 12: moderately addicted, 12- 16: severely addicted

The results of the Zung's scale were then evaluated. The total score was between a minimum score of 20 to a maximum score of 80. The results thus obtained were then compared to see if there was any relation between cell phone addiction and anxiety .

Tests for analyzing data:

- Chi square test
- Pearson product moment test

5. Observation & Results

Table 2: Frequency of Cell phone addiction according to sex

	Females	Males	Grand Total
1 st MBBS	18 (53%)	16 (47%)	34
2 nd MBBS	17 (47%)	19 (53%)	36
3 rd MBBS	10 (32%)	21(68%)	31
Final MBBS	19 (43%)	25 (57%)	44
Grand Total	64 (44%)	81 (56%)	145

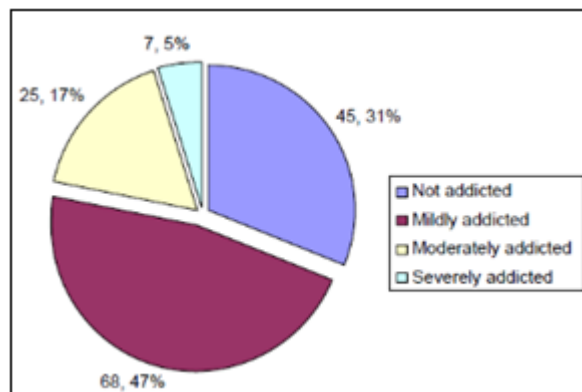


Figure 1: Cell phone addiction in the study sample

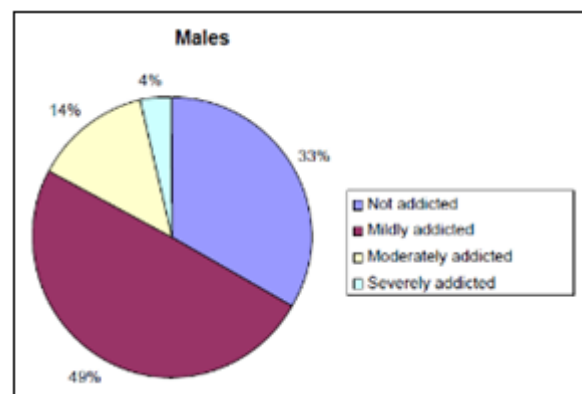


Figure 2: Cell phone addiction in Males

Table 2: Frequency of Cell phone addiction according to sex

	Male	Female	Total
With no or mild addiction	67 (82%)	46 (72%)	113 (78%)
With moderate or severe addiction	14 (18%)	18 (28%)	32 (22%)
Grand Total	81	66	145

Table 3: Cell phone addiction in different academic years

	Ist	IInd	IIIrd	Final	Total
With no or mild addiction	29 (85%)	25 (69%)	23 (74%)	36 (82%)	113 (78%)
With moderate or severe addiction	5 (15%)	11 (31%)	8 (26%)	8 (8%)	32 (22%)
Total	34	36	31	44	145

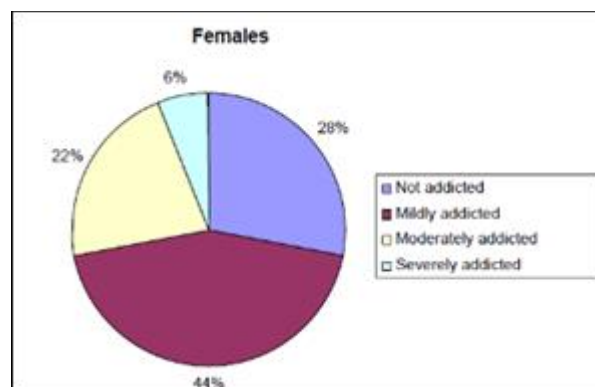


Figure 3: Cell phone addiction in Females

Table 4: Cell phone addiction in different age group

	18- 20	20- 22	>22	Total
With no or mild addiction	33 (75%)	52 (78%)	28 (80%)	113 (78%)
With moderate or severe addiction	11 (25 %)	14 (22%)	7 (20%)	32 (22%)
Total	44	66	35	145

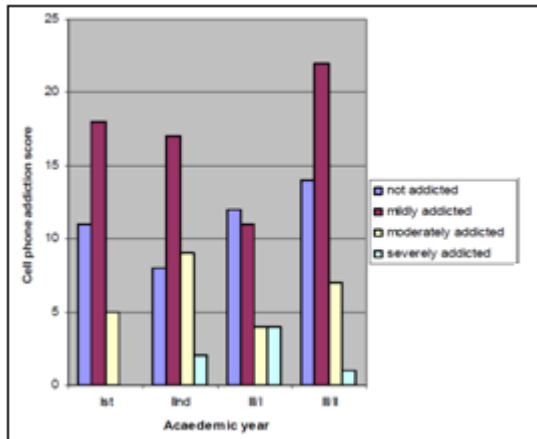


Figure 4: Cell phone addiction in different academic years

Table 5: Frequency of cell phone addiction in those staying at hostel and home

	Home	Hostel	Total
With no or mild addiction	42 (76 %)	51 (81 %)	113 (78%)
With moderate or severe addiction	20 (24 %)	12 (19 %)	32(22%)
Total	82	63	145

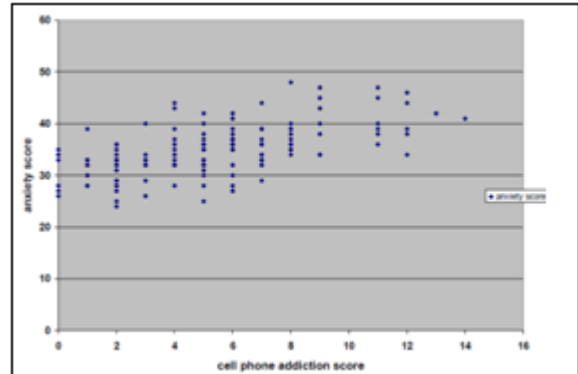


Figure 5: Relation between cell phone addiction and anxiety

Table 6: Percentage of students who answered “yes” to some relevant questions in cell phone addiction questionnaire:

1) Do you have your cell phone with you constantly; even at home you have it in your pocket or right next to you?	53%
2) Do you fiddle with your cell phone whenever you have downtime?	48%
3) Do you find someone to call as soon as you leave the office or land in a plane?	23%
4) Do you always feel anxious about your cell phone, especially when you are unable to use it?	24%
5) Are you uncomfortable and fidgety when you are not using your cell phone?	20%
6) Do you feel the need to talk on the phone almost all the time?	10%
7) Do you take cell phone breaks while at work?	55%
8) Do you take cell phone breaks while at work?	26%
9) Do you experience high levels of anxiety, stress, or insecurity whenever you are without your cell phone?	20%
10) Do you sleep with your cell phone under your pillow or on a night stand right next to the bed?	67%
11) Have you ever been teased because you had your cell phone while working out or some other activity?	19%
12) Has your personal cell phone use increased significantly?	50%
13) Do you feel stress when the cell phone bill arrives, then shock once you actually see the amount?	16%
14) Have you had problems at work or school or family or friends because of your cell phone use?	17%

6. Discussion

In my study sample 44% (64) were females and 56% (81) were males (table no:1). In my study it was found that 32 students out of the 145 students i.e. 22% had moderate to severe cell phone addiction (figure 1). Females in the sample were found to be more addicted to cell phones than males (table no:2). But as found in a study by Chen.Y.F On Taiwanese college students the difference was not statistically significant [16] however in the Rutgers cross national project there was significant statistical difference between genders. Female respondents indicated mobile phone addiction more than the male respondents (figure 2 &3) [18]. cell phone addiction amongst students belonging to final year MBBS was found to be far less compared to the other years (table no:3, figure 4). The probable reason being increased study load and less time to indulge in cell phone use. The difference was however not found to be statistically significant. Three characteristics of mobile phone addiction are that people who are addicted to mobile phone always keep their phone on. The second is that they tend to use their mobile phones even when they have a land line phone at home. And finally, they normally are confronted with

financial and social difficulties due to their excessive mobile phone use [25] according to the result of my study, 53% of the students keep cell phone with them constantly; even at home they have it in their pocket or right next to them. While 50 % admits that their personal cell phone use has increased lately. This means that characteristics of cell phone addiction were present in at least half the students in the study sample. All these give an idea regarding the prevalence of cell phone addiction in the study sample. Another study says that those who consistently used a mobile phone were more likely to report negative “spillover” between work and home life and, in turn, less satisfaction with their family life. Spillover essentially means that work life may invade home life and vice a versa [26].17 % of the students in my study admit that they have had problems at college or family because of their cell phone use. 55% of the students feel a need to take cell phone breaks while studying (table no :6). This is to mean that more than half of the sample feels that cell phones interfere with their academics. A whopping 67% sleep with your cell phone under their pillow or on a night stands right next to the bed. Mobile use has many adverse effects on the body. And by keeping the cell phone near while sleeping means

more exposure to cell phone radiation. According to a new study radiation from mobile phones delays and reduces sleep, and causes headaches and confusion. Professor Bengt Arnetz believes that the radiation may activate the brain's stress system, making people more alert and more focused, and decreasing their ability to fall asleep [27]. According to Merlo, PhD University of Florida, In Gainesville, frequent users often become anxious when they are forced to turn off the phone or if they forget it at home, so much so that they can't enjoy whatever they're doing [4]. One in five in my study felt anxious when they are unable to use their mobile phones when they are in a class. And one in four felt experience high levels of anxiety, stress, or insecurity whenever they are without their cell phone when they forget their cell phones at home. This shows that there is some correlation between anxiety and cell phone addiction (figure 5). Cell phone addiction may lead to anxiety and vice versa. A study elaborated by the office of Defense of The Minor of The Community of Madrid revealed that 38% of those young people from Madrid were felt 'upset', 'overwhelmed' or that they 'felt awful' if they couldn't use their cell phone [27]. Close to 50 % of the students in my study sample accepted that they use their cell phones to tide over their down time. They use the mobile phone as a way to escape from problems. [28]. There was no significant difference in cell phone addiction amongst students staying in hostel and those staying at their home (table no :5). Amongst different age group also prevalence cell phone addiction was more or less the same (table no: 4). On finding out the correlation cofactor between cell phone addiction scores and the anxiety scores a positive co relation was found which was statistically significant. An interesting observation made in the study was that females showed more correlation between cell phone addiction scores and the anxiety scores. This means that females are more likely to have an anxiety due to cell phone addiction. Both these observations were in accordance with a study done on Koreans by park [29] and by Chen in an American sample [16] so there is some statistically significant positive correlation between anxiety and cell phone addiction. Cell phone addiction may lead to anxiety and vice versa. However, this hypothesis needs further exploration.

7. Limitations of the Study

In this study medical students were chosen. Medical students in comparison with students in other professions have many reasons to have anxiety mainly pertaining to studies. This might have been a limiting factor while comparing cell phone addiction with anxiety score.

8. Future Implication

This study is a baseline results for future studies. Cell phone addiction in students should be compared with other factors like

- Academic performance
- Mental depression
- Social score
- Number of friends and problems in friendships

9. Conclusion

This study yielded some interesting findings about self-reported mobile phone addiction. There was significant positive relationship between mobile phone addiction and anxiety levels in the study sample. It was also found that females were more addicted to cell phones than males. However, this hypothesis needs further exploration. A bigger study sample would give a better opportunity to comment on the existence of a relationship between cell phone addiction and anxiety. Number of female students was slightly less in the sample compared to males. In future a better-balanced study sample should be selected so that comparison of cell phone addiction between the sexes can be made more relevant. Not much literature was found about cell phone addiction in India. So, this study is certainly a step forward in bringing into light the prevalence of cell phone addiction in the Indian youth. It's a general idea that Indians are not much exposed to gadgets like mobile phones as compared to the youth in other developed countries. But this study shows that not only is cell phone addiction prevalent, but also shows statistically significant relationship with anxiety. In the light of growing literature about the harmful effects of cell phone radiation, it should be given due recognition and measures should be taken to avoid its harmful effects. Information should be given to the youth about the possible risk linked to the abuse of technology and to promote a responsible approach to mobile phone. This research result is preliminary and further research is required to get a clear picture regarding cell phone addiction amongst Indian youth. Future studies might want to consider cultural differences and seek better scales. Random samples or larger samples may help to get more representative results. More research is needed to establish other issues associated with mobile phone addiction like academic performance,

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