

# Ringxiety and the Mobile Phone Usage Pattern among the Students of a Medical College in South India

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## ABSTRACT

**Aims:** Technologies like mobile phones may not always work positively but they may have unforeseen adverse effects. This study was conducted to find the proportion of students who experienced ringxiety (phantom ringing) and other perceived effects, as well as the pattern of the mobile phone usage among college students.

**Method:** A cross-sectional study was carried out at Kasturba Medical College, Mangalore, south India, among 336 medical students by using a pre-tested, semi-structured questionnaire.

**Results:** Among the total number of students, 335 students possessed mobile phones. Mostly, the persons whom they talked to on their phones were parents for 220 (51%) of the

students. 48% (150) talked for less than half hour in a day and 41% (137) were high volume message users. "Ringxiety" was experienced by 34.5% (116) of the students and they were more likely to use their phones at restricted places like classrooms (99%) and libraries (60.3%). A significantly larger proportion of ringxiety sufferers also complained of hampered studies.

**Conclusion:** The pattern of mobile phone use among the medical students appeared to be problematic, as a fairly large proportion suffered from ringxiety, they reported getting very upset and they used their phones at restricted times and places. This problem needs to be recognized, all stakeholders must be made aware of the symptoms and measures must be taken to reduce it.

**Key Words:** Mobile phone, Psychological effect, Ringxiety

## INTRODUCTION

Mobile phones are considered to be an important part of one's lifestyle today. Parents provide small children with cell phones, maybe under the mistaken assumption of keeping a check on them, but it may prove to be more harmful than good. There are evidences that point to the fact that cell phone usage has the potential to not only cause physical effects which range from headache to dysaesthesiae of the scalp, but also addiction like any other substance [1-4]. However, the effects of the cell phone usage studies have not kept pace with the growth of the technology itself, which has been phenomenal. A bibliometric analysis which was done in 2009, on the studies which were published all over the world on the addiction to the internet, video games and mobile phones, showed that the latter constituted only 2.1% of the studies [5].

Mobile phone growth in India has been fast and it has reached all segments of society, especially the young [6]. There have been situations where the mobile phone usage among the young has been seen as problematic by the surrounding people [7]. In recent years, a psychological problem which results from the excessive use of mobile phones which is called "Ringxiety", has been reported. It is a condition where individuals hear the phone ringing when it actually hasn't, which is also called "phantom ringing" [8]. It has been estimated that 25% of the mobile phone users in India could be suffering from this disorder [9]. Excessive mobile phone use has been found to be associated with headache, stress, sleep disturbances and depression [10 -12]. It was also found to be a risk factor for the development of the mental health outcomes in a study with one year follow up, which was done among young

adults in Sweden [12]. Since the mobile phone use is ubiquitous and as youth form a large group of the users, its negative effect, immediate or long term, could also be widespread. The literature search has revealed no such studies in India, though the potential impact of the mobile phone use on various body systems has been elaborated [13]. Hence, this study was planned to find out the pattern of the use and the perceived effects of the mobile phone usage among students in a medical college of Mangalore city, south India.

## MATERIALS AND METHODS

A cross sectional study was conducted among medical students in Kasturba Medical College (KMC), Mangalore, south India. This is the oldest private medical college of the country, with students coming from all over the world, like from Sri Lanka, Malaysia, Canada, Africa and the Middle East. The college enrolls a batch of 250 students each year for MBBS. For lecture purposes, each batch is divided into two sub-batches of 125 students. The minimum sample size was calculated to be 266, taking into consideration that 40% of the student population of a previous study had self reported an addiction to mobile phones [14] with an allowable error of 15% and a 95% confidence level. The data was collected by using a pre tested, semi structured questionnaire. From a total of 6 sub-batches which were there at that time, 3 were randomly selected. The students in the selected batches were approached in their lecture halls and they were invited to participate in the study. After taking informed consents from them, the questionnaire was distributed. The ones who refused to participate were instructed to return the questionnaires unfilled. A total of 336 students returned

the filled questionnaires. The data was entered in MS Excel and analyzed in SPSS, version 11.5. The Chi square test was used to find the significance and a p value of <.05 was taken as statistically significant.

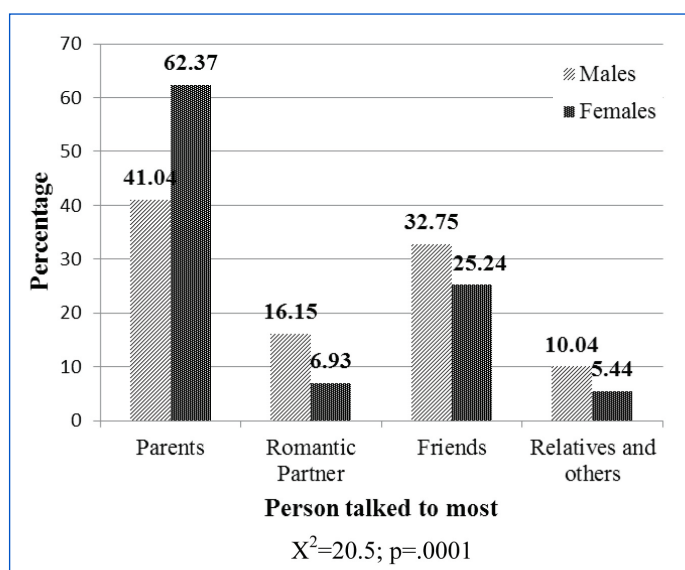
## RESULTS

Of the total 336 students, 173 (50.9%) were males and 163 (49.1%) were females. Their mean age was 20.6 years (SD=1.36) and only one of the 336 students did not own a mobile phone. Therefore, the further analysis is for the 335 students who owned and used mobile phones.

Among the ones who possessed mobile phones, 264 (78.8%) had one phone and 71 (21.2%) had two or more phones.

Regarding the persons with whom they talked to mostly on their mobiles, parents were quoted by 220 (51%) students, followed by friends by 126 (30%) students. There was a significant gender difference with respect to the persons to whom they talked to most, with more of the females talking to their parents and more of the males talking to their romantic partners [Table/Fig-1].

The pattern of the mobile phone use by students showed that the median duration of the talk time in 24 hours was 45 minutes (IQR 20, 120) and that the median number of messages which were sent per day was 20 (IQR 10, 50). Half of the students reported that they spent less than half an hour a day on other features of the phones and 48.4% (150) of the students reported talking for half an hour or less per day. Most of them reported that they used their phones mostly at night [47.8% (180)] or in the evening [42.8% (161)]. Over a third (39.7%) of them reported that they used them in the ringing mode mostly and 60% (201) said that they used them mostly in the vibrating mode or the silent mode. The use of mobile phones by the students at places and situations in which it was prohibited was quite common, which ranged from 17.9% (60) who used it while driving to 95.5% (320) who used it in their classrooms. 98% of the students who used the phones in class, kept it in silent mode and 216 (67.5%) said that they replied to messages during the class. Seventeen students (5%) had accidents due to the use of mobile phones during driving and of these, 15 had minor and 2 had major accidents [Table/Fig-2]. The students reported spending a median of Rs.300/- [IQR 200, 500] per month on mobile phones.



[Table/Fig-1]: Persons with whom students talked most often on mobile phone

The proportion of the students who had the symptom of “ringxiety” was 34.6% (116). Of these, 51.8% (60) were males and 48.2% (56) were females.

The students also checked their phones several times a day, with 85.3% (249) checking up to 10 times. In case of a network inaccessibility or a phone malfunction, 128 (39%) of the students said they would be very upset or extremely upset. Among males, 30.5% (50) fell into the upset group as compared to 47.5% (77) among females and this was statistically significant (p=.002). Upon the loss of the phone, 87.3% of the students said that they would either buy immediately or take from a friend and buy later [Table/Fig-3].

	No.	%
<b>Call duration/day in minutes</b>		
≤30	150	48.4
31-60	66	21.3
61-120	51	16.5
≥121-300	43	13.9
Total	310	100.0
<b>Number of messages sent per day</b>		
0	17	5.1
1 - 5	68	20.3
6 - 10	55	16.4
11 - 20	58	17.3
>20	137	40.9
Total	335	100.0
<b>Time of maximum use</b>		
Morning	23	6.1
Afternoon	12	3.2
Evening	161	42.8
Night	180	47.9
Total	376	100.0
<b>Mode of use</b>		
Ringing	133	39.7
Vibrating	122	36.4
Silent	79	23.6
Switch off	1	0.3
Total	335	100.0
<b>Time spent on other features</b>		
<1 hr	167	49.9
1-2 hrs	66	19.7
>2 hrs	24	7.5
don't use at all	77	23.0
Total	335	100.0
<b>Use at Place/situation</b>		
Classroom	320	95.5
Library	202	60.3
Eating	219	65.4
Driving	60	17.9

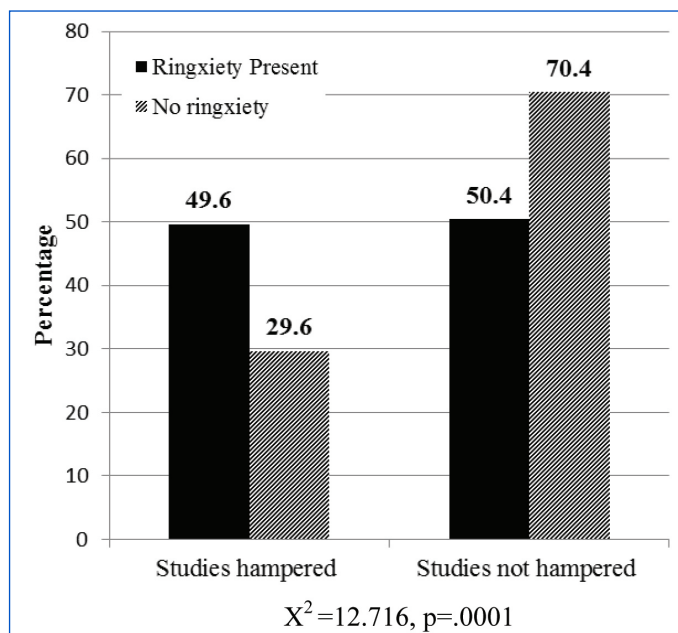
[Table/Fig-2]: Pattern of mobile phone use by the students

No of times checked phones in a day	No.	%
0-10	249	85.3
10 to 20	28	9.6
>20	15	5.1
Total	292	100.0
How upset would they be if phone stopped working		
Extremely upset	36	11.0
Very upset	92	28.0
Just a little upset	146	44.5
Not upset	54	16.5
Total	328	100.0
Urgency of response to loss of phone		
Take from friend and buy another later	149	46.3
Buy one immediately	133	41.3
No problem staying without a mobile	30	9.3
Others	10	3.1
Total	322	100.0

**[Table/Fig-3]:** Level of perceived stress in the face of phone malfunction, loss and urgency of response

	Ringxiety		Chi square value	P value
	Present No (%)	Absent No (%)		
Takes to classroom				
Yes	114(99.1)	201(93.5)		
No	1(0.9)	14(6.5)		
Total	115(100)	215(100)	5.497	0.019
Uses while driving				
Yes	25(22.5)	31(14.6)		
No	87(77.7)	181(85.4)		
Total	112(100)	212(100)	3	0.08
Uses in library				
Yes	79 (68.7)	118 (55.4)		
No	36 (39.3)	95 (44.6)		
Total	115 (100)	213 (100)	5.5	0.019
Uses while eating				
Yes	83 (72.8)	130 (61)		
No	31 (27.2)	83(39)		
Total	114(100)	213(100)	4.533	0.033
If borrowed money without parents' knowledge for phone use				
Yes	27(23.9)	24(11.4)		
No	86(76.1)	187(88.6)		
Total	113(100)	211(100)	8.696	0.003
Whether students cut sleep to talk on mobile				
Yes	17(14.8)	12(5.6)		
No	98(85.2)	203(94.4)		
Total	115(100)	215(100)	7.915	0.005
Call duration /day in minutes				
≤30	53 (47.7)	100 (49.3)		
31-60	17 (15.4)	49 (24.1)		
61-120	21 (18.9)	30 (14.8)		
≥121	20 (18)	24 (11.8)		
Total	111 (100)	203 (100)	5.414	0.144

**[Table/Fig-4]:** Association of ringxiety with patterns of use



**[Table/Fig-5]:** Proportion of students with and without ringxiety reporting hampered studies

It was found that the students who had ringxiety were significantly more likely to be using mobile phones in the classroom, with 99.1% (114) of them doing so, as compared to 93.5%(201) among the ones who did not suffer from ringxiety ( $p=0.019$ ). Similarly, 68.7% (79) of the students who suffered from ringxiety, used it in the library, as compared to 55.4% (118) who did not have ringxiety and this was significant too ( $p$  value = 0.019). The use of phones while eating was also significantly more among the ringxiety sufferers at 72.8% (83), as compared to 61% (130) among the ones who did not have ringxiety.

A total of 51 (15.2%) students had borrowed money from friends without their parents' knowledge to pay for the phone. When compared between the ringxiety sufferers and others, the former group had more than double the proportion of students borrowing money than the latter (23.9% vs 11.4%) and this was statistically significant ( $p=.003$ ). Though a higher proportion of the ringxiety sufferers also used mobile phones while driving (22.5% vs 14.6%), this difference was not statistically significant ( $p$  value 0.08). The total call duration in a day did not differ significantly between the students who did and did not exhibit the ringxiety symptoms [Table/Fig-4].

The students who had ringxiety were also more likely to report that their studies were hampered due to talking too much on mobile phones at 49.6% (56), as compared to only 29.6% (63) among the ones without ringxiety. This was statistically significant ( $p=.0001$ ) [Table/Fig-5].

## DISCUSSION

Mobile phone use has pervaded into every aspect of the community and it has a special presence in the lives of young, college going students. However, its excessive use and its health effects are relatively new issues that have come forth only in the recent years.

The present study which was done among medical college students revealed that the use of mobile phones was almost universal, as all but one possessed either one or more mobiles. As regards to the people with whom the students communicated the most with their mobiles, a majority of them were found to do so with their

parents. This was similar to the findings of a study which was done among Malaysian college students, where 51% of the students said that they talked most often to either parent [15]. The reason for this in our study could be that a large proportion of the students in our institution were from other parts of the country or the world, and that their parents found it easier to keep in contact with their wards through mobile phones. There was also a significant gender difference in the fact, as to whom the students talked to more, with a higher proportion of the female students talking to their parents and the males talking more to their romantic partners and friends.

The median call duration of 45 minutes which was found in the present study was similar to that which was reported by Zulkefry and Baharudin among the college students in Malaysia, who had a mean talk time of 47 minutes [15]. The proportion of the students who sent messages in high volume (>20/day) in the present study was 41%, as compared to only 13% in a study which was conducted in Sweden [12]. This difference could be due to the fact that theirs was a community based study on young adults and that ours was done on college students. The latter are known to have a culture of messaging, probably due to their classes or to save money. In contrast, the phone call duration was more than an hour in about one third of the students only. Therefore, the negative effects of mobile phones may result from both these functions. Nine out of 10 students used it mostly at night or in the evening. This is plausible, as they would be busy during the daytime, due to their schedule. In fact, this was observed even among school students who were overdoing it to the extent of having daytime tiredness due to the excessive use of mobiles at night [16]. More than half of the participants in the current study also used it in the vibrating or the silent modes at most times, which was good, as it would not disturb others. However, the use of mobile phones at restricted areas was very common, with classrooms topping the list. This could mean that they are too dependent on mobiles and that they could not resist the temptation of using them even where they were prohibited. This was similar to the Britain study which found that 90% of the study subjects carried their phones wherever they went [14]. The amount of money which was spent by the students on mobiles per month was Rs.300/- on an average, which was much lower (56 RM) than that which was spent by Malaysian college goers, which amounted to about Rs.800/-[15]. However, this difference could be due to the difference in purchasing power parity.

The proportion of the students with the symptom of ringxiety was 34.6% in this study, which was more than what was estimated for India in 2007 [9]. However, one must note that there is no comparable literature in India for this figure, as there are hardly any studies which have been done on this subject. The studies from other countries have shown a psychological dependence on mobiles in various groups, though not in terms of 'ringxiety'. In a study which was done on adolescents in Hong Kong, 27.4% of them were classified as mobile phone addicts [7]. A British study showed that 40% of the subjects had admitted that they could not do without their cell phones and that 7% had admitted to either losing a relationship or a job due to their cell phone usage [16]. Among young adults in Sweden, 13% of the males and 22% of the females said they were using mobile phones too much [12]. In a younger sample of Spanish adolescents, 20% admitted to having cell phone dependence [17]. These findings indicate the highly problematic use of mobile phones, which is most likely due to addiction. Mobile phone addiction has been likened to those of compulsive gambling and compulsive video

gaming. The users have been known to get both physical and psychological withdrawal symptoms when they stop using it, like anxiety, restlessness, nervousness and irritability. The symptoms disappear when they start using the phones again [18]. However, unlike compulsive gambling, mobile phones emit electromagnetic radiations that could have an effect on the neurotransmitters and the postsynaptic receptors. Therefore, a neurophysiological basis for the mobile phone addiction cannot be ruled out [18]. Ringxiety, as an indicator of the mobile phone addiction, was further supported by the fact that a similar proportion of students said they would be either very or extremely upset if there was network inaccessibility. Significantly more female students said they would be upset if the mobile phones stopped working, as compared to males. This was in congruence with the findings of other studies that have shown that females were more likely to face the negative consequences of excessive mobile phone use and to feel more stressed if there was an accessibility problem [12,17,19,20]. Further, nine out of 10 students checked their phones several times a day and a similar proportion said that they would immediately replace a lost set.

Regarding the factors which were associated with ringxiety, the students with ringxiety were significantly more likely to use the phone at restricted places like classrooms and the library and while eating. They were also significantly more likely to borrow money from friends without their parents' knowledge, which was similar to the findings of a US study that showed that 67% of the individuals who suffered from ringxiety were paying higher mobile bills than others [9]. The students with ringxiety were also significantly cutting more sleep to talk on their phones, which was also reported in a Belgian study which was done on adolescents who were cutting sleep and getting tired during the day [16]. These associations indicate that there are several patterns of use that indicate the problematic use of mobile phones and this could mean an impending or ongoing addiction. Creating an awareness among the students and their parents alike regarding the mobile phone use may make it easier to identify the condition in the early stages, so that a full blown dependency or a further deterioration can be prevented. The students were already aware of hampered studies, as a significantly higher proportion of ringxiety sufferers complained about it. As of now, mobile phone addiction is relatively uncharted water for medical science; however, with the universality of the mobile phone use, the multiplicity of its functions and such an easy dependency potential, it is high time that it is given priority for further research and intervention.

This study has some limitations; its results may not be representative of the whole community of college goers, as it was done among a specific group of students of a private medical college. Moreover, a majority of the students in the college came from a better socio-economic status. Therefore, their access to and spending on mobile phones may be different from those of other youths. The results are also dependent on the assumption that the students gave honest responses to the questionnaire, as it was self-administered.

## CONCLUSIONS

This study found that the students used mobile phones mostly at night and evening and in the vibrating or the silent modes. They had a high volume messaging habit but the duration of the talk time was not very high. The mobile phone usage had an adverse impact on the students in terms of ringxiety, cutting sleep and hampering studies. They also reported high stress levels in case of a loss of connectivity. These are the findings that signify that mobile phone



dependency is not uncommon among college students. There is a need to further explore the extent and the effects of the mobile phone usage in various groups and to plan intervention measures.

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