



Nomophobia: A Study to Evaluate Mobile Phone Dependence and Impact of Cell Phone on Health

Ashwini S Dongre¹, Ismail F Inamdar², Pragat L Gattani³

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Author's Affiliation:

¹Post PG; ²Associate Professor;
³Professor and Head, Dept of Community Medicine, Dr. Shankarrao Chavan Government Medical College, Nanded

Correspondence

Dr. Ismail F Inamdar
ifinamdar123@gmail.com

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ABSTRACT

Background: "Nomophobia" is the modern fear of being unable to communicate through a mobile phone. It is important to understand how its use affects people's well-being, and the consequences of having the device taken from frequent users. The present study was designed to study the prevalence of nomophobia, dependence pattern and health effects of mobile phone usage.

Objective: The objectives were to study the prevalence of nomophobia among mobile phone users; to study cell phone dependence pattern among adults; and to study the health effects of mobile phone usage.

Methodology: This was a community based cross sectional exploratory study conducted during 1st December 2015 to 1st May 2016.

Results: Most of the subjects were in the age group of 16 - 20 years. The prevalence of nomophobia in the study was 68.92%. A higher proportion of males (82.91%) were dependent on mobile phone compared to females (31.25%). The most common self-perceived symptom due to increase mobile phone usage was lack of sleep (70.61%) followed by eyestrain (42.46%).

Conclusion: Prevention is better than cure, most of the subjects using mobile phone belong to younger age group therefore health education strategies should be targeted to youth to prevent harmful effect of this great invention.

Keywords: Nomophobia, Ringxiety, mobile user

INTRODUCTION

Luxurious inventions available in the market such as portable mobile phone have proved to be a boon in the lives of many individuals.¹ Earlier mobile phone being costly was not used by masses, but due to advances in electronic technology it has become relatively inexpensive and readily available to innumerable individuals. This easy to use device nowadays offer advanced computing capabilities and holds an important place in the day to day life.²

"Nomophobia" is the fear of being unable to communicate through a mobile phone in today's exist-

ing world. The word "nomophobia" originated in England and is derived from the phrase "No Mobile Phobia", that is, the phobia of being without a mobile phone.³ It refers to symptoms like nervousness, discomfort and anxiety caused by being out of contact with a mobile phone. Availability of improved technology is important in development and increase productivity but also carries some hostile impacts along with.² Likewise, mobile phone technology has connected the masses in a magical way but its excessive usage has brought many negative implications.³

Mobile phone technology has evolved rapidly over the past two decades.² Since the start of this mil-

lennium, a standard mobile device has gone from being no more than simple two-way communication device to a sophisticated wireless mobile tool commonly referred to as "smartphones." These mobile phone allow individuals to have unlimited access to information and to connect with others which in turn has led to dependency among users.⁴

Social networking has become one of the largest and most influential components on web, it provides an easy platform for everybody, be it youngsters or the older.¹ Much of youngsters are losing themselves to the virtual world and becoming the slave of technology instead of its mastery.⁵

Nomophobia affecting mental status of the mobile phone users has been proposed to be included in the DSM-V (Diagnostic and Statistical manual of Mental disorders, fifth version) a gold standard manual for assessing psychiatric diseases.⁶

Because of the ubiquitous nature of the mobile phone, it is important to understand how its use affects people's well-being, and the consequences of having the device taken from frequent users. The present study was designed to study the prevalence of nomophobia, dependence pattern and health effects of mobile phone usage.

OBJECTIVES

The objectives of the current research were to study the prevalence of nomophobia among mobile phone users; to study cell phone dependence pattern among mobile phone users; and to study the health hazards of mobile phone among mobile phone users.

MATERIALS AND METHOD

It was a Community based cross sectional, exploratory study. The data was collected from 1st December 2015 to 1st May 2016. This study was conducted in the urban area of Municipal Corporation of Nanded city in Maharashtra, India. The total population of the city was 550439 distributed in 79 Municipal Corporation Wards. The sample size calculated for the present study was 650 taking into consideration the prevalence of nomophobia as 39.5%.⁷ Ethical committee approval was obtained prior to the start of the study from the institutional Ethics Committee of Medical College. All subjects were fully informed about the study and were granted the right to refuse to participate before the study began or at any juncture of the data collection process.

The prevalence of nomophobia in the pilot study was 28% wherein a total of 100 subjects were included. A probability proportional to size with 30

stage cluster sampling method was used.^{10,11} A cumulative list of 79 wards of the municipal corporation with a population of 550,439 was prepared and the first ward was selected from a random start. The sampling interval of 18347 was obtained by dividing the total cumulative population of the wards by the number of wards to be selected (30 clusters in this study). A random number smaller than the sampling interval was selected and fitted into position in the list to identify the first cluster in the sample whose population was greater than the random number. Then by adding the sampling interval to the initial random number, the remaining clusters were selected. From each selected cluster, 22 subjects were enrolled by simple random sampling, usually not more than one member from each household was selected. A total of 650 subjects were thus included, 15 years of age and over and who own a mobile phone.

The study subject were given structured and self-administered questionnaire designed and tested by Agrawal et al.,¹² in English and Marathi where it was not necessary to disclose their name. Questionnaires were pre-tested and necessary amendments were done in the questionnaire following the pre-test. The six criteria for ICD-10 dependence syndrome¹² were covered by 14 questions and subjects were considered to fulfill a particular criterion, if they answered positive to question in criteria containing single question or answered positive to at least 50% questions in case of criteria containing multiple questions. Accordingly, subjects who fulfilled three or more of the criteria for dependence were rated as having Nomophobia. The collected data was transferred into SPSS version 16.0 Statistical Software (IBM, Chicago, USA) for analysis and data was summarized using descriptive statistics by running frequencies and cross tabs. A $P < 0.05$ was considered as statistically significant for the purpose of this study.

RESULTS

For the present study 650 subjects were interviewed. Among them, 72.92% were male (N= 474) and 27.07% were female (N = 176). The mean age of the respondents was 21.23 ± 9.44 years. Table 1 depicts the basic socio demographic characteristics of the study population. Maximum individuals, 51.84% (N = 337) were in the age group 16 - 20 years followed by 29.23% (N = 190) in 21 - 25 years age group. Most of the study subjects 61.07% (N = 397) were single. As far as occupation was concerned, 55.23% (N = 359) of the study population were students, 26.46% (N = 172) were employed.

The prevalence of nomophobia in the present study was 68.92% (N = 448) as per ICD-10 diagnostic criteria for dependence syndrome.

Table 1: Sociodemographic characteristic of the study subjects (N = 650)

Socio-demographic variables	Frequency (f) (%)
Age (Years)	
16 - 20	337 (51.84)
21 - 25	190 (29.23)
26 - 30	91 (14)
31 - 35	20 (3.07)
36 - 40	12 (1.84)
Gender	
Male	474 (72.92)
Female	176 (27.07)
Marital status	
Single	397 (61.07)
Married	253 (38.92)
Religion	
Hindu	269 (41.38)
Muslim	112 (17.23)
Buddhist	242 (37.23)
Others	27 (4.15)
Occupation	
Student	359 (55.23)
Employed	172 (26.46)
Self employed	52 (8)
Homemaker	39 (6)
Unemployed	28 (4.3)
Socioeconomic status*	
Upper	66 (10.15)
Upper middle	256 (39.38)
Lower middle	199 (30.61)
Upper lower	129 (19.84)

* Modified Kuppaswamy's classification

Table 2: Distribution of subject fulfilling ICD-10 diagnostic criteria for dependence syndrome (i.e presence of Nomophobia)

ICD-10 Criteria for Dependence syndrome	Percentage (%)
Intense Desire	19.07
Impaired Control	75.23
Withdrawal	16.92
Tolerance	9.53
Decreased pleasure	67.38
Harmful use	71.53
Nomophobia among mobile phone users (i.e. Participants fulfilling three or more of above six criteria)	68.92

Table 3: Distribution of subject according to use of social media application

Applications	Percentage (%)
WhatsApp	74%
Facebook	56.61%
YouTube	44.30%
Online shopping	36.92%
Taking selfies	10.46%
Others	2.30%

Overall 68.92% of the participants met three or more of the ICD-10 diagnostic criteria for substance dependence. 393 (82.91%) male students,

out of 474, had nomophobia as compared to 55 (31.25%) female subject out of 176. Based on the responses to various questions, ICD-10 criteria was applied. Among the ICD-10 diagnostic criteria most commonly met diagnostic criteria fulfilled was impaired control (75.23%), followed by harmful use (71.53%).74% of them checked their mobile phones more frequently about more than 35 times in a day. A few 31% reported that they carry a mobile phone charger or power bank always with them. False perception of ring also called ringxiety or phantom ringing was experienced by 77% of subjects in our study.

Monthly expenditure among subjects on mobile phone is an important factor which adds to the economic burden of mobile phone among users. Most of the subjects spent between Rupees 500 - 1000 on monthly talk time or calls (68.76%) while (50.61%) subjects spent between Rupees 250 - 500 on internet data recharge.

It is evident from Table 3, that 74% subject reported spending most of the time on WhatsApp application, 10.46% on taking selfies and 2.30% on others which included Skype, Instagram, WeChat and Twitter.

Table 5 shows an association of certain characteristics of subject according to the pattern of mobile phone dependence. Nomophobia was higher among male (82.91%) respondents than female respondents (31.25%). The prevalence of Nomophobia was significantly associated with gender. Similarly, the unmarried (91.18%) respondents had more mobile phone dependence compared with married (33.99%). Nomophobia was found to be higher among smart phone users (83.17%) compared with simple phone users (7.01%), a statistically significant association ($P < 0.0001$). The association between Nomophobia and duration of mobile phone use was not a statistically significant one ($P = 0.93$).Majority of subject with nomophobia belong to upper middle class (78.90%) according to Modified Kuppaswamy's socioeconomic class followed by (76.88%) belongs to lower middle class. This association was statistically significant ($P < 0.0001$).

Table 4: Health hazard of mobile phone among subjects

Main Symptoms	Frequency (f) (%)
Lack of sleep	459 (70.61)
Headache	212 (32.61)
Eyestrain	276 (42.46)
Thumb and shoulder aches	112 (17.23)
Earache	64 (9.84)
Accidents	38 (5.84)

Table 5: Distribution of certain characteristics of subjects according to pattern of mobile phone dependence

Variable	Nomophobia		Total (N = 650)	t-test/ Chi-Square value(df)	P value	Odds ratio (95% CI)
	Present (N = 448) (%)	Absent (N = 202) (%)				
Gender						
Male	393 (82.91)	81 (17.08)	474	159.9 (1)	< 0.0001	10.67 (7.16 - 15.90)
Female	55 (31.25)	121 (68.75)	176			
Marital status						
Single	362 (91.18)	35 (8.81)	397	236.0 (1)	< 0.0001	20.08 (13.02 - 30.99)
Married	86 (33.99)	167 (66.00)	253			
Family type						
Nuclear	159 (63.60)	91 (36.40)	250	53.26 (2)	< 0.0001	-
Joint	231 (82.79)	48 (17.20)	279			
Three generation	58 (47.93)	63 (52.06)	121			
Type of phone						
Smart	440 (83.17)	89 (16.82)	529	257.5 (1)	< 0.0001	65.51 (30.82 - 139.2)
Simple	8 (7.01)	106 (92.98)	114			
Duration of Mobile phone use						
≤ 5 years	252 (68.29)	117 (31.70)	369	0.15 (1)	0.69	0.93 (0.66 - 1.30)
> 5 years	196 (69.75)	85 (30.24)	281			
Average time spent on mobile phone per day (minutes)						
Duration	189.96 ±78.85	51.23±16.92	-	21.717	<0.0000001	-
Socioeconomic status (Modified Kuppaswamy's classification)						
Upper	42 (63.63)	24 (36.36)	66	70.68 (3)	< 0.0001	-
Upper middle	202 (78.90)	54 (21.09)	256			
Lower middle	153 (76.88)	46 (23.11)	199			
Upper lower	51 (39.53)	78 (60.46)	129			

DISCUSSION

Given the ever-increasing amount of time people spend using technology, and the potential deleterious effects such increase can have on health, the present study's investigation on mobile phone dependence pattern and the prevalence of Nomophobia is critically important. Mobile phone usage is not only habit forming, it is also addictive; "possibly the biggest non-drug addiction of the 21st century".¹³The overall prevalence of Nomophobia in our study was 68.92%. This prevalence was comparable with a study on rising concern of nomophobia among Indian Medical students in Indore by Sharma N et al (2015)¹⁴where the prevalence of nomophobia was 73% and a study on mobile phone dependence among college students in Bangalore by Masthi NR et al (2012)¹⁵where the prevalence of nomophobia was 67%. While only 23% of subjects were found to be suffering from nomophobia in the study by Bivin JB et al (2013)¹⁶ conducted to study the pattern of mobile usage among students in Kerala. This rise in prevalence could be due to the fact that mobile phone has become a necessary and unique accessory for everyone, diverse applications and new functionalities incorporated in mobile phones provide novelty seeking individuals a new experience to purchase and enjoy playing these advanced communication tools. The behaviors driven by novelty seeking tend to lose self-control and increase impulsivity and hence dependence on this tool.

The mean age of respondents was 21.23 ± 9.44 years. Similarly, the mean age of the respondents was 24.22 ± 5.02 in the study conducted by Montag et al (2015)¹⁷ to study the problems of mobile phone use. In a study on mobile phone use among resident doctors in a hospital in north India by Aggarwal et al (2012)¹²the mean age of all the respondents was 27.4 ± 2.5 years. The study found that out of 650 subjects, 51.84% (N = 337) were in the age group 16 - 20 years followed by 29.23% (N = 190) in 21 - 25 years age group and 14.00% (N = 91) in 26 - 30 years. Similar findings was found in a study by Kumari A et al (2013)¹⁸conducted among nursing students in Manipal where majority of subjects 50(43.9%) were between 19-20 years of age, 35 (30.7%) subjects were in the age group of 21-22 years and minimum subject belonging to 23-24 years of age. This may be due to increasing trends of use of mobile phone among students. Younger generation is the latest consumer of the mobile phones. Emotional bonding and problem of nomophobia are two sides of coin which describes attachment of students towards cell phone.

In the present study, maximum monthly expenditure on mobile phone was in between 500 - 1000 INR on calls (68.76%) and 250 - 500 INR on internet package (50.61%). In contrast, < 500 INR was spent on total mobile phone usage (93.00%) in a study by Kumari A et al (2013).¹⁸In our study, 74% subject reported spending most of the time on WhatsApp application, 56.61% subject on Face-

book, 44.30% on YouTube, 36.92% on various online shopping applications, 10.46% on taking selfies. Similar findings were reported in a study conducted by Yeboah J et al (2014)¹⁹ to study the impact of WhatsApp usage on students' performance in Ghana and found that 80% of the subject said they used WhatsApp messenger on their phone. Pavithra MB et al (2015)²⁰ also reported 56% used mobile phone for social networking and 2% most frequently used them for taking selfies.

False perception of ring also called ringxiety or phantom ringing has been experienced by 77% of subjects in our study and 64.4% among subjects in study carried out by Mittal A et al (2015).²¹ In contrast, 21% subject experienced ringxiety in a study by Sharma N et al (2015).¹⁴ In a cross sectional study by Acharya JP et al (2013)²² headache (51.50%) was the most common symptom followed by irritability (50.80%) among subjects using mobile phone other health effects included body aches (32.19%), eye strain (36.51%), digital thumb (13.8%). In contrast, our study recorded lack of sleep (70.61%) followed by headache (32.61%), eye strain (42.46%), thumb ache (17.23%) being the most common health hazard due to use of mobile phone. Sharma N et al (2015)¹⁴ also reported headache and lethargy as the most common side effect of mobile phone experienced by 61% of subject. Masthi NR et al (2012)¹⁵ reported lack of sleep among 43% subjects followed by 29% headache, 28% ear ache and 20% neck and thumb pain among mobile phone users.

In our study, more number of male subjects (82.91%) were dependent on mobile phone as compared to 31.25% female subject and this difference was statistically significant ($P < 0.0001$, OR = 10.06, 95% CI = 6.73 - 15.02). Similar findings were found in study by Nikhita CR et al (2015)²³ where mobile phone dependence was significantly associated with male gender ($P = 0.003$, OR=1.91, CI = 1.23-2.99). Another study by Pavithra MB et al (2015)²⁰ concluded 44.8% male subject to be suffering from nomophobia as compared to 33.70% female, but this association was not statistically significant ($P = 0.08$). In our study, mobile phone dependence was higher in subjects within joint family (82.79) compared with other family type and the association was also significantly associated ($P < 0.0001$). In contrast, the finding by Kumari A et al (2013)¹⁸ state that majority of the subjects were from nuclear family 100 (87.7%) and Nikhita CR et al (2015)²³ also concluded that mobile phone dependence was significantly associated with participants living in nuclear families ($P = 0.0012$)

Most of the subjects used mobile phone for less than 5 years and among these 68.29% were dependent on mobile phone, but this association was

not statistically significant ($P = 0.65$). In contrast, study by Bivin JB et al (2013)¹⁶ reported that 91.04% of the study subjects were using mobile phones for more than 3 years. Nikhita CR et al (2015)²³ in their study concluded that mobile phone dependence was significantly associated with increasing number of years of use ($P = 0.004$; OR= 2.4; CI = 1.31-4.55). In present study, nomophobia was significantly associated with the use of smart phones ($P < 0.0001$, OR = 65.51, 95% CI = 30.82 -139.2). In the study by Nikhita CR et al (2015)²³ similar findings were noted with $P < 0.00006$; OR 2.66; CI = 1.63 - 4.35). Most of the subject with nomophobia belong to upper middle class (78.90%) according to Modified Kuppaswamy's socioeconomic class followed by (76.88%) belongs to lower middle class. This association was statistically significant ($P < 0.0001$). However, no other study could be found which showed any association between nomophobia and socioeconomic class.

CONCLUSION

The prevalence of nomophobia in our study was 68.92% as per the ICD-10 diagnostic criteria for dependence syndrome. The mobile phone has been dubbed as one of the biggest non-drug addictions of the 21st century. As observed use of cell phone is increasing and unjustified use may result in problems. Prevention is better than cure, most of the subject using mobile phone belong to younger age group therefore health education strategies should be targeted to youth to prevent harmful effect of this great invention. Though treating inappropriate mobile phone use may just be addressing a symptom, rather than the underlying problem, but there is still a need to recognize these growing trends and the potential for negative consequences of inappropriate mobile phone use in young users.

LIMITATIONS

It is a cross-sectional study based on self-rated questionnaire with dichotomous yes/no responses. There is no consensus validity as yet for Behavioural Dependence Model for mobile phone use since there are no defined ICD-10/DSM (Diagnostic and Statistical Manual of Mental Disorders) criteria for nomophobia. However the new DSM-5th edition has expanded the criteria for Addictive Disorders to include certain non-substance behavioural addictions.²⁴

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