Original Article

Evaluation of nomophobia among medical students using smartphone in north India

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ABSTRACT

Background: Smartphone's popularity has risen to such an extent in recent years that it is unimaginable for the people to stay away from it for a minute. The excessive usage has given rise to a condition termed as nomophobia or a feeling of discomfort or anxiety experienced whenever unable to use the smartphone. The aim of this study was to evaluate nomophobia among medical students who are using smartphones.

Methods: A cross-sectional study was conducted among the undergraduate medical students. A 20-item nomophobia questionnaire was used to assess the prevalence of nomophobia among the students, and also the purpose and in which context smartphone was used was also asked. Data collected were coded and entered into a Microsoft Excel spreadsheet. It was analysed using the Statistical Package for the Social Sciences, version 16, software (SPSS Inc., Chicago, IL, USA). A chi-square test was used to test the association, and $p < 0.05$ was considered significant.

Results: The mean age of the 451 students was 20.7 ± 1.72 years, and the majority were females. Mild nomophobia was seen in 15.5% of the students; 67.2% were having moderate nomophobia, while 17.3% were suffering from severe nomophobia. The overall highest mean score was for 'not able to communicate' dimension of nomophobia and lowest for 'giving up convenience.'

Conclusion: Nomophobia is an emerging behavioural problem which needs attention. It is of serious concern that all medical students were suffering from nomophobia, with varying grade of severity. Increasing awareness regarding the harmful effects of smartphone addiction is needed.

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Introduction

Nomophobia is an abbreviated term used for 'no mobile phone phobia', coined during 2008 by a UK-based research organisation evaluating anxieties suffered by mobile phone users. It was observed that nearly 53% of mobile phone users in Britain tend to be anxious when they 'lose their mobile phone, run out of battery or credit or have no network coverage'.[1] Bragazzi et al.[2] have proposed to include nomophobia in the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-V). Yildirim et al.[3] further suggested that it may be included under situational nomophobia under specific phobia in DSM-V.

By 2019, the users of mobile phones worldwide are expected to pass the five billion mark. The increasing popularity of smartphones has attributed to the growth of mobile market. About 62.9% of the population worldwide already owned a mobile phone in 2016 which would increase to 67% by 2019. By 2014, around 38% of all mobile users were smartphone (SM) users which is expected to reach over 50% by 2018.[4]

Smartphones have increasingly become popular because of its multiple applications such as easy accessibility to information, social connectivity, workplace applications, convenience, mobility and so forth besides making phone calls[5]

In 2017, a survey result showed that 49% of Indians use their mobile phones for visiting a social networking site, while 9% listened to music on their phones.[6]

In recent years, concerns regarding negative consequences of problematic use of SMs have increased.[5]

The present study was conducted with the objective of evaluating nomophobia among undergraduate medical students and SM usage among them.

Materials and Methods

Study design and the participants

A cross-sectional study was conducted among the undergraduate medical students of a government medical college in northern India during August 2017–December 2017.

Since 100 students are admitted in each academic session in the institute, and ideally considering complete enumeration, 500 was considered as the sample size for this study.

Questionnaire

A self-administered questionnaire, which had been developed and previously used by Yildirim et al.[7] was used for data collection. It composed of three main sections which include demographic details, purpose and contexts of using SM and nomophobia questionnaire (NMP-Q) having 20 items. All items in the NMP-Q were rated using a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). Total scores were calculated by summing up responses to each item, resulting in a nomophobia score ranging from 20 to 140, with higher scores corresponding to greater nomophobia severity. NMP-Q scores were interpreted as follows: an NMP-Q score of 20 indicating the absence of nomophobia; an NMP-Q score of >20 to <60

considered as mild; an NMP-Q score of 60 to <100 as moderate and an NMP-Q score ≥100 as severe nomophobia. The 20 items were grouped under four factors or dimensions of nomophobia, namely, not being able to access information, losing connectedness, not being able to communicate and giving up convenience.

The students were explained the purpose of the study, were told that their participation was voluntary and they can quit any time also ensuring them that confidentiality will be maintained.

Inclusion criteria

Students who were having SMs, volunteered to participate and gave written informed consent were included.

Exclusion criteria

Students who did not have SMs were excluded from the study.

Of the total 500 students, 480 students were present on the day the study was conducted. One student was excluded as he did not use SMs and the rest 28 questionnaires were incompletely filled, so finally 451 questionnaires were analysed.

Data collection

Data collected were coded and entered into a Microsoft Excel spreadsheet. It was analysed using the Statistical Package for the Social Sciences, version 16, software (SPSS Inc., Chicago, IL, USA). Descriptive statistics (mean, standard deviation, frequencies and percentages) were used to describe the quantitative and categorical variables. Statistical analysis was performed using a chi-square test, and p value < 0.05 was considered significant.

Ethical approval was obtained from the institutional ethics committee before the commencement of the study.

Results

Of the 451 students, about 70 (15.5%) of the medical students were having mild, 303 (67.2%) moderate and 78 (17.3%) severe nomophobia [Table 1].

The majority of the participants [257 (57.0%)] were in the age group of 20–23 years. The mean age of study participants was 20.7 ± 1.72 years. The female students [280 (62.1%)] outnumbered the male students. The maximum [99 (21.9%)] number of the students was of the fifth semester. The duration

Table 1 – Prevalence of nomophobia among the medical students.

NMP-Q scores	Description	Frequency (N = 451)	Percentage
20	No nomophobia	00	0.0
>20 to <60	Mild nomophobia	70	15.5
60 to <100	Moderate nomophobia	303	67.2
≥100	Severe nomophobia	78	17.3

NMP-Q, nomophobia questionnaire.

of SM use by majority [239 (53.0%)] of the participants was ≥3 years. Four hundred thirty-six (96.7%) students had mobile data plan. Two hundred eighty (62.1%) students spend >3 h on SM. Two hundred sixty (57.6%) students check their SM >10 times/day, while 268 (59.5%) were checking it frequently, i.e., from every 5 min to one hour. Two hundred fifty-four (56.3%) and 248 (55.0%) students made and received calls up to 3 times a day, respectively, while up to 20 messages were sent and received by 287 (63.6%) and 233 (51.7%) students, respectively. Three hundred forty-three (76.1%) medical students had up to 25 apps downloaded in their phone [Table 2].

Among the students, factors such as age (χ^2 = 12.2, p = 0.016), average time spent on SM (χ^2 = 10.5, p = 0.005) and checking SM >10 times/day (χ^2 = 7.99, p = 0.018) and at a frequency of every 5 min to every hour (χ^2 = 7.93, p = 0.019) were found to have a statistically significant association. Also, more than 3 calls made (χ^2 = 14.2, p = 0.001) and received per day (χ^2 = 9.27, p = 0.010) as well as >20 messages sent (χ^2 = 8.21, p = 0.016) and received per day (χ^2 = 7.74, p = 0.021) were some of the other factors having a statistically significant association with mild, moderate and severe nomophobic nature of the students [Table 2].

SMs were used mostly for the purpose of talking to family and friends (93.1%), followed by listening to music, surfing Internet and so forth; 40.4% was using just for killing time.

No doubt that with multitude of uses, SM has become favourite pastime of people as it was mostly used by the students when they were bored (91.4%) or alone (86%), waiting for

Table 2 — Association between nomophobia and variables.

Variables	Nomophobia				χ^2 p value
	Mild, n = 70 (%)	Moderate, n = 303 (%)	Severe, n = 78 (%)	Total, N = 451 (%)	
Age group (years)					
17–20	18 (15.1)	80 (67.2)	21 (17.7)	119 (26.4)	12.2
20–23	38 (14.8)	184 (71.6)	35 (13.6)	257 (57.0)	0.016*
23–26	14 (18.7)	39 (52.0)	22 (29.3)	75 (16.6)	
Gender					
Male	29 (17.0)	109 (63.7)	33 (19.3)	171 (37.9)	1.49
Female	41 (14.6)	194 (69.3)	45 (16.1)	280 (62.1)	0.474
MBBS semester					
First	14 (16.3)	60 (69.8)	12 (13.9)	86 (19.1)	
Third	11 (11.3)	65 (67.7)	20 (20.8)	96 (21.3)	9.38
Fifth	12 (12.1)	75 (75.8)	12 (12.1)	99 (21.9)	0.311
Seventh	19 (19.8)	57 (59.4)	20 (20.8)	96 (21.3)	
Ninth	14 (18.9)	46 (62.2)	14 (18.9)	74 (16.4)	
Duration of SM use					
<3 years	31 (14.6)	145 (68.4)	36 (17.0)	212 (47.0)	0.32
≥3 years	39 (16.3)	158 (66.1)	42 (17.6)	239 (53.0)	0.853
Mobile data plan					
Yes	66 (15.1)	294 (67.5)	76 (17.4)	436 (96.7)	1.5
No	04 (26.7)	09 (60.0)	02 (13.3)	15 (3.3)	0.472
Average time spend on SM (hrs)					
<3	35 (20.5)	117 (68.4)	19 (11.1)	171 (37.9)	10.5
≥3	35 (12.5)	186 (66.4)	59 (21.1)	280 (62.1)	0.005*
Average time you check your SM per day					
Up to 10 times	40 (20.9)	123 (64.4)	28 (14.7)	191 (42.4)	7.99
>10 times	30 (11.5)	180 (69.3)	50 (19.2)	260 (57.6)	0.018*
How often you check your SM (hrs)					
≤1	32 (11.9)	183 (68.3)	53 (19.8)	268 (59.5)	7.95
>1	38 (20.7)	120 (65.6)	25 (13.7)	183 (40.5)	0.019*
Calls made/day					
Up to 3	49 (19.3)	174 (68.5)	31 (12.2)	254 (56.3)	14.2
>3	21 (10.6)	129 (65.5)	47 (23.9)	197 (43.7)	0.001*
Calls received/day					
Up to 3	47 (18.9)	168 (67.8)	33 (13.3)	248 (55.0)	9.27
>3	23 (11.3)	135 (66.5)	45 (22.2)	203 (45.0)	0.010*
Message sent/day					
Up to 20	55 (19.2)	184 (64.4)	47 (16.4)	286 (63.4)	8.21
>20	15 (9.1)	119 (72.1)	31 (18.8)	165 (36.6)	0.016*
Message received/day					
Up to 20	46 (19.7)	153 (65.7)	34 (14.6)	233 (51.7)	7.74
>20	24 (11.0)	150 (68.8)	44 (20.2)	218 (48.3)	0.021*
Smartphone apps					
Up to 25	55 (16.0)	232 (67.6)	56 (16.4)	343 (76.1)	1.06
>25	15 (13.9)	71 (65.7)	22 (20.4)	108 (23.9)	0.587

SM, smartphone.
*Significant at p < 0.05.

someone (74.1%), and so forth. While driving, 3.3% of the students are using SMs, which nowadays has become one of the important causes for accidents [Table 3].

Considering the four factors of nomophobia, medical students showed the overall highest mean score (4.54) for factor 'not being able to communicate' and lowest mean score (3.21) for factor 'giving up convenience' [Table 4].

Discussion

In previous studies conducted among medical students in India, the prevalence of nomophobia was observed to be ranging from 18.5% by Dixit et al.[8] to 73% by Sharma et al.[9] This may be because of the varied method of assessment of nomophobia among researchers.

In the present study, 15.5% of the medical students were having mild, 67.2% moderate and 17.3% severe nomophobia. Ramudu et al.[10] found in their study that 46.4% of the students were normal, 31.3% were at risk of nomophobia and 22.3% were nomophobes while Kanmani et al.[11] reported that 1.2% students were normal, 41.6% were having mild, 42% moderate and 15.2% severe nomophobia.

In the present study, 53% of the students were using SM for ≥3 years. The duration of SM ownership by the medical students in India as reported by Dasgupta et al.[12] was 25% for >2

Table 3 – Purpose and context of using smartphones among medical students.

[a]Purpose of using smartphones	Frequency (N = 451)	Percentage
Check emails	167	37.0
Check lecture notes	239	52.9
Check social media	392	86.9
Gaming	211	46.8
Getting news	280	62.1
Killing time	182	40.4
Internet	396	87.8
Music	416	92.2
Meetings	91	20.2
Talk to family and friends	420	93.1
Text family and friends	384	85.1
[b]Others	60	13.3
[a]Context of using smartphone		
Dinner table	101	22.4
Between class	195	43.2
During class	63	13.9
Restroom	219	48.6
Public transport	323	71.6
Driving	15	3.3
Alone	388	86.0
Bored	412	91.4
Friends	135	29.9
Talking	94	20.8
Waiting	334	74.1
Walking	93	20.6
Watch TV	129	28.6
[c]Others	15	3.3

a Multiple responses.
b Others include clicking photograph, online shopping, downloading movies, project works, and so forth.
c Others include bed time.

Table 4 – Factors of nomophobia and mean score among medical students.

S.N.	Items	Mean	SD
Factor 1: Not being able to access information		**4.27**	**0.76**
1.	I would feel uncomfortable without constant access to information through my smartphone	4.37	1.84
2.	I would be annoyed if I could not look information up on my smartphone when I wanted to do so.	5.05	1.68
3.	Being unable to get the news (e.g., happenings, weather, etc.) on my smartphone would make me nervous	3.23	1.75
4.	I would be annoyed if I could not use my smartphone and/or its capabilities when I wanted to do so.	4.45	1.78
Factor 2: Losing connectedness		**4.03**	**0.54**
5.	Running out of battery in my smartphone would scare me.	4.06	1.94
6.	If I were to run out of credits or hit my monthly data limit, I would panic.	3.58	1.86
7.	If I did not have a data signal or could not connect to Wi-Fi, then I would constantly check to see if I had a signal or could find a Wi-Fi network.	4.57	1.90
8.	If I could not use my smartphone, I would be afraid of getting stranded somewhere.	3.40	1.79
9.	If I could not check my smartphone for a while, I would feel a desire to check it.	4.56	1.67
Factor 3: Not being able to communicate		**4.54**	**0.33**
10.	I would feel anxious because I could not instantly communicate with my family and/or friends.	4.46	2.07
11.	I would be worried because my family and/or friends could not reach me.	4.84	1.78
12.	I would feel nervous because I would not be able to receive text messages and calls.	4.32	1.79
13.	I would be anxious because I could not keep in touch with my family and/or friends.	4.93	1.61
14.	I would be nervous because I could not know if someone had tried to get a hold of me.	4.05	1.76
15.	I would feel anxious because my constant connection to my family and friends would be broken.	4.67	1.77
Factor 4: Giving up convenience		**3.21**	**0.36**
16.	I would be nervous because I would be disconnected from my online identity.	3.08	1.72
17.	I would be uncomfortable because I could not stay up-to-date with social media and online networks.	3.69	1.89
18.	I would feel awkward because I could not check my notifications for updates from my connections and online networks.	3.47	1.79
19.	I would feel anxious because I could not check my email messages.	2.79	1.67
20.	I would feel weird because I would not know what to do.	3.03	1.79

years, while Singh B et al.[13] found that 65% of the students were using mobile phones for 2–5 years, and Alosaimi et al.[5] observed that in Saudi Arabia 82.1% of the students were using SM for >3 years.

In the present study, 62.1% of the students spend ≥3 h on SM, while Gupta et al.[14] reported only 17.8% of the medical students spending >3 h on SM.

In this study, 42.4% students check their SM up to 10 times per day, while in the study by Subba et al.,[15] it was 85.3%.

In our study, statistically significant difference was observed between different age groups and severity of nomophobia, while Alosaimi et al.,[5] Dasgupta et al.[12] and Yildirim et al.[16] found no statistically significant difference.

No statistically significant association was found between the two genders in our study similar to Alosaimi et al.,[5] while Dasgupta et al.[12] and Yildirim et al.[16] observed a statistically significant association between female sex and nomophobic nature.

Duration of SM ownership and nomophobic nature of the students was not statistically significant in the present study. Similar observation was made by Alosaimi et al.[5] and Dasgupta et al.,[12] while Yildirim et al.[16] found this association to be statistically significant.

In our research, more number of hours spent per day using SM was seen as statistically significant factor associated with severity of nomophobic nature of the students. This finding is in congruence with previous studies by Alosaimi et al.[5] and Dasgupta et al.[12]

Among the four factors considered in the NMP-Q, overall highest mean score was observed for 'not able to communicate' and lowest for 'giving up convenience'. The similar observation was made by Yildirim et al.,[16] while Dasgupta et al.[12] observed overall highest mean score relating to the factor of 'not being able to access information'.

Conclusion

It is of serious concern that all the medical students are suffering from nomophobia, with varying grade of severity. Multitude of services provided by SMs has lead to its overuse, resulting in addiction. Increase in awareness generation is required, and students must be counselled regarding judicious use of their SM.

Limitation of the study

Data were collected from the medical students of only one government medical college of the state. Self-administered questionnaires may not exactly represent the true picture.

Future scope of the study

The study can be performed on various other groups such as adolescents, elderly and so forth. Other aspect, such as the impact of SMs on academic achievement, can be elicited.

Conflicts of interest

The authors have none to declare.

REFERENCES

1. Nomophobia is the fear of being out of mobile phone contact and it's the plague of our 24/7 age. Available from: http://www.dailymail.co.uk/news/article-550610. [Last accessed on 2018 Dec 28].
2. Bragazzi NL, Puente GD. A proposal for including nomophobia in the new DSM-V. *Psychol Res Behav Manag.* 2014;7:155–160.
3. Caglar Yildirim. *Exploring the Dimensions of Nomophobia: Developing and Validating a Questionnaire Using Mixed Methods Research.* Graduate Theses and Dissertations; 2014:14005. Available from: https://lib.dr.iastate.edu/etd/14005 [Last accessed on 2018 Jan 29].
4. Available from: https://www.statista.com/statistics/274774/forecast-of-mobile-phone-users-worldwide/ [Last accessed on 2018 Jan 28].
5. Alosaimi FD, Alyahya H, Alshahwan H, Mahyijari AlN, Shaik SA. Smartphone addiction among university students in Riyadh, Saudi Arabia. *Saudi Med J.* 2016;37(6):675–683.
6. Available from: https://www.statista.com/statistics/257048/smartphone-user-penetration-in-india/ [Last accessed on 2018 Jan 28].
7. Yildirim C, Correia AP. Exploring the dimensions of nomophobia: development and validation of a self reported questionnaire. *Comput Hum Behav.* 2015;49:130–137.
8. Dixit S, Shukla H, Bhagwat AK, et al. A study to evaluate mobile phone dependence among students of a medical college and associated hospital of central India. *Indian J Commun Med.* 2010;35:339–341.
9. Sharma N, Sharma P, Sharma N, Wavare RR. Rising concern of nomophobia amongst Indian medical students. *Int J Res Med Sci.* 2015;3:705–707.
10. Ramudu RV, Raj R, Purushothaman M, Reddy KG, Ramana PV. Av study of assessment of mobile phone dependence among medical students in tertiary care teaching hospital. *Indo Am J Pharmaceut Res.* 2015;5(8):2583–2587.
11. Kanmani A, Bhavani U, Maragatham R. Nomophobia — an insight into its psychological aspects in India. *Int J Indian Psychol.* 2017;4(2):1–11.
12. Dasgupta P, Bhattacherjee S, Dasgupta S, Roy JK, Mukherjee A, Biswas R. Nomophobic behaviors among smartphone using medical and engineering students in two colleges of West Bengal. *Indian J Public Health.* 2017;61:199–204.
13. Singh B, Gupta R, Garg R. Mobile Phones; a boon or bane for mankind?- behaviour of medical students. *Int J Innov Res Dev.* 2013;2(4):196–205.
14. Gupta N, Garg S, Arora K. Pattern of mobile phone usage and its effects on psychological health, sleep, and academic performance in students of a medical university. *Ntl J Physiol Pharm Pharmacol.* 2016;6:132–139.
15. Subba SH, Mandelia C, Pathak V, et al. Ringxiety and the mobile phone usage pattern among the students of a medical college in south India. *J Clin Diagn Res.* 2013;7(2):205–209.
16. Yildirim C, Sumuer E, Adnan M, Yildrim S. A growing fear: prevalence of nomophobia among Turkish college students. *Inf Dev.* 2016;32(5):1322–1331.