Prevalence and Association of Nomophobia and Internet Addiction among Students of Professional Program

*Dr. Neha Upadhyai

**Raghav Upadhyai

ABSTRACT

Internet and mobile phones have made this world a smaller place to live in. The connected world using these digital platforms and devices have made endless communications possible, however, with their own perils. Addiction to internet and dependence on mobile phones has led to new forms of pathological and problematic conditions like 'internet addiction' and 'nomophobia'. This paper aims to explore the association of "nomophobia" and "internet addiction" with sub-objectives of measuring the gender difference and years of ownership/usage effect on these conditions. A survey was conducted using Nomophobia Questionnaire (NMP-Q) and Internet Addiction Test (IAT). Three batches of MBA program at a private university in Dehradun were part of the study population (N=558). A total of unique usable responses from 228 (41% response rate) students were received, which were subjected to appropriate non-parametric test due to non-normality of data. 33.3% and 14.4% of the respondents in the study were diagnosed with severe level of nomophobia and significant problems associated with internet addiction respectively. There was a mild association (Spearman's rho r=0.34) between nomophobia and internet addiction. However, gender difference and years of ownership/usage were not affecting both the behaviour. Nomophobia and Internet Addiction are emergent but neglected behaviours with high prevalence need immediate academic attention. Although termed as disorder by many, yet looking them as attachment could be an alternate viewpoint. Further, research is recommended for deeper understanding of these behaviour.

Keywords: Nomophobia, Internet addiction, Post-graduate students.

1. Introduction:

In 1973 when Martin Cooper, a Motorola engineer made first call from the mobile phone he would have never imagined the endless possibilities of connectivity, as people are connected today.

According to a recent report by Statista 62.9% of the world's population own a mobile phone. The smartphone users worldwide are expected to reach 2.7 billion by end of 2019.The credit for proliferation of smartphones also goes to the development of now publicly available technologies like World Wide Web developed by Tim Berners-Lee in 1991.

Mobile internet traffic as a share of total global online traffic in 2017 was 52.64% (Statista). Approximately, 320.57 million people accessed internet through their mobile phones in India. According to The Economic Times (2018)the number of internet users stood at 481 million in Dec, 2017. An estimated 281 million internet daily internet users are in urban and rural India with a penetration of 62% and 53% respectively. Indians spend 89% of their online time on mobile phone and only 11% on the desktop which is highest in the world (The Times of India, 2018). This human-technology interface open doors to gain insights into how society will assimilate the growing trend.

In recent past, the perils associated with this trend namely Nomophobia gained attention of researchers. A study conducted by Securenvoy (2012) revealed that 53 percent of the mobile phone users in London had fear of not having a mobile phone i.e. "nomophobia" (no-mobile-phobia). With the proliferation of smartphones and access to mobile based internet nomophobia can be termed a by-product of human and information & communication technologies (Young, 1998).

The academic literature explains this behaviour as discomfort or anxiety, when out of mobile phone or computer contact (King et.al., 2014) . For the purpose of this study we conceptualize that Nomophobia can occur if one losses a mobile phone, runs out of battery, or no network coverage is available.

On the other hand, similar to addictions like gaming, online pornography, substance dependence & pathological gambling, Internet addiction (Young, 2004) a subset of "technology addiction"also gained attention of researchers. For, the purpose of this study we infer the meaning of Internet addiction from the work of Kimberley S. Young(1998, 2004), who classifies it as an uncontrollable urge, often accompanied by a loss of control, a preoccupation with use, and continued use despite problems the behavior causes.

Despite of insights available through several studies on these behaviours, it remains unclear that if internet addiction is associated with nomophobia? This first of its kind study to identify and ascertain if any association exists between nomophobia and internet addiction, and further

*Assistant Professor, SMIM&HS, SGRR University, Dehradun

**Assistant Progessor, School of Management, IMS Unison University, Dehradun

measure if gender differences and years of smartphone and internet usage effect nomophobia and internet addiction scores among students of a professional post-graduate program.

2. Material and Methods:

(i) Hypothesis:

It is postulated the device on which internet could be used is not addictive lest its functionality is not explored. Mobile based internet services add to the functionality of the smartphone and fuels the addictive behaviour. A compulsive uncontrollable dependence on mobile based internet services leads to nomophobia over the period of time. The following test hypotheses are postulated for the purpose of this study:

Gender difference Hypothesis:

H0a: Nomophobia Score is same across categories of Gender. 1

H0b: Internet Addiction Score is same across categories of Gender. 2

Years of Ownership Hypothesis:

H0c: Nomophobia Score is same across duration of smartphone ownership. 3

H0d: Internet Addiction Score is same across duration of mobile internet usage. 4

Nomophobia and Internet Addiction Score Hypothesis:

H0e: There is no association between scores of Nomophobia and Internet Addiction. 5

(ii) Measures of Internet Addiction:

Internet Addiction Test (IAT) developed by Young(1998)provides a categorical assessment for diagnosis of Internet addiction. A 20 item self-administered Internet addiction test (IAT) on a Likert scale with 1(not at all) and 5 (always) provides a summated score of all items in the scale. Internet users with a score between 70-100 and between 40-69 are classified as having significant and frequent problems respectively. Although the cut off criteria was arbitrary, yet it provides a fairly simplistic method of diagnosis of the addiction. However, behavioral aspects cannot be ascertained from the questionnaire and the moderating effect of cultural context of the user is not being taken into account. IAT has been used for the purpose of this study because of satisfactory internal consistency (Chronbach's alpha of 0.85) and the scale has widely been used.

(iii) Measures of Nomophobia:

Yildirim & Correia (2015) developed a 20 item self-reporting questionnaire (NMP-Q) to measure severity of nomophobia using mixed method research. The instrument measures four factors namely (i) Not being able to access information (ii) Losing connectedness (iii)Not to access information (ii) Losing connectedness (iii)Not

being able to communicate and (iv) Giving up convenience on 20 items rated on a seven point Likert scale (1 = strongly disagree and 7 = strongly agree only at the extreme ends). Summated score of all the items is used to measure the severity on nomophobia. The scores can range from 20-140 where a score of 20 is classified as absence, 21-60 as mild, 61-100 as moderate and 100 plus as severe level of nomophobia. The scale has been selected for the purpose of the study because of good reliability (Chronbach alpha = 0.945) and all-inclusive methodology (mixed-method) adopted for development and validation of scale.

(iv) Data Collection Method

The study population included students of professional post-graduate program. Three batches of MBA (Masters in Business Administration) were selected as sampling frame from a private state university in Dehradun. The sampling elements include 558 students who are in the first and second year of the program along with the students who have passed out is last one year. The sample were contacted through their e-mail using a self-administered e-questionnaire.E-questionnaire is considered to be superior to pencil and paper based questionnaire with respect to completeness of information (Kongsved et.al., 2008). Informed consent from the respondent was taken for participation in the survey with the condition of anonymity of respondents. The instrument carries verbatim questions from IAD and NMP-Q test and question related demographics, years of smartphone and mobile based internet usage. Assuming 50% prevalence with a 5% precision and 95% confidence level the adequate sample size comes out to be 228 respondents in a population of 558 students. Post emailing the survey and two follow-up reminders we were able to receive 228unique responses from the students who agreed to be part of the survey (response rate of 41%).This response rate is above the average response rate for online surveys i.e. 33% (Nulty, 2006).

(v) Data Analysis Strategy

The summated scores of each respondent was calculated which was subjected to test of normality. Not only the categories obtained from the scales, numeric scores obtained for each respondent on both the scales were subjected to further analysis. The data were subjected to analysis in SPSS 23.Based on the assumptions of normality appropriate non-parametric tests were selected for the purpose of analyzing data and testing hypotheses. Mann-Whitney U test were used to measure the gender differences and years of ownership/usage effect on the Nomophobia and Internet Addiction Scores. The association between the categories of Nomophobia and Internet Addiction was tested using Chi-Square statistics and Cramer's V.

3. Results:

Total of 228 respondents participated in the survey out of which 116 (51%) were males and 112 (49%) were females. The mean age of the respondents was 23.14 years (sd. 1.44). There were 59 respondents (26%) from the MBA 2015-17 batch, 70 (31%) respondents from MBA 2016-18 batch and 99 (43%) from the MBA 2017-19 batch. The average years of smartphone ownership and mobile based internet usage were 6.29 (sd. 2.13)and 6.3 (s.d. 2.12) years.

(i) Prevalence of Nomophobia and Internet Addiction:

The study population (table 1) exhibited mild, moderate and severe level of Nomophobia in a proportion of 28.51%, 38.16% and 33.33% respectively. 31.58% of the study population were not addicted to mobile based internet, however, 54.39% and 14.04% of the respondents faced frequent and significant problems with internet addiction.

(ii) Assumption of Normality:

The Kolmogorov- Smirnov test is significant for both NMP-Q score and IAT score (p < 0.5) indicating that the sample is significantly different from the normal distribution (table 2). This demands for use of non-parametric test for hypothesis testing.

Table 1: Prevalence of Nomophobia and Internet Addiction

Nomophobia Categories	N	%age	Internet Addiction Categories	N	%age
Mild	65	28.51	No Problem	72	31.58
Moderate	87	38.16	Frequent Problem	124	54.39
Severe	76	33.33	Significant Problem	32	14.04

Table 2: Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Nomophobia Score	.082	228	.001	.962	228	.000
Internet Addiction Score	.070	228	.009	.981	228	.004

a. Lilliefors Significance Correction

(iii) Gender difference Effect:

Results of the Mann-Whitney U test conclude that Nomophobia score (U=6463, p=0.948) and Internet Addiction Score (U=5954, p=0.277) are same across male and female, thus, we fail to reject the null hypotheses H0a and H0b(No.1 and 2). Further, almost similar mean nomophobia scores of male and female groups have been observed on all factors of NMP-Q scores (table 3) and IAT score separately.

(iv) Years of Usage Effect:

Results of the Mann-Whitney U test conclude that Nomophobia score (U=4942, p=0.921) and Internet Addiction Score (U=5838, p=0.369) are same across the smartphone owners and mobile internet users having upto six years and greater than six years of ownership/usage. Thus, we fail to reject the null hypotheses H0c and H0d (No. 3 and 4).

(v) Trend of Nomophobia and Internet Addiction between the Batches:

Nomophobia severity was significantly affected in the three batches of MBA program H(2)=6.456, p<0.05. However, further probe using Jonchkeere's test revealed no significant trend in the data: as the student progresses to the senior batches, the median nomophobia severity remains almost same, J=9408, z=1.897, r=0.008.

Internet Addiction level was not significantly affected in the three batches of the MBA program H(2)=1.736, p>0.05. Further, Jonchkeere's test revealed no significant trend in the data: as the student progresses to the senior batches, the median internet addiction level remains almost same, J=9413, z=1.168, r=0.122.

(vi) Nomophobia and Internet Addiction Association

The result of the chi square test (table 6) indicate a significant association between the categories of Nomophobia and Internet Addiction severity ? x^2=16.41, p<0.05, thus, rejecting the null hypothesis H0e (No.5). However, Cramer's V value of 0.19 indicate a mild association between the two variables (table 7). Further, analysis of results of the Spearman' rho r=0.34 (table 8) were also significant when calculated on the scores of nomophobia and internet addiction, indicating a mild uphill linear relationship between the variables.

Table 3: Nomophobia Severity * Internet Addiction Problem Cross tabulation

			Internet Addiction Problem			
			No Problem	Frequent Problem	Significant Problem	Total
Nomophobia Severity	Mild	Count	29	32	4	65
		Expected Count	20.5	35.4	9.1	65.0
	Moderate	Count	30	46	11	87
		Expected Count	27.5	47.3	12.2	87.0
	Severe	Count	13	46	17	76
		Expected Count	24.0	41.3	10.7	76.0
Total		Count	72	124	32	228
		Expected Count	72.0	124.0	32.0	228.0

Table 4: Chi-Square Tests

	Value	df	Asymptotic Significance (2 - sided)	Exact Sig. (2 - sided)	Exact Sig. (1 - sided)	Point Probability
Pearson Chi-Square	16.410[a]	4	.003	.002		
Likelihood Ratio	17.209	4	.002	.002		
Fisher's Exact Test	16.634			.002		
Linear-by-Linear Association	15.941[b]	1	.000	.000	.000	.000
N of Valid Cases	228					
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.12.						
b. The standardized statistic is 3.993.						

Table 5: Symmetric Measures

		Value	Asymptotic Standardized Error[a]	Approximate T[b]	Approximate Significance	Exact Significance
Nominal by Nominal	Phi	.268			.003	.002
	Cramer's V	.190			.003	.002
	Contingency Coefficient	.259			.003	.002
Interval by Interval	Pearson's R	.265	.060	4.131	.000[c]	.000
Ordinal by Ordinal	Spearman Correlation	.266	.061	4.147	.000[c]	.000
N of Valid Cases		228				

a. Not assuming the null hypothesis.   b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

Table 6: Non -Parametric Correlations

			Internet Addiction Score	Nomphobia Score
Spearman's rho	Internet Addiction Score	Correlation Coefficient	1.000	.340[**]
		Sig. (2-tailed)	.	.000
		N	228	228
	Nomophobia Score	Correlation Coefficient	.340[**]	1.000
		Sig. (2-tailed)	.000	.
		N	228	228

**. Correlation is significant at the 0.01 level (2-tailed).

4. Discussion

This novel study adds insights on the scant literature available on "nomophobia" and "internet addiction". Although carrying a mobile phone gives a feeling of comfort, yet mobile phone dependent person often encounters lack of control over the environment (Choilz, 2012), feeling of anxiety, fear and insecurity(Katherine & Twist, 2018) when without it and panic attacks (Sharma et.al., 2016) when it is lost. With proliferation of mobile based internet at very economical price and development of various mobile based academic and non-academic applications, the usage of internet is on rise in India. The moderate and severe level of internet addiction might be attributed to increased internet usage.

A vast majority of students of professional program i.e. 78% suffered from nomophobia. The findings corroborate with the results of similar studies conducted on medical students in India (Sharma et.al., 2014; Sharma et.al., 2015, Pavithra, 2015) which revealed that 39.5% of the respondents were nomophobic and 27% were at the verge of developing it while another study revealed that 73% of the respondents were nomophobic.

The findings of this study show that prevalence of nomophobia was same among the gender and years of smartphone ownership which is contrary to the results of the study on Turkish students (Yildirim et.al. (2016). Nonetheless, previous study of Indian students' supports our findings on gender difference effect (Sharma et.al., 2016) , however, mild variation in the nomophobia severity between the three batches was found in our study. This difference in the results could be attributed to the socio-cultural attributes of population under study and the professional program they are undergoing.

Literature stands divided on the prevalence of Internet addiction among adolescents across the world from 1.5 to 11.6% in the study population. The findings of this study indicate severe internet addiction to a tune of 14.04%

which is far higher than that of similar studies (Sharma et.al., 2014; Sharma et.al, 2016) (0.3 and 2.9%) conducted elsewhere of students of other professional program. Nonetheless, Internet addiction is found to be very high i.e. 68.43% for moderate to severe level in our study. Further, results indicate that Internet addiction is not effected by the gender differences and years of ownership/usage.

The results of the study, to a certain degree, indicate a mild association of nomophobia and internet addiction. Only 17 respondents (7%) reported highest level of nomophobia and internet addiction. Nomophobia is triggered due to unavailability of the phone or hindrance in exploring its functionality while internet addiction which depends upon the constant access and usage of the services. Possibly classifying these human-technology interactions might require different outlook. One way could be looking at these human-technology interactions as 'attachment' rather than states of phobia and addiction. Attachment is a sense of security around other's reliability and responsiveness in times of need (Milulincer et.al.2002, Katherine & Twist, 2018), . Future research in this area might shed light on 'attachment to technology' measured as an attitude rather than a disorder.

5. Limitations

The non-response bias is not ruled out in the study as the response rate even after the reminder mail was approximately 40%. The physical form of the questionnaire or using other methods could be used for further study, if it warrants time and cost. We recommend that wider socio-demographic profile of respondents might be insightful in exploring the dimensions of these two behaviours for generalization. A longitudinal study exploring the underlying factors causing these behaviours to develop using a qualitative design is highly recommended. The scales NMP-Q and IAT uses arbitrary cut-offs for the behaviour which might compromise the

categories of severity/problem. It is recommended to rather use the actual score to evaluate a respondent. Nonetheless, classifying and understanding these emergent behaviours need thoughtful attention and fresh view point.

References:

1. King, A. L. S., Valença, A. M., Silva, A. C., Sancassiani, F., Machado, S., & Nardi, A. E. (2014). "Nomophobia": impact of cell phone use interfering with symptoms and emotions of individuals with panic disorder compared with a control group. Clinical practice and epidemiology in mental health: CP & EMH, 10, 28.

2. Hertlein, K. M. (2012). Digital dwelling: Technology in couple and family relationships. Family Relations, 61(3), 374-387.

3. King, A. L. S., Valença, A. M., Silva, A. C., Sancassiani, F., Machado, S., & Nardi, A. E. (2014). "Nomophobia": impact of cell phone use interfering with symptoms and emotions of individuals with panic disorder compared with a control group. Clinical practice and epidemiology in mental health: CP & EMH, 10, 28.

4. Kongsved, S. M., Basnov, M., Holm-Christensen, K., & Hjollund, N. H. (2007). Response rate and completeness of questionnaires: a randomized study of Internet versus paper-and-pencil versions. Journal of medical Internet research, 9(3), e25.

5. MB, Pavithra, Suwarna Madhukumar and Mahadeva Murthy TS. (2015). "A Study of Nomphobia-Mobile Phone Dependence, among Students of Medical College in Bangalore." National Journal of Community Medicine 6.3: 340-344.

6. Mikulincer, M., Florian, V., Cowan, P. A., & Cowan, C. P. (2002). Attachment security in couplerelationships: A systemic model and its implications for family dynamics. Family Process, (2002):41(3), 405-434. doi:10.1111/j.1545-5300.2002.41309.x.

7. Nulty, D. D. (2008). The adequacy of response rates to online and paper surveys: what can be done?. Assessment & evaluation in higher education, 33(3), 301-314..

8. The Economic Times. Internet users in India expected to reach 500 million by June:IAMAI. 20 Feb 2018. <https://economictimes.indiatimes.com/tech/intern et/internet-users-in-india-expected-to-reach-500-million-by-june-iamai/articleshow/63000198.cms? utm_source=contentofinterest&utm_medium=text& utm_campaign=cppst>.

9. The Times of India. We use 90% of online time on phone. 20 April 2018.. <https://timesofindia.india times.com/india/we-use-90-of-online-time-on-phone/articleshow/63837903.cms>.

10. SecurEnvoy. 66% of the population suffer from Nomophobia the fear of being without their phone. 16 February 2012. Retrieved on: 17 May 2018. <https://www.securenvoy.com/blog/2012/02/16/6 6-of-the-population-suffer-from-nomophobia-the-fear-of-being-without-their-phone/>.

11. Sharma, A., Sahu, R., Kasar, P. K., & Sharma, R. (2014). Internet addiction among professional courses students: A study from central India. Int J Med Sci Public Health, 3(9), 1069-73..

12. Sharma, N., Sharma, P., Sharma, N., & Wavare, R. R. (2015). Rising concern of nomophobia amongst Indian medical students. International Journal of Research in Medical Sciences, 3(3), 705-707..

13. Sharma, P., Bharti, A., De Sousa, A. V., & Shah, N. (2016). Internet addiction and its association with psychopathology: a study in school children from Mumbai, India. Natl J Community Med, 7(1), 2-5..

14. Statista (nd.). Mobile internet usage worldwide-Statistics & Facts.Retrievd on. 17 May 2018. <https://www.statista.com/topics/779/mobile-internet/>.

15. Statista (nd.). Number of mobile phone users worldwide from 2013 to 2019 (in billions). Retrieved on: 17 May 2018. <https://www.statista.com/statistics/274774/forecast-of-mobile-phone-users-worldwide/>.

16. Yildirim, C., & Correia, A. P. (2015). Exploring the dimensions of nomophobia: Development and validation of a self-reported questionnaire. Computers in Human Behavior, 49, 130-137..

17. Yildirim, C., Sumuer, E., Adnan, M., & Yildirim, S. (2016). A growing fear: Prevalence of nomophobia among Turkish college students. Information Development, 32(5), 1322-1331..

18. Young, K. S. (1998). Internet addiction: The emergence of a new clinical disorder. Cyberpsychology & behavior, 1(3), 237-244..

19. Young, K. S. (2004). Internet addiction: A new clinical phenomenon and its consequences. American behavioral scientist, 48(4), 402-415..