



Nomophobic Prevalence and Academic Achievement of Higher Secondary Students Practicing Blended Learning during COVID-19 Pandemic

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Smartphone usage for academic and non academic processes increased among the adolescent students, especially among Higher Secondary students. This increased usage developed a kind of addiction among them towards the smartphones and other mobile gadgets. The mode of delivering learning experiences also changed due to the pandemic and this makes the need of the current study.

Aim: To identify the smartphone addiction termed as nomophobia and academic achievement of higher secondary students during blended learning activities which known for the mixing of appropriate theories, methods and technologies to optimise learning in a particular context.

Materials and Methods: A standardised nomophobic rating scale utilised to check the extent of smartphone addiction among the higher secondary students. Their academic achievement is identified using an achievement test in the relevant subject. The higher secondary students from Kerala constitute the population of the current study and 30 among them practicing blended learning activities are selected for the study in a convenient manner.

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Results: The results show that students are more prevalent to the smart phone addiction during the blended learning process. The male students show a higher level of smartphone addiction when compared to their female counterparts while academic achievement does not differ with respect to gender. Locality of the higher secondary students has no significant role on their nomophobic prevalence and academic achievement. Nomophobic prevalence correlated negatively with academic achievement but not at a significant level.

Conclusion: This study reveals the major issues about the need for adequate supervision of adolescent mobile phone usage especially during blended learning. It also emphasises the need and importance of timely interventions from teachers, parents, and professionals as the learning process shifted to blended methods after the pandemic among higher secondary level.

Keywords: Academic achievement; addiction; blended learning; smartphone; nomophobia; higher secondary students.

DEFINITIONS, ACRONYMS, ABBREVIATIONS

NOMOPHOBIC PREVALENCE:

The nomophobic prevalence, that is the extent of smartphone dependency among higher secondary students, is defined in the present study as Nomophobic Rate. Its extent is expressed as high, moderate and low in nomophobic rating scale, depending on the score achieved by the students.

NMPRS: *Nomophobic Rating Scale*

1. INTRODUCTION

The COVID-19 pandemic situation forced the educational system to use the available technology to a maximum extent during the period of lock down for effective teaching learning process. The usage of online platforms for learning experiences increased among the adolescent students especially among higher secondary students. The usage of smartphones increased among them than any other device for online learning experiences [1]. The usage of smartphones favored among the students than any other device. NOMOPHOBIA, which is also known as NO Mobile Phone PhoBIA, is a term used to describe a specific psychological condition in which people are afraid of being cut off from their mobile phone's internet connection or lack of availability of a smart phone is thus developed [1].

Adolescent students preferred smartphones than any other device for educational purposes due to fact that they can use such devices for browsing and engaging with social media in the pretext of academic usage. A variety of facilities including most powerful lenses in camera, plenty of

applications and high speed internet are available in the modern smartphones and all the facilities can be utilized with a high level of privacy. Such usage of smartphones makes the students addicted to gadgets and that affects the educational process and academic achievement. When the parents forced to make the availability of such gadgets for academic purposes, it increased the usage of smartphone among adolescent for non academic purpose too.

Blended learning is utilized more by the education system after the lock down period because the schools are working on a shift system to ensure social distancing. The blended learning approach is robust and the need of the hour [2]. A blended learning system provides facilities to do educational activities at their own pace in online and as well as on offline mode. Some educational activities are done face to face while some are done with the help of online educational platforms.

In this study, the investigator conducted a survey among 30 higher secondary students who were practicing blended learning method for educational activities during last two months. Nomophobic Rating Scale constructed and validated by Elias, J & Mirunalini, M (2021) is utilized to identify the extent of smartphone addiction among the higher secondary students [3]. An achievement test in the science subject also used to identify the academic achievement of the higher secondary students.

Olmsted, S. & Xiao, M. (2019) found a positive correlation between the usages of smartphones with social media usage [4]. Ayar, D., Özalp Gerçeker, G., Özdemir, E. & Bektaş, M. (2018) investigated the effect of Internet usage among nursing students and found a higher positive correlation between social media usage and

nomophobic rate among the nursing students [5].

Yılmaz, R., KaraođlanYılmaz, F., Öztürk, H. &Karademir, T. (2018) conducted a study among secondary school students and the results shows that they have a low degree of nomophobia [6]. Salehan, M &Negahban, A.(2013) reported that all samples which were using the social networking sites showed a positive correlation with their nomophobic rate [7].

Usmani, S., Bhatti, K., Jindal, P., Bharti, A. & Bharti, P. (2021) conducted a study among medical students regarding their internet addiction and found that the students are prevalent to internet addiction and it disturbs their sleep quality and quality of life significantly [8]. Studies conducted by Choksi, S. & Patel, N. (2021) shows that 27% of the students are prevalent to nomophobia and it is related positively with stress, sleep quality and depression among them [9]. Bouilhees,F., Le, LTVH., Mc Donald,S.,Nkhoma,C. &Jandug-Montera,L. (2020) conducted a study in Australia and explored the benefits of blended learning. During their study, the students have reported a positive perception towards blended learning [10]. Study conducted by Kiviniemi, MT. (2014) revealed that there was a significant difference in the academic achievement of students who learned through blended method than the students who undergone traditional academic activities [11].

As the pandemic situation arised, the online platforms utilized for the effective teaching learning process widely. Even before that, blended learning was a technique utilized in several developed countries. The usage of smartphones enhanced among the adolescent when the learning process uses online platforms too. The review of related literature throws light to the fact that there is a need of demand for the study about the effectiveness of blended learning and the influence of online educational activities on smartphone addiction. The investigators are trying to investigate these issues among adolescents with keen interest on academic achievement.

1.1 Objectives of the Study

The following are the major objectives of the current study.

1. To find out the extent of nomophobic prevalence among higher secondary students who practices blended learning.
2. To identify how the gender and locale of the students related to their Smartphone addiction and academic achievement.
3. To find out the relationship between nomophobic prevalence and academic achievement among higher secondary students who practices blended learning.

1.2 Hypotheses

The hypotheses developed for identifying the possible solutions to the objectives are as following.

1. The higher secondary students who practices blended learning have a higher level of nomophobic prevalence.
2. Smartphone addiction and academic achievement have no significant relationship with gender and locale of the higher secondary students.
3. There is no interrelationship between nomophobic prevalence and academic achievement among the higher secondary students who practices blended learning.

2. MATERIALS AND METHOD

2.1 Research Design

Investigators conducted an experimental study among 60 higher secondary students to identify the effectiveness of blended learning. 30 higher secondary students belong to the experimental group and 30 students belong to the control group. The current study is a part of the experimental study, but is a survey conducted among the 30 students who belong to the experimental group only who are undergoing blended learning experiences. The students are selected from a single school that belongs to same academic environments.

2.2 Instrument of the Study

The Nomophobic rating scale for higher secondary students (NMPRS) constructed and validated by Elias,J & Mirunalini,M (2021) is utilized to identify the extent of smartphone addiction among the higher secondary Wrong students [3].

An achievement test in the science subject constructed and validated according to Blooms

Taxonomy used to identify the academic achievement of the higher secondary students. NMPRS is a Likert scale with 5 alternatives and there were 24 items present in the scale. Among these 24 items, 18 were positive and the rest were negative. Reliability of the scale is established with an alpha value 0.812 and validity established by the norms given by Edwards (1983) for item selection [12]. The achievement test consists of a total of 17 items with representation from physics, chemistry and mathematics.

2.3 Data Collection and Data Analysis

The NMPRS given to the experimental group and the scores of the students collected as a Google sheet for analysis. The achievement test also conducted along with this. In achievement test, one score is given to each correct response and the total score is represented in percentage. The scores for each positive and negative item and responses for each item in the NMPRS are given in Table 1.

Ethical clearance number for this study was No. 16872/Ph D K7/ Education/Part Time January 2018 dated 28.12.2017.

Mean value of the smartphone addiction of higher secondary students who are learning through blended learning method was 62.47 with a standard deviation of 15.31. It is identified from the score obtained from the nomophobic rating scale, in which there are 24 items on a five-point scale. So the minimum score achieved in the scale would be 24 and the maximum score achieved in the scale would be 120 with a mid-value 72. The mean value of a score higher than 60.5 (median) indicates the higher secondary students who are undergoing blended learning for academic activities were more prevalent to smartphone addiction.

The mean scores in the NMPRS and Achievement test with respect to gender and locale of the higher secondary students were compared using students t-test. The values and analysis details are given in Tables 2 and 3.

Table 1. Responses and Scores for different items in NMPRS

Response	Score	
	Positive Item	Negative Item
Strongly agree (SA)	5	1
Agree (A)	4	2
Undecided (U)	3	3
Disagree (D)	2	4
Strongly Disagree (SD)	1	5

Table 2. Significance of difference between mean scores of Nomophobic prevalence and Achievement Test of higher secondary students in relation to their gender

Variable	Gender	N	Mean	SD	T	Df	Sig.
Smartphone Addiction	Female	19	57.68	10.27	2.431	28	0.022*
	Male	11	70.72	19.28			
Academic Achievement	Female	19	41.05	15.09	1.666	28	0.107
	Male	11	31.00	15.00			

Table 3. Significance of difference between mean scores of Nomophobic prevalence and Achievement Test of higher secondary students in relation to their locale

Variable	Locale	N	Mean	SD	T	Df	Sig.
Smartphone Addiction	Rural	10	63.2	17.02	0.182	28	0.875
	Urban	20	62.1	14.85			
Academic Achievement	Rural	10	29.3	11.33	2.0	28	0.055
	Urban	20	41.4	17.28			

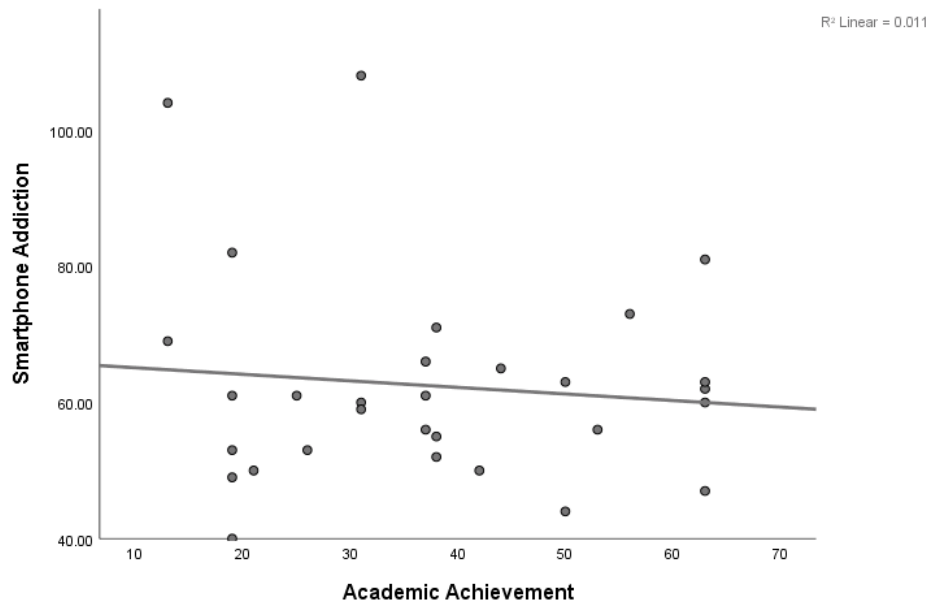


Fig. 1. Scatter plot for correlation between Nomophobic prevalence and Academic achievement of higher secondary students

The value for nomophobic prevalence shows that it is significant at 0.05 level and thus the null hypothesis 2 is rejected with respect to nomophobic prevalence between male and female students. But the tables 2 and 3 show that there is no significant difference between students from rural and urban area with respect to their nomophobic prevalence and academic achievement. Table 2 also reveals that gender do not play any role in the academic achievement.

The Karl Pearson’s correlation between Nomophobic prevalence and academic achievement among higher secondary students who practices blended learning is -0.103. This negative value shows that they are negatively correlated. But the value is very near to zero and the negative correlation is not significant. So we can accept the null hypothesis 3 and conclude nomophobic prevalence not related to academic achievement during blended learning. It is depicted in Fig. 1.

3. RESULTS AND DISCUSSION

The analysis of smartphone addiction which also can be termed as nomophobic prevalence among the experimental group of higher secondary students who are undergoing blended learning method shows that gender plays a role in the smartphone addiction. The higher mean value for nomophobic prevalence among male

students shows that they are more addicted to smartphones. Gender and locale of the students do not play any role in the academic achievement. The results show locality of the higher secondary students not affected their nomophobic prevalence.

The correlation analysis shows that there is a negative correlation between nomophobic prevalence and academic achievement during blended learning but the r value describes that this relation is not significant at 0.05 level.

4. PHARMACOLOGICAL ASPECTS OF THE STUDY

The results show that the nomophobic prevalence is increasing among the students in different aspects. It can be generalised to the whole adolescent. The studies conducted by the members of this investigation team also reveal the same results [1,3]. Nomophobic prevalence also can be considered as similar to nosologomania. All these issues need proper interventions with appropriate pharmaceutical treatments like any other psychiatric disorders. So the need of development of proper medicines and dosage should be explored if the symptoms become more chronic. Further studies should be conducted in pharmacological fields to identify the chemical combination of medicines appropriate to nomophobic prevalence and type of medical interventions for the same.

5. CONCLUSION

The results show that gender has an effect on the nomophobic prevalence of the higher secondary students. Male students have more exposure towards smartphones and this exposure made them more prevalent to nomophobia. Regarding usage of technology, any one may think that rural area have a less priority towards the technological developments, But in the current study, rural and urban students show no significant difference in their nomophobic prevalence, It describes the equal level of smartphone usage among both locale. The correlation analysis reveals the negative effect of nomophobia on the academic achievement of the higher secondary students irrespective of their gender and locale.

As a result of the pandemic, parents' involvement in academic activities has grown like anything before. Because the learning process has transitioned to online platforms, and implemented blended learning to a maximum level at all possible ways, parents and teachers at the higher secondary level should take more care of their wards. The use of gadgets for academic purposes may result in addiction. Studies show that it is comparable to other addictions such as tobacco and alcohol. Thus it is highly recommended that to take precautions before children get addicted.

CONSENT

"All authors declare that 'written informed consent was obtained from the sample for publication of this report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal."

ETHICAL APPROVAL

"All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki."

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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