Nomophobia Unveiled: Predicting Behavioural Regulation Functions

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The present study aimed to investigate nomophobia in Young Adults and its association with behavioural regulation functions. Nomophobia, defined as the fear or anxiety of being without one's mobile phone or being unable to use it, has become a prevalent concern in modern society. In this study, curious minds delved deep into the intricate web of nomophobia, unravelling its profound connection to the behavioural regulation functions in the vibrant realm of young adults. A total of 124 young adults (aged 20-35) were recruited for this study from the city of Rohtak in Haryana. Standardised tools were employed to assess nomophobia and behavioural regulation. The Nomophobia Questionnaire (NMP-Q) was used to measure the severity of nomophobia symptoms, while the Behavioral Rating Inventory for Executive Functions-Adults (BRIEF-A) was utilised to assess participants' ability to regulate their emotions. Results from Pearson's correlation revealed a significant correlation between nomophobia and behavioural regulation functions in young adults, Results infer that those with more pronounced nomophobia symptoms exhibited decreased emotional control. Nomophobia significantly predicted behavioural regulation functions among young adults, particularly inhibiting impulses, shifting cognitive sets, emotional control and self-monitor.

Keywords: Nomophobia; Behavioural regulation; Young adults; Executive functions;

It is an exciting time where technology is everywhere, in every part of our lives. We can't get enough of our smartphones and social media, always wanting to be connected. We're amazed by the latest tech gadgets. Technology is always with us, changing how we work, learn, and have fun. But we must be careful, as this intense love for technology can have good and bad effects on how we communicate, build relationships, get work done, and care for our mental health. As technology advances and permeates various aspects of our lives, society must be vigilant about the potential risks associated with excessive smartphone dependence. The proliferation of the internet and the widespread adoption of smartphones and other connected devices have made it possible for people to connect to the digital world constantly. Mobile gadgets are said to be the most prominent "addiction" of the twenty-first century. Smartphones and smartwatches have become a necessity of daily life (Shambare, 2012). Communication, social interactions, and information access are almost always available at our fingertips. AI (artificial intelligence) driven technologies are transforming daily activities. From virtual assistants like Siri and Alexa to automated customer service and predictive algorithms, AI streamlines processes and decision-making.

Inappropriate use of smartphones can have a detrimental impact on mental health and result in undesirable feelings like extreme anxiety and distress when the smartphone is not available, i.e., nomophobia (Ercengiz et al., 2020); the human brain and associated psychological processes may suffer as a result of excessive or inappropriate usage of these technologies (Pera, 2020). The

phrase "No Mobile Phobia," which refers to the fear of not having a mobile phone, is where the word "nomophobia" originally appeared in England, is a word used to describe a group of mobile phone-related actions or symptoms (King et al., 2014). In other words, "Nomophobia (NO-MOBILE-PHONE-PHOBIA) is the fear or anxiety of being separated from mobile phone contact. It is classified as a disorder of modern digital and virtual society and refers to discomfort, anxiety, nervousness, or anguish brought on by being disconnected from a mobile phone. It falls under the category of technology addiction" (Kanmani, 2017). Numerous characteristics of phobias, including social, physiological, and somatic symptoms, can be distilled into a strong dependence on smartphones (Anshari et al., 2019). Females with Nomo-Phobia symptoms can benefit from using mindfulness treatment, emotion-focused therapy, and cognitive-behavioural therapy to control their emotions. The aforementioned remedies are advised for easing Nomo-Phobia symptoms (Davoudi et al., 2019).

Rationale of the study

With the rapid advancement of technology and the widespread use of smartphones, the phenomenon of nomophobia has become increasingly prevalent, especially among young adults. Young adults are typically early adopters of new technologies and rely heavily on smartphones for various activities, such as communication, social interaction, and entertainment. Therefore, understanding the impact of nomophobia on this specific age group is crucial. Young adulthood is a critical developmental phase characterised by significant identity, independence, and responsibility changes. During this period, young adults are particularly susceptible to the influences of technology on their social, emotional, and cognitive functioning. Investigating the correlation between nomophobia and behavioural regulation in young adults can provide valuable insights into how this specific age group copes with the challenges of technology use. As young adults are at a stage where mental health issues can significantly impact their future well-being, understanding the relationship between nomophobia and behavioural regulation can have important implications for mental health interventions and support systems tailored to this age group.

Objectives

O_1: To study the relationship between nomophobia and behavioural regulation functions (inhibit, shift, emotional control and self-monitor).

O_2: To predict behavioural regulation functions (inhibit, shift, emotional control and self-monitor) from nomophobia in young adults.

Hypotheses

H_1: There would be a negative relationship between nomophobia and behavioural regulation functions (inhibit, shift, emotional control and self-monitor).

H_2: Nomophobia would predict behavioural regulation functions (inhibit, shift, emotional control and self-monitor) in young adults.

Method

Research Design

In the present research study, a correlational design was selected to examine the potential relationships or associations that may exist between variables (nomophobia and behavioural regulation) under investigation.

Sample

A convenient sample of 124 participants was selected for the present study from the

city of Rohtak, Haryana, which included male and female participants within a mean age range of 27.14 years.

Inclusion Criteria

a) Participants have had smartphones or cell phones with internet connectivity for at least six months.

b) Not previously diagnosed with the disorder(s) of executive functions or behavioural regulation.

Measures

Nompphobia Questionnaire: Yildirim and Correia developed and standardised the Nomophobia Questionnaire (NMP-Q) in 2015. The NMP-Q is a 7-point Likert scale that assesses participants' self-perception, ranging from strongly disagree (1) to strongly agree (7). It consists of 20 statements designed to measure the severity of Nomophobia (Yildirim & Correia, 2015).

The BRIEF-A, developed and standardised by Roth et al. in 2005, is a reliable tool for assessing executive functions in adults aged 18 to 90 years and effectively captures how adults handle executive functions (behavioural regulation functions and metacognitive functions) in their daily lives. The self-report version of the BRIEF-A comprises 75 items, organised into nine distinct clinical scales and three validity scales. In the present study, the behavioural regulation Index was used that assess various aspects, including impulse control (Inhibit), task switching and problem-solving flexibility (Shift), and emotional regulation (Emotional Control). Higher scores on the BRIEF-A were associated with difficulties in functions of behavioural regulation. The test-retest correlations for the clinical scales on the Self-Report Form were between .82 and .93 (Roth et al., 2005).

Procedure

The study included 124 young adults, aged between 20 to 35 years, who were recruited from different educational institutions and workplaces in Haryana State. Once a rapport was established with the participants, they were given a questionnaires to assess their levels of nomophobia and executive function skills related to behavioural regulation, specifically inhibiting impulses, shifting cognitive sets, and emotional control. Participants received clear instructions for filling out the questionnaire, and after completion, the filled sheets were collected and scored according to the respective manuals. The data was tabulated in a table for further statistical analysis.

Results

The results of nomophobia in young adults indicate that out of the total sample size of 124 participants, eight individuals reported experiencing mild levels of nomophobia, 101 individuals reported moderate levels, and 15 individuals reported severe levels. This suggests that a majority of the young adults in the study exhibited moderate levels of nomophobia, while a smaller proportion experienced mild or severe levels. These findings highlight the prevalence and varying degrees of nomophobia among young adults, emphasising the need to understand and address this phenomenon in this population (Figure 1).
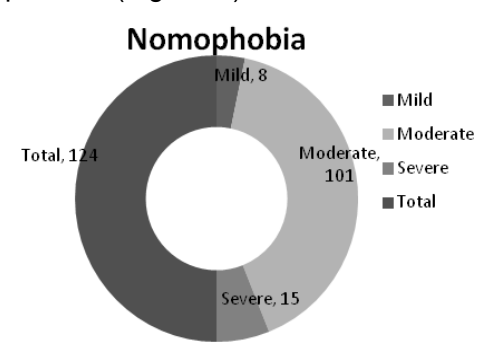

Figure 1. Prevalence of nomophobia (N= 124).

The study included 124 participants and measured their levels of nomophobia and various aspects/functions of behavioural regulation. The participants' mean nomophobia score was 80.85 with a standard deviation of 13.88, indicating a relatively high level of nomophobia in the sample and the variance (192.727) of nomophobia suggests a wide range of scores within the group. Regarding behavioural regulation, the participants achieved an average score of 54.96, with a standard deviation of 7.20. More specifically, their mean score for the "Inhibit" component was 14.50, with a standard deviation of 2.76, while for the "Shift" component, it was 10.80, with a standard deviation of 2.48. These scores indicate moderate levels of behavioural regulation, with some variability among participants. Regarding emotional control and self-monitoring, the participants had mean scores of 18.68 and 10.98, respectively, with corresponding standard deviations (Table 1.).

Table 1. Descriptive Statistics (mean, standard deviation and variance) of nomophobia and behavioural regulation functions.

	N	Mean ± SD	Variance
Nomophobia	124	80.85 ± 13.88	192.727
Behavioural Regulation(overall)		54.96 ± 7.20	51.876
Inhibit		14.50 ± 2.76	7.618
Shift		10.80 ± 2.48	6.162
Emotional Control		18.68 ± 3.44	11.863
Self-monitor		10.98 ± 1.98	3.951

The correlation coefficients between nomophobia and various functions of behavioural regulation indicated the strength and direction of their relationship. Firstly, there was a significant positive correlation between nomophobia and the "Inhibit" ($r = 0.560$, $p < .01$). This suggested that as

nomophobia increased, so did the tendency to struggle with inhibitory control increased i.e., nomophobic young adults had poor inhibitory control that is characterised by challenges in restraining or inhibiting impulsive behaviours, managing urges, or avoiding distractions. Self-regulation may be difficult for those with weak inhibitory control, making it difficult to restrain their impulses, concentrate, and suppress unpleasant or inappropriate actions. Similarly, there was a significant positive correlation between nomophobia and the "Shift", with a correlation coefficient $r = 0.211$ ($p < .05$), indicating that higher levels of nomophobia were associated with difficulties in shifting attention or cognitive flexibility that refers to the challenges faced by individuals with effectively transitioning or adapting their focus or cognitive strategies when faced with changing demands or situations that require mental flexibility. Furthermore, nomophobia showed a significant positive correlation with emotional control ($r = 0.315$, $p < .01$). This indicated that individuals with higher levels of nomophobia may have also experienced challenges in regulating their emotions effectively, i.e., challenges or impairments in effectively regulating and managing emotions. Additionally, there was a significant positive correlation between nomophobia and self-monitoring ($r = 0.221$, $p < .05$), suggesting that individuals with higher levels of nomophobia may have struggled with monitoring and regulating their own behaviours. Lastly, there was a strong positive correlation between nomophobia and overall behavioural regulation ($r = .499$, $p < .01$), implying that higher levels of nomophobia were associated with difficulties in multiple aspects of behavioural regulation. Overall, these results highlighted the significant associations between nomophobia and various functions of behavioural regulation, indicating that individuals with higher levels of nomophobia may have

experienced challenges in inhibitory control, attention shifting, emotional regulation, self-monitoring, and overall behavioural regulation (Table 2).

Table 2. Correlation Matrix for nomophobia and behavioural regulation functions (inhibit, shift, emotional control and self-monitor).

	Nomophobia	Inhibit	Shift	Emotional Control	Self-monitor	Behavioural Regulation
Nomophobia	1					
Inhibit	.560**	1				
Shift	.211*	.440**	1			
Emotional Control	.315**	.249**	.169	1		
Self-monitor	.221*	.314**	.202*	.233**	1	
Behavioural Regulation (overall)	.499**	.740**	.650**	.696**	.577**	1

*Significant at 0.05 level; ** Significant at 0.01 level.

The linear regression analysis examined the predictive relationship between nomophobia and various criterion variables, i.e., "Inhibit," "Shift," "Emotional Control," "Self-monitor," and "Behavioral Regulation" aspects. The coefficient of determination (R^2) values provides information about the proportion of variance in the criterion variables that can be explained by nomophobia. For the "Inhibit", nomophobia accounted for 31.3% of the variance ($R^2 = 0.313$), and the regression coefficient (â) was 0.560 at p< .01. This suggests that nomophobia was a significant predictor of inhibitory control, explaining a substantial portion of the variance. Regarding the "Shift", nomophobia explained only 4.4% of the variance ($R^2 = 0.044$), with a regression coefficient (â) of 0.211 at p< .05, indicating that nomophobia had a predictive

relationship with attention shifting or cognitive flexibility. Nomophobia accounted for 9.9% of the variance ($R^2 = 0.099$) in emotional control, as indicated by a regression coefficient (â) of 0.315 at p< .01. This implies that nomophobia had a predictive association with emotional regulation. In the "Self-monitor" function, nomophobia was found to explain 4.9% of the variance ($R^2 = 0.049$), with a regression coefficient (â) of 0.221(p< .05). These findings suggest that the predictive relationship between nomophobia and self-monitoring abilities was considerable. This indicates that nomophobia was a significant predictor of behavioural regulation, explaining a considerable portion of the variance.

In summary, the results of the linear regression analysis indicated that nomophobia had different levels of predictive power for various functions of behavioural regulation. It was a strong predictor of inhibitory control, a moderate predictor of emotional control, and a relatively weaker predictor of attention shifting and self-monitoring (Table 3).

Table 3. Simple linear regression analysis for predicting behavioural regulation functions (inhibit, shift, emotional control and self-monitor) from nomophobia.

		R^2	β	F	Sig.
Behavioural Regulation Functions	Inhibit	.313	.560	55.662	< .01
	Shift	.044	.211	5.671	<.05
	Emotional Control	.099	.315	13.465	< .01
	Self-monitor	.049	.221	6.293	<.05

The linear regression plot represents the linear regression line and equation (Figure 2).
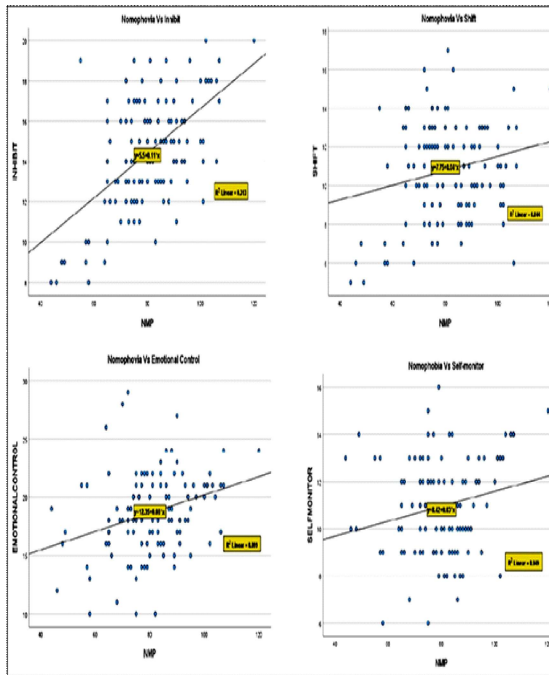
Figure 2. Plots of linear regression of nomophobia with behavioural regulation functions (inhibit, shift, emotional control and self-monitor).

Discussion

Smartphone withdrawal, characterised by an uneasy separation from smart ubiquitous devices, not only increases anxiety but also has a negative impact on various fundamental aspects of executive functions, including cognitive processes such as decision-making, problem-solving, attentional control, and task prioritization (Hartanto & Yang, 2016). Adolescents who engaged in media multitasking experienced more difficulties in their daily lives, particularly in three fundamental dimensions of executive functions: working memory capacity, flexibility of shifting abilities, and inhibition strength (Baumgartner et al., 2014). Internet addicts not only have significant impulsivity and executive dysfunctions, but they also have a comparable amount of disturbance in their everyday life and relationships (Zhou et al., 2014). Excessive smartphone use not only causes problems with emotional regulation and cognitive thinking, but it also fosters an obsession on instant gratification, impeding the development of meaningful interpersonal relationships and impeding one's ability to focus on tasks that require sustained attention and critical thinking (Wilmer, Sherman & Chein, 2017). Excessive use of smartphones not only leads to problems of emotional regulation and cognitive function, but it can also erode interpersonal communication skills, hinder productivity in various aspects of life, and contribute to a sedentary lifestyle that negatively impacts physical health (Clayton, Leshner & Almond, 2015). The severity of distress factors is influenced significantly by both nomophobia and emotional aptitude and skills. Approximately 30% of the variation in depression symptoms, 24% in anxiety symptoms, and 26% in stress symptoms can be attributed to these factors (Santl et al., 2022). In a study, moderator analysis revealed that self-control played a moderating role in the relationship between religiosity and nomophobia, highlighting the significance of self-control as a protective factor when individuals were susceptible to experiencing nomophobia (Afifah & Wijaya, 2022). However, as shown by the Stroop experiment, smartphone addiction dramatically attenuated the detrimental impact of smartphone separation on inhibitory control (Hartanto & Yang, 2016).

Conclusion

In conclusion, this study sheds light on the increasingly prevalent issue of nomophobia among young adults. Nomophobia has emerged as a significant concern in today's technology-driven society. The research has effectively explored the contribution of nomophobia in young adults and the subsequent impact on their behavioural regulation. The study revealed that excessive smartphone usage and reliance on mobile technology adversely affect performance and

emotional control. The findings underscore the importance of recognising and addressing nomophobia as a legitimate psychological concern. As the young adult population continues to immerse itself in the digital world, interventions and preventive measures are necessary to mitigate the potential negative consequences. Furthermore, the study suggests that fostering healthy digital habits and promoting digital literacy among young adults can play a crucial role in combating nomophobia. Psycho-educational programs and awareness campaigns must be implemented to equip young individuals with the skills to manage their smartphone usage responsibly and strike a balance between online and offline experiences.

Hence, this study serves as a wake-up call for counsellors, parents, educators, and policymakers to recognise the impact of excessive smartphone usage on young adults' lives. By addressing nomophobia, we can create a healthier tech-savvy generation that leverages technology responsibly and meaningfully while preserving their mental well-being and social connections.

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