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Smartphone Placebo for Nomophobia: A Quasi-Experimental Study on Smartphone Dependency and Toxicity

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ABSTRACT

Nomophobia, or the fear of being away from a smartphone, has evolved as a growing concern among university students, often linked to smartphone dependency and toxicity. These conditions are associated with anxiety and declined academic performance. This study introduces a novel intervention, the smartphone placebo, as a naturalistic intervention to manage smartphone dependency without requiring complete digital detoxification. Using a quasi-experimental mixed design, 200 undergraduate students were assigned to experimental (n=100) and control (n=100) groups. The intervention involved the use of a smartphone placebo resembling a smartphone in size and function as a smartphone placebo. Data were collected in three phases: baseline time, follow-up time and evaluation time using a structured questionnaire measuring two dimensions: smartphone dependency and smartphone toxicity. Findings from a mixed-design ANOVA revealed a significant reduction in smartphone dependency and digital toxicity over time in the experimental group compared to the control group. The results indicate that a non-digital-based intervention like a smartphone placebo may help regulate digital attachment behaviours and mitigate toxic usage patterns. This study offers practical implications for digital well-being programs in higher education, suggesting the use of symbolic substitutes to manage nomophobia and improve smartphone dependency. The findings contribute to the growing field of digital behaviour intervention by providing evidence for low-cost, non-technological alternatives to digital detox strategies. The study implies that higher education institutions may adopt this

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intervention of using smartphones to promote digital literacy. Future research should consider exploring the importance of smartphone placebo in different demographic and educational contexts.

Keywords: Nomophobia, quasi-experimental, smartphone dependency, smartphone placebo, toxicity

INTRODUCTION

The rise of smartphones in recent years has led to a behavioural phenomenon characterised by nomophobia or fear of being without a smartphone, which significantly affects social interactions. Nomophobia is often intertwined with smartphone dependence, where individuals exhibit compulsive behaviours regarding the use of smartphones. This phenomenon leads to adverse effects such as anxiety, aggression and feelings of solitude (Notara et al., 2021). This interconnection highlights the psychological and behavioural implications of excessive use of smartphones and suggests the need for structured interventions. Tuco et al. (2023) argue that the prevalence of nomophobia among various demographic data, particularly university students, emphasises a collective struggle with technology addiction. The results indicate a correlation between nomophobia and high anxiety levels, suggesting that the constant presence of smartphones generates a state of psychological suffering.

Smartphone dependencies are crucial, affecting not only the individual user but also their social circles. To examine this issue, the inquiry must begin by understanding the dimensional differences between the terms of *smartphone dependency* and *smartphone addiction*. This is due to the overlapping definitions between these two concepts, which often lead to confusion in interpreting the phenomenon. Kim et al. (2023) define smartphone dependency as the active use of smartphones by users to fulfil daily life needs. Based on the Media System Dependency (MSD) Theory by Ball-Rokeach (2008), individuals rely on communication technology to achieve specific goals in their daily lives. These goals include understanding situations, forming communicative relationships with others, and fulfilling the desire for entertainment. This dependence can also lead to digital toxicity, where individuals get involved in negative behaviours such as cyberbullying or social isolation.

In contrast, several researchers have discussed the issue of smartphone addiction (Ratan et al., 2021). According to Fryman and Romine (2021) Specific diagnostic criteria for smartphone addiction have yet to be clearly established. In fact, the use of the term *addiction* to describe excessive smartphone use has sparked various controversies, particularly in the field of health. Shoukat et al. (2025) classifies this addiction as a condition that affects users' psychological and physical well-being, which includes sleep disorders, anxiety, loneliness, fear, and depression.

Consequently, there is a need to explore the concept of a placebo smartphone, which offers intriguing potential in relieving issues associated with nomophobia and smartphone dependency. The placebo effect, traditionally understood in the context of medical treatments, indicates that belief in the effectiveness of non-active intervention can produce tangible benefits (Bartra, 2024). In the domain of smartphone use, a 'smartphone placebo' can be designed to create a technological engagement appearance by minimising real device dependence. Earlier, Padmavathy (2023) proposed the potential of Artificial Intelligence (AI) in nomophobia detection and management. By leveraging advanced technologies, it is possible to identify smartphone dependence patterns, allowing targeted interventions that aim to mitigate the psychological toll of excessive use of smartphones.

Although the concept of a placebo smartphone has a new perspective, it raises questions about the ethical implications of such interventions. As highlighted by Sanna (2024) Understanding the nuances of addictive disorders is fundamental, especially when considering new methodologies for treatment. It is crucial to sail the fine line between providing relief from anxiety and promoting an environment in which individuals feel more dependent on technology. There are a lot of digital detox applications that help with nomophobia and smartphone dependency issues. However, Ferrucci (2025) suggests that psychotherapy can help individuals to navigate their relationship with technology, promoting inner freedom from harmful behaviours. This feeling resonates with the need for a holistic approach that incorporates therapeutic structures along with technological solutions.

The discussion about being overly attached to smartphones is crucial to completely addressing the interconnectivity of nomophobia, dependence and toxicity. Despite growing awareness of smartphone dependency and its psychological implications, including anxiety, social isolation, and digital toxicity, existing interventions primarily focus on behavioural therapies or digital detox apps. However, limited empirical research has examined non-digital, perceptual-based interventions such as the smartphone placebo as a tool to mitigate nomophobia and excessive smartphone engagement through a natural process. While the placebo effect has been widely studied in medical contexts, its application within the domain of smartphone dependency remains underexplored, particularly through experimental designs. Additionally, there is a lack of distinction and clarity between smartphone dependency and addiction, which often leads to conceptual confusion in intervention design. Therefore, this study addresses a critical gap by employing a quasi-experimental design to evaluate the effectiveness of a smartphone placebo intervention in reducing smartphone dependency and toxicity among undergraduate students. It also contributes novel insights by integrating experimental approaches, communication dependency models, and placebo effect frameworks into a single, testable approach.

LITERATURE REVIEW

Nomophobia

The concept of nomophobia was first used in 2008 to define the anxiety of not having a smartphone (Notara et al. 2021). Specifically, the word nomophobia is referred to as a modern phobia and has contributed to the study in communication, psychological and social perspectives. This phenomenon is alarming to the issue of technology dependency, where it has strong correlation between anxiety, dependency and insomnia system (Daraj et al., 2023). Young adults, particularly university students, are among the majority groups who face the issue of technology dependence and distress (Abdoli et al., 2023). Four dimensions of nomophobia conceptualised by Safaria et al. (2022) include inability to communicate, missing connectedness, inability to access information, and giving up convenience.

In the 21st century, smartphone used not only as communication tools but also for social interaction, entertainment and information searching. This has contributed to the anxiety of not having a smartphone, with the intention of staying connected to the social network society (Silmi & Lailiyah, 2024). The continuation of social connectivity through smartphones validates for some users to have anxiety associated with the thought of being disconnected. Specifically to university students, this modern phobia can affect their daily routine as students, as it give implication towards focus span and academic performance (Aslani et al., 2025).

Users with nomophobia issues usually face difficulties in concentration and increased levels of stress and irritability when they are disconnected (Jahrami et al., 2024). This constant dependency contributes to an illusion of security while simultaneously inducing an anxiety which considerably affects physical interaction and well-being. According to Daraj et al. (2023) Being offline, encouraging face-to-face interaction and getting connected to real life are among the ways to avoid nomophobia symptoms.

Smartphone Dependency

The history of the mobile phone industry is important to forecast the relevant solutions related to smartphone dependency. Goggin (2021) highlights the invention of mobile phone technology, which started in the early twenty-first century, when the technology replaced fixed telephones. It went through over 70 years of transformation before smartphones became among the primary tools in communication technology. Earlier, the size and functionality were limited for mobility functions (Oppegaard, 2022). However, with technological advancements and Internet penetration, smartphones have become practical to facilitate human communication in everyday life activities. Users connected to smartphones to get news, information and data. These goals are considered basic needs that contribute to the dependency of users on smartphones to fulfil their life goals (Ball-Rokeach, 2008).

This situation is classified as 24/7 consumption, which Crary (2022) argue

as a digital capitalism phenomenon around the clock. The word omnipresent is used by Harmon and Duffy (2022) is relevant to this phenomenon where the ability of smartphones to function anywhere and at any time, representing human communication non-stop. Hammoud et al. (2021) argue that this situation has a direct relationship to time and space, where smartphone technology and Internet usage allow users to be dependent anywhere and at any time.

Digital Toxicity and Smartphone

Overly connected to communication technology like smartphones not only contributes to dependency issues, but also raises concerns in the form of digital toxicity. Kaun (2021) argue that users should have the freedom to disconnect from technology usage to stop the intoxication of technology from becoming toxicity. The advancement of technologies, which includes the integration of Artificial Intelligence, augmented reality, virtual reality and mobile applications, has resulted in users having difficulty disconnecting from technology like smartphones (Findlay, 2023). Earlier Bull (2007) used the term toxicity to define negative effects and moments that occur when a user is overly connected to technology.

However, Bull (2007) was suggesting that toxicity should be explained carefully, as it can also be defined positively. Playing video games has frequently been described as compulsive behaviour, which need not be equated with any detrimental social attribute or harmful effect. For example, the idea of inability to stop reading a novel can be considered as toxicity from a positive perspective. There are three elements of negative toxicity suggested by Bull (2007). The first form of toxicity is the inability of a user to stay away from the device. The second form of toxicity is the situation in which users do not view their tethering to their device as a problem. Third, toxicity can refer to the damage of a physical nature that can occur by privatising public spaces (Leclercq & Pojani, 2023).

Smartphone Placebo

As a reaction to the phenomenon of being overly connected, Bartra (2024) used the placebo effect term as an intervention for addiction and technology dependency. From a medical perspective, a placebo can be defined as a situation in which an individual's physical or mental state appears to improve after experiencing a dummy treatment (Benedetti, 2021). From a communication perspective, the term ‘smartphone placebo’ can be conceptualised as a psychological phenomenon where users experience a perceived improvement in their well-being or cognitive abilities due to the belief that they are using a functional smartphone, even if the device is not actually operational or connected to a network.

This concept is related to the placebo effect, which is a psychological phenomenon where a person experiences a real improvement in their symptoms or condition simply because they believe they are receiving treatment, even if the treatment has no therapeutic effect.

In the context of a smartphone placebo, users may feel more secure, connected, or productive simply by having a smartphone in their hands, even if the phone is dummy and not capable of making calls, accessing the internet, or performing other typical functions. (Stalujanis et al., 2021). The placebo effect in this scenario can be attributed to the psychological association people have with smartphones in terms of communication, social connection, and productivity.

Placebo interventions are commonly argued through different areas of expectancy and mechanisms. From the perspective of behaviour, Benedetti (2021) argues that humans may experience behavioural or psychological changes when they believe that a particular intervention has the possibility of producing an outcome. This situation applies even when the process itself contains no active therapeutic element. In this context of smartphone dependency, the smartphone placebo may function as a symbolic substitute smartphone that can satisfies users who perceived need for smartphone usage and connectivity. The physical presence of this smartphone placebo may give effects to reduce the fear of being away from a real smartphone that also associated with the issue of nomophobia and smartphone dependency. This has a significant relation to the concept of digital detox (Radtke et al., 2022).

The concept of digital detox has been viewed as an important reaction to this phenomenon, so that the term became an official phrase and was added to the Oxford English Dictionary (OED) in 2013. As defined by Hager et al. (2023), the phrase " digital detox can be explained as a period of time during which users decide to disconnect from using electronic devices such as smartphones, to reduce stress or focus on social interaction in the real world. Suggested by Kocoglu et al. (2024) As a digital diet, this concept is not about totally cutting out the use of technology, but it is one of the healthier approaches in helping users to control their dependency on digital technology. Similarly, Brubaker (2022) used the term disconnectionist to describe the desire for authenticity and to be real.

METHODOLOGY

This study used a combination of experimental and quantitative methodologies, which are appropriate to measure the objective of this research in examining the effectiveness of a smartphone placebo in reducing smartphone dependency and smartphone toxicity among university students during lecture sessions. Both variables, which were conceptualised as smartphone dependency and toxicity, were quantitatively measured using a structured questionnaire. By employing a quasi-experimental design, this research design involved two groups of participants. The first one is referred to as an experimental group, and the second one is referred to as a control group, with the intention of comparing the outcomes (Creswell, 2002).

A total of 200 undergraduate students from the Faculty of Communication and Media Studies, Universiti Teknologi MARA (UiTM), were involved as participants

for this study. They were representing eight classes from various communication subjects. UiTM students were chosen based on both convenience and relevance to the research focus. As one of Malaysia's largest public universities with a digitally active student population, UiTM offers access to a demographic that is highly integrated into mobile technology culture.

Initially, participants were randomly assigned to a different set of groups, either representing the experimental or control group, based on class allocation. To control the procedures, there were four classes designated as the experimental group, while the remaining four were categorised as the control group. Students in the experimental group were given a smartphone placebo and were required to place their actual smartphone in a designated box during lecture sessions. In contrast, the control group continued with their lectures without any intervention of a smartphone placebo.

In the process of measuring both variables, three time points were employed and referred to as (i.e., Baseline Time), (i.e., Follow-up Time) and (i.e., Evaluation Time). Baseline Time refers to the initial day of the lecture session, where subsequent measurements were taken at two-week intervals, which are referred to as Follow-up Time and again at four weeks to assess changes over time, referred to as Evaluation Time. To measure both variables, a structured questionnaire was employed. Smartphone Toxicity was assessed using 20 items, while Smartphone Dependency was measured with 10 items. All items used a 7-point Likert scale ranging from 1 ("Extremely Disagree") to 7 ("Strongly Agree"). Summated scores were calculated for each variable: Smartphone Toxicity scores ranged from 20 to 140, and Smartphone Dependency scores ranged from 10 to 70. Higher scores indicated greater levels of smartphone toxicity or dependency, respectively.

For the statistical analysis, a Mixed Design ANOVA was employed to assess the effects of three time points (i.e., Repeated Measures Element), group effects (i.e., Cross-Sectional Element), as well as interaction effects simultaneously (Field, 2009). As the study involved two main variables, two separate Mixed Design ANOVAs were conducted, following the approach suggested by Ahmad Sharoni et al. (2018). According to Montgomery (2017) When sample sizes exceed 30, data can be considered approximately normally distributed by using the Central Limit Theorem. Thus, with each group comprising 100 participants, the data in this study can be assumed to follow a normal distribution. Moreover, Mixed Design ANOVA is generally robust to violations of normality assumptions, as it is grounded in the principles of ANOVA (Montgomery, 2017). To assess the equality of covariance matrices, Box's Test was conducted (Field, 2009). However, Mixed Design ANOVA is also considered robust to violations of this assumption when group sizes are equal. Given that both the experimental and control groups included 100 participants each, the results of the analysis can be considered statistically valid.

RESULTS AND DISCUSSION

Findings of the Study

Table 1 shows the test-retest reliability analysis for both variables by using correlation analysis. This type of reliability assessment examines the consistency of the relationship between variables across different time points. The instruments used to measure both variables demonstrated good reliability over time, as the correlation coefficients indicated a strong relationship (Cohen, 2013). Additionally, Cronbach's Alpha reliability analysis was conducted for both variables across the time frames. As shown in Table 2, all Cronbach's Alpha values exceeded .70, suggesting that the instruments used were acceptably reliable across time (Cronbach, 1971).

Referring to Table 3, the descriptive analysis indicates that the scores for both variables decreased from the baseline to the follow-up period and continued to decline from the follow-up to the evaluation period. These decrement values occurred for the experiment group, where the Smartphone Placebo was implemented for each respondent. In contrast, the scores for both variables in the control group remained consistently high, with only minor variations across the three time points. Figure 1 and Figure 2 illustrate the linear plots of time effects for each variable across both groups.

Table 4 shows the summary results of the equality of error variance test using two methods, which are Levene's Test and Hartley's F-Max Ratio Test. Based on Levene's Test, it can be considered that the majority of variables with respect to their time group do not have an equal error variance across the experiment and control groups since Levene's statistic was significant at least at 5% of probability.

Table 1
Test-retest reliability analysis using correlation analysis

	Baseline Time	Follow-up Time	Evaluation Time
Baseline Time	**1**		
Follow-up Time	0.796** (0.633**)	**1**	
Evaluation Time	0.748** (0.639**)	0.783** (.690**)	1

Note. The bracket values refer to the correlation coefficient for the Smartphone Dependency, whereas values without brackets refer to the Smartphone Toxicity correlation coefficient; n = 200; **p <.01

Table 2
Cronbach's alpha reliability analysis

	Smartphone Toxicity	Smartphone Dependency
Baseline Time	0.752	0.736
Follow-up Time	0.789	0.745
Evaluation Time	0.796	0.765

Table 3
Descriptive analysis of baseline-test, follow-up-test, and evaluation-test for the variables

Variable	Group	Baseline (M ± SD)	Follow Up (M ± SD)	Evaluation (M ± SD)
Smartphone Toxicity	Experiment	122.23 ± 9.30	80.70 ± 8.61	77.22 ± 7.11
	Control	124.27 ± 8.90	129.58 ± 5.24	129.38 ± 4.43
Smartphone Dependency	Experiment	59.24 ± 5.41	49.54 ± 5.40	38.91 ± 3.08
	Control	60.55 ± 4.45	61.03 ± 3.94	61.78 ± 3.90

Note. M = Mean; SD = Standard Deviation; n (Experiment) = 100; n (control) = 100

Table 4
Test of equality of error variance for group effect test

Variable	Time	Hartley's F-Max Ratio[a]	Levene's Test (p-value)
Smartphone Toxicity	Baseline	86.462 / 79.149 = 1.092	1.112 (.293)
	Follow Up	74.091 / 27.458 = 2.698	28.353 (<.01)
	Evaluation	50.476 / 19.652 = 2.568	29.010 (<.01)
Smartphone Dependency	Baseline	29.255 / 19.785 = 1.479	5.921 (.016)
	Follow Up	29.200 / 15.504 = 1.883	12.202 (.001)
	Evaluation	15.224 / 9.477 = 1.606	1.534 (.217)

Note. [a]It is a ratio of the variance between the group with the biggest variance and the group of the smallest variance, where the groups are Experiment and Control

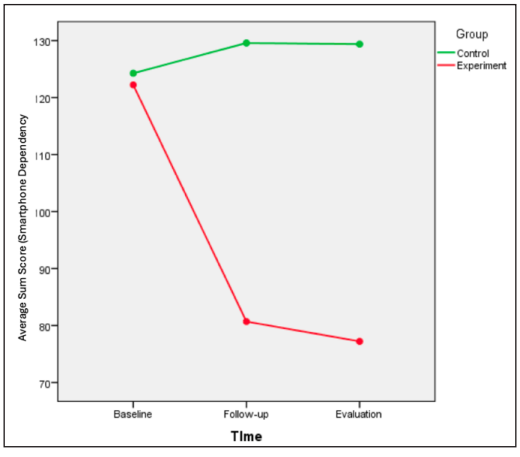

Figure 1. Linear plot of time versus average sum score of smartphone toxicity across experiment and control groups

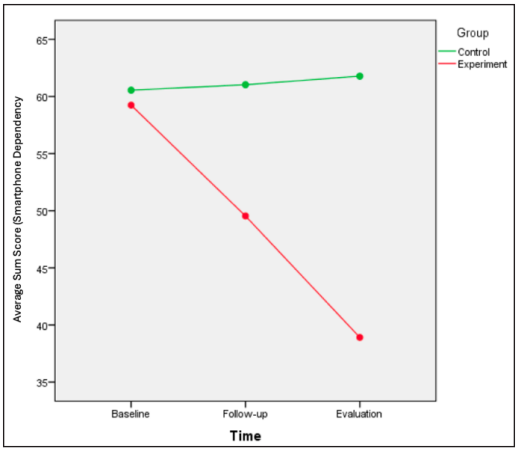

Figure 2. Linear plot of time versus average sum score of smartphone dependency across experiment and control groups

However, according to Pallant (2010), this Levene's Test was a sensitive test. According to them, Hartley's F-Max Ratio test statistic can be considered to produce a more robust test when the sample size is large. Based on Hartley's F-Max Ratio test, all the interested variables can be considered to have an equal error variance across the groups for each time effect, since the ratio was less than 3.00 for large sample sizes (Field, 2009). Therefore, it can be concluded that the error variance for each variable in each time factor can be considered equal across groups.

Table 5 shows the summary results of the mixed designs ANOVA analysis. The assumption of sphericity using the Mauchly's test indicated that, the sphericity assumption was not met for the Smartphone Toxicity (Mauchly's Statistics = 0.538, $p < .01$), and Smartphone Dependency (Mauchly's Statistics = 0.918, $p < .01$), hence Greenhouse-Geisser test statistic adjustment was used since the Mauchly's statistic was below than 0.75, but Huynh-Feldt test statistic adjustment was used if the Mauchly's statistic was above than 0.75 (Coakes et al., 2009). On the other hand, the group effect analysis, the conventional F-test was used since the assumption of equality of error variance across experimental and control groups was met (i.e., refer to Table 4).

Based on the results reported in Table 5, the Smartphone Toxicity scores showed statistically significant changes across the three-time effects (Smartphone Toxicity = 22.39, $p < .01$, $\eta^2 = .775$). Besides that, the analysis also indicated that the interaction effect between Smartphone Toxicity and Group (Smartphone Toxicity *Group = 23.24, $p < .01$; $\eta^2 = .848$), hence it is indicated that the Smartphone Toxicity score differed in experiment and control groups across the time effects. In addition, the group effect was also significant (Group Effect = 25.27, $p < .01$; $\eta^2 = .902$). Hence, the Smartphone Toxicity score for both groups was statistically significant differ.

In terms of Smartphone Dependency, the mixed designs ANOVA indicated that the Smartphone Dependency score was also significantly changed across these three-time effects (Smartphone Dependency = 39.06, $p < .01$; $\eta^2 = .840$). Besides that, the Smartphone Dependency also differed in experiment and control groups across time effects, since the interaction effect between Smartphone Dependency and Group effect was significant (Smartphone Dependency*Group = 32.79, $p < .01$, $\eta^2 = .870$). Besides that, the Smartphone Dependency score was also statistically significant differ between the experiment and control groups since the group effect test was significant (Group Effect = 25.41, $p < .01$; $\eta^2 = .680$).

Table 6 shows the specific analysis in terms of comparison analysis among the time effects. The analysis indicated that all variable scores were statistically significant decrease (i.e. all p-values < .05 and 95% confidence interval does not include zero). Hence, the reduction scores from baseline time up to evaluation time, follow-up

score to evaluation score were statistically significant. Therefore, it can be concluded that the Smartphone Placebo intervention can be described as an effective method for reducing the levels of Smartphone Toxicity and Smartphone Dependency.

Table 5
Result of mixed-design analysis for the variables

Variable	Mauchly's Test of Sphericity	Test Statistics[a]	Effect Size[b]
Smartphone Toxicity	0.538**	22.39**	.775
Smartphone Toxicity *Group		23.24**	.848
Group Effect	N/A	F (1,198) = 25.27**	.902
Smartphone Dependency	0.918**	39.06**	.840
Smartphone Dependency *Group		32.79**	.870
Group Effect	N/A	F (1,198) = 25.41**	.680

Note. [a]Since Mauchly's Test of Sphericity was significant, the Greenhouse-Geisser test statistic adjustment was used if the value of Mauchly's estimates of sphericity was less than 0.75, whereas the Huynh-Feldt test statistic was used if the value of Mauchly's estimates of sphericity was above 0.75. For the Group Effect test statistics, the conventional F test was used; [b]The Partial Eta Square (η^2) was used to estimate the effect size of the test; N/A = Not Applicable; **p <.01; *p <.05

Table 6
Multiple comparison analysis for pairwise comparisons

Variable	Multiple Comparison Analysis[a]			95% Confidence Interval[a]		
	Baseline - Follow Up	Follow Up - Evaluation	Baseline - Evaluation	Baseline - Follow Up	Follow Up - Evaluation	Baseline - Evaluation
Smartphone Toxicity	18.11**	1.84**	19.95**	(16.47, 19.75)	(1.021, 2.659)	(18.25, 21.65)
Smartphone Dependency	4.61**	4.94**	9.55**	(4.15, 5.07)	(4.46, 5.42)	(8.98, 10.12)

Note. [a]The Bonferroni Adjustment method of multiple comparison analysis was used; [a]Value reported in the multiple comparison analysis is a mean difference value; **p <.01

Discussion of the Study

Therefore, it can be suggested that employing the smartphone placebo intervention serves as an effective strategy for addressing nomophobia concerns and plays a role in reducing both smartphone dependency and smartphone toxicity among university students. The study underscores the importance of understanding toxicity in relation to the various forms of consumption and technology represented by smartphones among university

students. In the modern age, where internet connectivity is integral to daily life, users are expected to be closely connected to technology, contributing to the always-on culture.

The findings are consistent with previous studies on placebo psychology and digital behaviour interventions. According to Benedetti (2021), placebo effects may influence behavioural outcomes through various psychological mechanisms, even when the intervention itself contains no active therapeutic element. In the present study, the smartphone placebo served as a symbolic intervention rather than an active treatment. The findings suggest that the smartphone placebo may have provided participants with a perceived sense of connectivity, thereby reducing the anxiety associated with smartphone separation. This explanation supports the notion that psychological reassurance and expectancy effects may contribute to reductions in smartphone dependency and digital toxicity. Similarly, this condition is also consistent with the findings by Radtke et al. (2022), which the findings suggested that interventions encouraging reduced smartphone engagement can improve awareness of technology use and support healthier digital habits.

The transformation of conversation into connection has privatised public space, challenged the notion of separating offline and online worlds and given rise to the concept of Smartphone dependency. In the context of a smartphone placebo, university students may experience a sense of security, connection, or productivity simply by holding a non-functional phone, attributing this placebo effect to the psychological association with smartphones in terms of communication, social connection, and productivity, which aligns with the concept of digital detox. Consequently, the placebo effect works to improve users' cognitive abilities due to the belief that they are using a functional Smartphone, even if the device is a dummy or not actually operational or connected to a network.

Living in a society surrounded by network advancements and softwarisation, users who disconnect may eventually seek to reconnect. Digital detoxing, while seen as a reaction to reassess one's relationship with technology, does not necessarily lead to greater authenticity. Users actively participate in this situation, and they must be mindful of their technology usage to avoid becoming excessively tethered to it. As technologies like smartphones are not neutral objects that can be easily detoxed from, users play a crucial role in managing their relationships with these devices in everyday life. With the convergence of the Industrial Age, Information Age, and AI, users must be attentive to their technology usage in this evolving landscape. They should recognise when it is appropriate to disconnect and return to real-life interactions, where genuine human connection takes place.

The prevalence of smartphone dependence among university students emerged as a significant concern for educators, mental health professionals,

and advocates to consider smartphones as a placebo intervention to this problem. These interventions provide an innovative approach to improve digital well -being, while mitigating the negative effects of the excessive use of smartphones.

The intervention often takes on the form of smartphone applications that simulate the functionality of existing smartphone applications without the typical distractions associated with social media and games. However, this study has demonstrated through a non-pharmacological alternative approach to help students manage smartphone dependency. Through an application of smartphone placebo as a symbolic intervention, this research contributes to novel findings, which include a practical method of mitigating smartphone dependency and digital toxicity in the form of smartphone placebo.

By providing a controlled environment, these interventions allow educators and mental health professionals to teach students the boundaries of healthier usage of communication technology. Students can perceive this intervention as authentic tools, thus encouraging a change in their relationship with technology. This perception allows a reconfiguration of addiction in a more manageable paradigm, promoting resilience against the impulse to abuse smartphones in university.

The sample used was limited to a group of undergraduate students from a single public university. This setting may affect the generalisability of the findings to other sets of populations, such as young adults in different contexts of institutions. Considering this, future studies should extend to a more diverse set of samples across different sets of demographic backgrounds with the objective of enhancing external validity. Overall, future research should also aim to refine the intervention model, explore its adaptability in different environments, not limited to the university context, and examine its integration with other psychological or behavioural therapies for digital wellness.

CONCLUSION

Smartphone technology and its consumption need to be understood in relation to the issue of nomophobia. By analysing the critical theorisation and understanding the relevant literature on the consumption of smartphone technology, this study has expanded the concept of nomophobia, smartphone dependency, smartphone toxicity and smartphone placebo in mobile network society. Living in today's digital world with massive connectivity has created an expectation for users, especially university students, to be connected 24/7, and this has caused users to be affected by nomophobia. Since more devices are and will be connected to the Internet, exceeding the population, the absence of smartphones in the classroom might result in users experiencing the feeling of missing out on their networked society. While the findings mostly portray negative experiences, these only apply to users who are overly attached to their smartphones. This strengthens a statement of smartphone

toxicity in which users do not experience being overly connected as an issue, but they view it as pleasurable.

Indeed, users need to reflect and get the awareness to disconnect from the digital environment at appropriate times and reconnect with face-to-face interactions. By applying this placebo effect, users will be able to revisit their relationship with technology usage by fostering an authentic human relationship. This intervention helps users to have a conscious shift back to offline communication, which is now crucial in preventing social detachment and emotional fatigue contributed by excessive digital dependency. This study offers practical implications for digital well-being programs in higher education, suggesting the use of symbolic substitutes to manage nomophobia and improve smartphone dependency. The findings contribute to the growing field of digital behaviour intervention by providing evidence for low-cost, non-technological alternatives to digital detox strategies.

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