The Journal of Mind and Behavior
Spring 2025, Volume 46, Number 2
Pages 266–281
ISSN 0271–0137

The Influence of Mobile Phone Abuse on Mental Wellbeing Conditions: The Mediating and Moderating Role of Self-Control Dual System

Wei Tian*

Universiti Utara Malaysia, Sintok, 06010, Kedah,Malaysia

Nor A'tikah binti Mat Ali

Universiti Utara Malaysia, Sintok, 06010, Kedah,Malaysia

Suzila Binti Ismail

Universiti Utara Malaysia, Sintok, 06010, Kedah,Malaysia

The prevalence of mobile phone misuse among college students is increasingly concerning as smartphone access becomes more widespread, with numerous adverse consequences for mental wellbeing. This study aims to examine the relationship between mental wellbeing and mobile phone misuse among college students, while also exploring the mediating and moderating roles of the dual system of self-control, comprising the control system and the impulse system. A total of 9961 undergraduate students from a Chinese university participated in this survey, which assessed smartphone addiction, mental wellbeing, and self-control capacities. SPSS 29.0 was employed to analyse the relationships between these variables. Significant associations were identified among mobile phone misuse, the dual systems of self-control, and mental wellbeing. The impulse system was found to mediate the relationship between mental wellbeing and excessive mobile phone use. Furthermore, the control system moderated the interaction between these variables. The findings suggest that enhancing self-control abilities among college students, particularly the effectiveness of their control system, may mitigate the detrimental impact of mobile phone misuse on mental wellbeing.

Keywords: Mental Well-Being Conditions, Smartphone Addiction, Self-Control Dual System, Mediating Role, Moderating Role

Correspondence concerning this article should be addressed to Wei Tian, Phd candidates, School of applied psychology, social work & policy,Universiti Utara Malaysia, Sintok, 06010, Kedah,Malaysia
Email: 18277260051@163.com

Introduction

In the digital age, smart gadgets have become an indispensable part of students of the use of mobile phones has become deeply embedded in college students' academic and daily activities; however, excessive use leading to dependence has increasingly emerged as a matter of concern (Talan et al., 2024). Mobile phone overuse and dependency not only adversely affect students' academic performance and social abilities but may also exacerbate negative emotional states, including anxiety, depression, and social isolation (Vettriselvan et al., 2025).

The dual-system theory of self-control conceptualises human behavioural decision-making as the outcome of two interacting systems: the control system and the impulse system. The impulse system operates rapidly and automatically, predominantly governing immediate gratification and reactions to temptation, whereas the control system functions more slowly and consciously, regulating impulsive urges and supporting long-term goal attainment (Hofmann et al., 2009). In the context of smartphone addiction, the impulse system can drive students to excessively engage with their devices to satisfy immediate entertainment desires, while strengthening the control system may serve as a mechanism to inhibit such impulsive behaviour, thereby limiting mobile phone misuse and mitigating its negative impact on mental wellbeing (Tan et al., 2024).

The primary aim of this research is to examine the associations among smartphone addiction, mental wellbeing, and college students' self-control capacities, with particular attention to the dual-system components—impulse and control systems—as mediators and moderators. Drawing upon theoretical frameworks and prior empirical findings, the following hypotheses are proposed:

H1. There is a substantial association among smartphone addiction, the self-control dual system, and mental wellbeing conditions pairwise.

H2. The impulse system plays mediating role of the association between mobile phone abuse and mental wellbeing conditions.

H3. The control system plays moderating role of the association between mobile phone abuse and mental wellbeing conditions.

Method

Procedure and Participants

To recruit 9961 college students (45.40% female) who had prior experience with mobile phones for this study, a convenience sampling approach was employed. Participants were drawn from a single private university located in Nanning, China. The age of the respondents ranged

from 15 to 29 years, with a mean of 19.77 years (SD = 1.456). Regarding academic standing, 2538 students (25.50%) were first-year undergraduates, 2149 (21.60%) were in their second year, 2665 (26.80%) were third-year students, and 2609 (26.20%) were in their final year. The survey instructions emphasised the importance of providing authentic, independent, and accurate responses. All measures were administered through the university's established psychological assessment system.

Measurements

Smartphone Addiction

Mobile phone misuse was measured using the Simple Version of the Mobile Phone Abuse Scale (SAS-SV). This scale was developed by (Kwon et al., 2013) following an expert review of the original Mobile Phone Abuse Scale (SAS), which identified the 10 items most strongly associated with smartphone addiction. The SAS-SV assesses six dimensions of mobile phone overuse: excessive use, tolerance, positive expectations, withdrawal symptoms, network-related interactions, and disruption of daily life. Responses were rated on a six-point Likert scale from 1 ("strongly disagree") to 6 ("strongly agree"), with scores ≥31 for males and ≥33 for females indicating smartphone addiction, and higher scores reflecting greater severity. In this study, the SAS-SV demonstrated excellent reliability and validity, with a Cronbach's alpha of 0.930 and a KMO of 0.925.

Mental Wellbeing Conditions

Mental wellbeing was assessed using the China College Student Mental Wellbeing Scale (CSMHS). This instrument was developed in 2005 through collaboration between the research team of the Chinese Ministry of Education's "College Student Mental Wellbeing Assessment System" and expert Zheng Richang. The scale comprises 104 items, organised into 12 dimensions: depression, paranoia, inferiority complex, somatization, anxiety, social withdrawal, social aggression, compulsive behaviour, dependence, impulsivity, psychological sexual disorders, and psychiatric tendencies. Higher scores indicate more severe mental health concerns. Participants were required to evaluate the frequency of each symptom over the past month using a five-point scale, ranging from 1 (never) to 5 (always). In the present study, the CSMHS exhibited excellent psychometric performance, with a Cronbach's alpha of 0.958 and a KMO value of 0.972, demonstrating both reliability and validity.

Dual System Self-Control

The dual system of self-control was measured using the DMSC-S developed by (Hofmann et al., 2012). The 21-item scale is divided into two components: the impulse system and the control system. Items 1–12 assess the impulse system, capturing aspects such as impulsivity, distractibility, and immediate gratification, while items 13–21 evaluate the control system, encompassing problem-solving abilities and future-oriented perspective. Each item is rated on a five-point scale, with 1 representing strong disagreement and 5 indicating strong agreement. In this study, the DMSC-S demonstrated a KMO value of 0.940 and a Cronbach's alpha of 0.854, indicating strong overall reliability and validity. The impulse system subscale exhibited even higher psychometric performance, with a Cronbach's alpha of 0.937 and a KMO of 0.946, while the control system subscale achieved a Cronbach's alpha of 0.945 and a KMO of 0.927. Collectively, these findings confirm that the DMSC-S and its constituent subscales possess robust and reliable psychometric properties.

Control Variables

In the present study, control variables such as subject, age, gender, academic year, and place of birth were included in accordance with previous research. All statistical analyses were performed using SPSS 29.0, encompassing assessments of reliability and validity, evaluations of common method bias, descriptive statistics, correlation and regression analyses, as well as examinations of mediation and moderation effects.

Results

Common Method Bias Tests

The questionnaire-based survey in this study posed a potential risk of common method bias (Podsakoff et al., 2003). To address this, unrotated principal component analysis and Harman's single-factor test were applied. The first factor accounted for 18.889% of the variance, below the 40% threshold, and 20 factors had eigenvalues above 1, indicating minimal common method bias.

Descriptive Analysis

In theory, both skewness and kurtosis of a standard normal distribution are equal to 0; however, empirical data rarely conform perfectly to this ideal. In the present study, descriptive statistical analysis was employed to assess the normality of the data. The variables in this study satisfied the criteria for normality, with absolute skewness values below 3 and absolute kurtosis values below 10, as indicated in Table 1.

Therefore, the data can be considered approximately normal and are suitable for subsequent analyses.

Table 1

Description Statistics Among all of Observed Variables

	Number	Minimum Value	Maximum Value	Average	SD	Skewness		Kurtosis	
						Statistics	SE	Statistics	SE
Smartphone Addiction	9961	10	58	27.13	9.008	-0.038	0.025	-0.491	0.049
Mental Wellbeing Conditions		100	294	140.58	30.532	1.517	0.025	2.623	0.049
Impulse System		12	60	22.04	8.411	0.410	0.025	-0.748	0.049
Smartphone Addiction	9961	10	58	27.13	9.008	-0.038	0.025	-0.491	0.049

Note: MPA= Smartphone Addiction, NE= Negative Emotion, SE= Standard Error, SC= Self-Control, SD= Standard Deviation, NCS= Negative Coping Styles.

Pearson Correlation Analysis

To address Objective 1, Pearson correlation analyses were performed on the total scores of the SAS-SV, CSMHS, and the DMSC-S subscales. As indicated in Table 2, mental wellbeing demonstrated a significant positive association with mobile phone misuse ($r = 0.566$, $p < 0.01$). The impulse system exhibited positive correlations with both mental wellbeing ($r = 0.448$, $p < 0.01$) and mobile phone misuse ($r = 0.283$, $p < 0.01$), whereas the control system was significantly inversely related to mental wellbeing ($r = -0.535$, $p < 0.01$) and negatively associated with mobile phone misuse ($r = -0.200$, $p < 0.01$). Additionally, a negative correlation was observed between the impulse and control systems ($r = -0.192$, $p < 0.01$). Collectively, these findings substantiate Hypothesis 1, demonstrating that all variables were significantly interrelated.

Table 2

The Relationships Between all of the Variables that have been Observed

Variables	Smartphone Addiction	Mental Wellbeing Conditions	Impulse System	Control System
Smartphone Addiction	1			
Mental Wellbeing Conditions	0.566**	1		
Impulse System	0.283**	0.448**	1	
Control System	-0.200**	-0.535**	-0.192**	1

Note: * * indicates $p < 0.01$.

Hierarchical Regression Analysis

A hierarchical regression analysis was performed to examine the effect of mobile phone misuse on the mental wellbeing of college students, with mental wellbeing as the dependent variable and mobile phone misuse as the independent variable. The findings revealed that mobile phone misuse remained a significant positive predictor of mental wellbeing ($\beta = 0.566$, $t = 67.877$, $p < 0.001$), explaining 31.4% of the variance in the impulse system ($\Delta R^2 = 0.314$, $F = 4607.352$, $p < 0.001$), even after controlling for demographic factors including subject, age, gender, academic year, and place of origin. These results further corroborate Hypothesis 1.

Mediation Effect Test

To address Objective 2, the mediating role of the impulse system was examined using the SPSS-PROCESS 4.2 plugin, Model 4. In Model 1, with the impulse system as the dependent variable (Table 3), results indicated that mobile phone misuse exerted a significant positive effect on the impulse system ($\beta = 0.221$, $p < 0.001$), demonstrating that higher levels of smartphone addiction were associated with greater impulsivity. In Model 2, where mental wellbeing was the dependent variable, mobile phone misuse showed a substantial positive impact on mental wellbeing problems ($\beta = 0.192$, $p < 0.001$), indicating that more severe smartphone addiction corresponded to poorer mental wellbeing. In Model 3, after incorporating the impulse system as a mediator, the positive effect of mobile phone misuse on mental wellbeing remained significant, though the coefficient decreased ($\beta = 0.162$, $p < 0.001$). Simultaneously, the impulse system continued to exhibit a positive effect on mental wellbeing ($\beta = 0.136$, $p < 0.001$). The R^2 of the model increased from 0.321 to 0.410, suggesting that the impulse system partially mediates the relationship between mobile phone misuse and mental wellbeing.

Table 3

Impulse System Mediating Function

	Y: Impulse System Conditions Model 1		Y: Mental Wellbeing Conditions Model 2		Y: Mental Wellbeing Conditions Model 3	
	β	T	β	t	β	t
X: Mobile Phone Abuse	0.221	29.341***	0.192	67.877***	0.162	58.917***
M:Impulse System					0.136	38.894***
R^2	0.081		0.321		0.410	
F	146.569***		783.882***		990.047***	

Note: * * *indicates $p < 0.001$.

The mediating effect was further evaluated using the bias-corrected non-parametric percentile bootstrap method with 5000 resamples. As shown in Table 4, the indirect effect of the impulse system on mental wellbeing was 0.030, with a 95% confidence interval of [0.001, 0.028], which does not include zero, indicating a significant mediating role of the impulse system in the relationship via mobile phone misuse and mental wellbeing. The direct effect was 0.162 ($p < 0.001$), and the total effect was 0.192, with the mediating effect accounting for 15.63% of the total effect. These findings support Hypothesis 2 and confirm that the impulse system partially mediates the association between mobile phone misuse and mental wellbeing.

Table 4

The Mediation Effect Test Results of Impulse System

Route	Effect Value	Boot SE	Boot LLCI	Boot ULCI
Total Effect（X→Y）	0.192	0.003	0.186	0.197
Direct Effect（X→Y）	0.162	0.003	0.156	0.167
Indirect Effect（X→M→Y）	0.030	0.001	0.028	0.033

Note: BootSE, BootLLCI, and BootULCI respectively refer to the standard error, lower limit, and upper limit of the 95% confidence interval of the indirect effects estimated by the bias corrected percentile bootstrap method.

Moderation Effect Test

To address Objective 3, the moderating role of the control system in the relationship between mobile phone misuse and mental wellbeing was examined using SPSS-PROCESS 4.2, Model 59, while controlling for demographic variables including subject, age, gender, academic year, and place of origin. The results displayed in Table 5. In Model 1, the impulse system was specified as the dependent variable. The results indicated that mobile phone misuse exerted a significant positive effect on mental wellbeing ($\beta = 0.196$, $p < 0.001$), such that higher levels of smartphone addiction corresponded to increased impulsivity scores. Conversely, the impulse system was significantly negatively associated with the control system ($\beta = -0.097$, $p < 0.001$), suggesting that greater self-regulatory capacity was linked to lower impulsivity. Moreover, the interaction between mobile phone misuse and the control system produced a significant negative effect on the impulse system ($\beta = -0.002$, $p < 0.01$), highlighting that the control system moderated the relationship.

The results of Model 2 demonstrated that mobile phone misuse retained a significant positive direct effect on mental wellbeing ($B = 0.131$, $p < 0.001$), with mental wellbeing specified as the dependent variable. The impulse system also exerted a notable positive influence on

mental wellbeing (β = 0.106, p < 0.001), while the control system had a significant negative impact (β = -0.117, p < 0.001). The positive direct effect of mobile phone misuse on mental wellbeing was attenuated by the control system, as reflected by the significant negative effect of the interaction between mobile phone misuse and the control system (β = -0.045, p < 0.001).

Table 5

The Moderating Role of Control Systems

		Y： Impulse System Model 1	Y：Mental Wellbeing Conditions Model 2
Independent Variable	Smartphone Addiction	0.196***	0.131***
Mediation Variable	Impulse System		0.106***
Moderation Variable	Control System	-0.097***	-0.117***
Interaction Term	MPA × IS	-0.002**	-0.045***
	IS × CS		-0.018***
	R^2	0.101	0.592
	F	139.953	1444.635

Note：**indicates p < 0.01, ***indicates p < 0.001.

Furthermore, the interaction between the impulse system and the control system showed a substantial negative effect on mental wellbeing (β = -0.018, p < 0.001), indicating that the capacity of the impulse system to influence mental wellbeing decreased as the strength of the control system increased. Overall, the R^2 values for Model 1 and Model 2 were 0.101 and 0.592, respectively, with both F-tests achieving significance (p < 0.001), suggesting that the models possess strong explanatory power. These findings provide empirical support for Hypothesis 3.

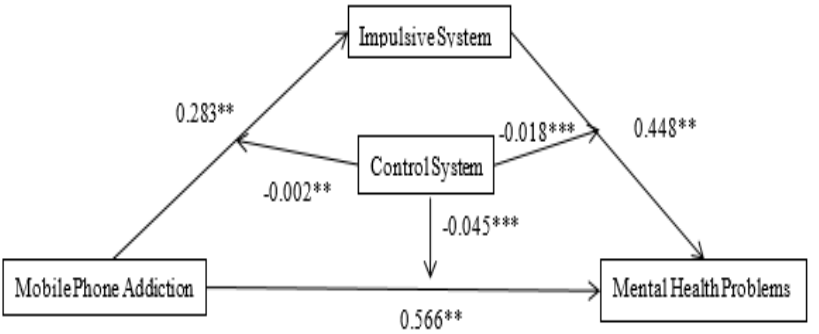

Figure 1: Analysis of the Mediating Role of the Impulsive System and the Moderating Role of the Control System

Discussion and Conclusion

Discussion on Finding 1

This study identified significant correlations between smartphone addiction, the dual system of self-control, and mental wellbeing, consistent with findings from previous research (Shuaishuai, 2025; H. Zhang et al., 2024). First, mental wellbeing was positively associated with mobile phone misuse. College students frequently experience considerable psychological pressures, including academic demands and social comparison, which can exacerbate conditions such as anxiety and depression (Chemagosi, 2024). For example, students often monitor feedback on social media, including shares, comments, and likes, following content publication (Tenenboim, 2022). If the feedback does not meet their expectations, students may experience self-doubt, perceive their lives as uninteresting, and feel socially unrecognised. These experiences can heighten negative emotions, such as low mood and restlessness (Niraula & Bohora, 2023).

Furthermore, excessive mobile phone use can lead to sleep deprivation, disrupting neurotransmitter balance (A. Zhang et al., 2022), which may impair emotional regulation due to reduced serotonin and dopamine levels, ultimately affecting mental wellbeing (Bastos et al., 2023). Overreliance on mobile phones may also diminish face-to-face social interactions, reducing social skills and increasing social anxiety, thereby aggravating mental health issues such as loneliness and anxiety (Lyngdoh et al., 2023). Additionally, the impulse system can influence students' emotional regulation; when students recognise the consequences of their mobile phone misuse, they may adopt maladaptive coping strategies that further exacerbate mental health problems (Naeim et al., 2021; Zhang et al., 2025).

Second, a strong positive correlation was observed between the impulse system and mobile phone misuse. College students often make impulsive decisions in response to the immediate gratification provided by smartphones, making it difficult to regulate usage frequency and duration, leading to patterns of overuse (Gui et al., 2023). Many mobile applications are designed with rapid feedback mechanisms, which reinforce impulsive behaviour by generating instant satisfaction (Robayo-Pinzon et al., 2021). Activities such as gaming, social media engagement, and short video consumption can quickly elicit feelings of accomplishment and enjoyment, activating the brain's reward system and releasing dopamine, thereby reinforcing impulsive tendencies (Putri et al., 2023; Raji et al., 2025).

Mobile phones also serve as a means of escaping real-life stress and negative emotions, including sadness, anxiety, and loneliness, a behaviour driven by the impulse system (Li et al., 2021). Although these avoidance behaviours may offer temporary relief, they can increase long-term addictive tendencies. The control system interacts with the impulse system, and in situations of weakened control or cognitive fatigue, impulsive responses may dominate, resulting in maladaptive behaviours (Grassi et al., 2022).

Finally, the control system demonstrated a strong association with mental wellbeing. When developed and practiced, the control system can regulate impulsivity and mitigate mobile phone overuse (A. Zhang et al., 2022). Enhanced control system skills enable students to manage emotions effectively, preventing the emergence of addictive behaviours linked to anxiety and depression (J. Zhang et al., 2022). For instance, individuals may cope with stress through meditation or physical exercise rather than resorting to mobile phone use (Niu, 2023). Those with well-developed control system capacities tend to pursue long-term benefits over short-term pleasures, which helps prevent deterioration of mental wellbeing. Moreover, strong control system skills facilitate better stress management and adaptive coping strategies, reducing the likelihood of avoidance behaviours (Li et al., 2024). Strengthening the control system and overall self-control capabilities should therefore be prioritised as a means to prevent mobile phone overuse and mitigate its detrimental effects on mental wellbeing.

Discussion on Finding 2

The present study established that the relationship between mobile phone misuse and mental wellbeing is mediated by the impulse system, consistent with recent research (Wu et al., 2023; Wu et al., 2024). Firstly, college students are susceptible to impulsive decisions due to the temptations presented by mobile phones, which activate the impulse system and encourage prolonged usage during periods of distraction. This often results in difficulty regulating the frequency and duration of phone use, ultimately contributing to patterns of smartphone addiction (J. Zhang et al., 2022). The convenience and accessibility of mobile phones in daily life act as a persistent lure (Chindia & Wawire, 2024).

When confronted with such temptations, students tend to act immediately rather than consider the long-term consequences, reinforcing the cycle of extended use (Robayo-Pinzon et al., 2021). Empirical evidence indicates that impulsivity is a key predictor of mobile phone overuse, with highly impulsive individuals more likely to develop habitual misuse (Guo et al., 2022). This tendency toward impulsivity is

not confined to smartphone use and may generalise to other domains of behaviour, leading to broader patterns of impulsive actions. For instance, highly impulsive students may be more easily distracted during work, study, or other critical tasks, which can negatively affect overall mental wellbeing and quality of life (Elzohairy et al., 2024).

Secondly, the impulse system influences the emotional regulation of college students. When students are criticised or confronted with the consequences of their mobile phone addiction, they may adopt maladaptive strategies to manage negative emotions (Pan et al., 2025). For example, reprimands from teachers or parents regarding excessive device use can evoke feelings of humiliation, anger, or anxiety. In such cases, the impulse system may drive avoidance or resistance behaviours rather than reflective problem-solving, which can further exacerbate emotional distress (Martínez-Líbano & Yeomans-Cabrera, 2024). Research has also highlighted that the relationship between social isolation and mobile phone overuse is mediated by loneliness and anxiety, a process intensified by impulsive behaviour during the pandemic. Impulsivity encouraged students to rely on mobile devices for information and social connection, which, while temporarily alleviating feelings of isolation, ultimately reinforced the cycle of loneliness and anxiety (Liu et al., 2021).

Moreover, college students often seek immediate gratification provided by mobile phones, fostering psychological attachment in line with the impulse system. Activities such as social media engagement, gaming, and short video consumption offer instant pleasure and a sense of accomplishment, which further reinforce addictive behaviour (Xuehui et al., 2025). Studies have shown that automatic thought patterns and peer attachment mediate the relationship between family cohesion and mobile phone misuse, with impulsive behaviour playing a critical role in the development of psychological dependence. For instance, when students experience unmet needs or lack focus within their family environment, they may turn to mobile phones to fulfil these psychological needs (Zhang et al., 2023). In situations of loneliness or boredom, students may immerse themselves in virtual interactions to gain attention and form social connections, which not only exacerbates addiction but can also foster real-world social alienation, thereby impacting mental wellbeing. Additionally, the impulse system promotes automatic thought processes, such as perceiving incoming messages as urgent, which further entrenches habitual phone use and reinforces reliance on mobile devices (Flayelle et al., 2023).

Discussion on Finding 3

The present study indicated that the control system moderates the association between mobile phone misuse and mental wellbeing, consistent with prior research (Peng et al., 2022; Shen et al., 2023). Mobile phone use among college students is largely influenced by self-control capacity, with those exhibiting higher self-regulation more effectively managing their time, thus maintaining appropriate usage frequency and duration (Yu, 2022). Strong self-control is also closely linked to mental wellbeing, as individuals with well-developed regulatory skills can better manage thoughts and behaviours, reducing mental health problems related to impulsivity, including excessive smartphone use (He et al., 2023; Tornquist & Miles, 2023).

Students with elevated self-control can regulate arousal and counteract self-regulation fatigue from academic stress, thereby limiting fatigue-driven mobile phone overuse (M. Zhang et al., 2024). Enhancing self-control has also been shown to alleviate depressive symptoms (He et al., 2023), with cognitive control improvements reducing depressive tendencies and moderating the impact of mobile phone misuse on mental health (Dell'Acqua et al., 2022). Behavioural regulation further mitigates smartphone addiction. Students with strong self-control tend to prioritise long-term benefits over immediate gratification, reducing reliance on mobile phones (Reach, 2023). Engagement in physical activity directly decreases screen time and indirectly strengthens self-control, further limiting overuse (Ahn & Kim, 2022). Consequently, differences in behavioural strategies diminish the risk of mobile phone addiction, with individuals possessing greater self-control less dependent on smartphones for pleasure (J. Zhang et al., 2022).

Research Contribution

Theoretical Contribution

Firstly, this study contributes to the enrichment of the dual system theory of self-control. Grounded primarily in the dual system framework, the research examined the interrelationships among smartphone addiction, the dual system of self-control, and mental wellbeing, offering a novel perspective on the decision-making processes of college students when confronted with digital temptations. This approach extends the theoretical boundaries of the dual system of self-control by applying it to contemporary challenges in digital behaviour. Secondly, the study advances understanding of the psychological mechanisms underlying smartphone addiction. By elucidating the mediating role of the impulse

system between mobile phone misuse and mental wellbeing, the research demonstrates how impulsivity amplifies the adverse effects of excessive smartphone use through psychological dependence and impaired emotional regulation. These findings provide a more nuanced comprehension of the cognitive and emotional processes that contribute to smartphone addiction, establishing a theoretical foundation for future investigations and facilitating exploration of the antecedents and developmental trajectories of addictive digital behaviour.

Finally, the study highlights the critical role of the control system. The results indicate that the control system moderates the relationship between mobile phone misuse and mental wellbeing, underscoring the importance of self-regulatory capacity in mitigating the detrimental consequences of smartphone addiction. This insight offers both theoretical and practical implications, providing a framework for understanding how self-control enables individuals to manage digital temptations and maintain mental wellbeing, as well as informing the development of targeted intervention strategies aimed at reducing smartphone-related harm.

Practical Contribution

Firstly, the study offers guidance for mental wellbeing education. By highlighting the significance of self-control capacities, universities can develop targeted educational programmes and initiatives aimed at enhancing students' self-regulatory skills and reducing vulnerability to smartphone addiction. For instance, interventions such as time management workshops and emotion regulation training can equip students with strategies to effectively manage behaviour and emotional responses, thereby alleviating potential mental health challenges. Secondly, the findings provide a foundation for evidence-based intervention strategies. Enhancing the functionality of the control system through approaches such as behavioural modification programmes and cognitive-behavioural therapy can help students regulate smartphone use and mitigate associated mental health risks.

Concurrently, interventions targeting the impulse system, for example, reducing the immediate feedback mechanisms embedded in mobile applications, may serve as an effective preventative measure against the development of addictive behaviours. Finally, the study emphasises the promotion of holistic student development. Strengthening self-control capacities not only mitigates the adverse impact of mobile phone misuse on mental wellbeing but also fosters broader growth across academic, social, and psychological domains,

supporting a more comprehensive development of students' overall wellbeing.

Future Prospects and Research Limitations

Despite its contributions, this study has limitations. The cross-sectional design limits causal inference: longitudinal approaches could better capture how mobile phone misuse, mental wellbeing, and self-control interact. The sample, drawn from one university, restricts generalisability, so including varied institutions and regions would add strength. Moreover, while the study examined impulse and control systems, other factors such as family environment and social support may also shape self-control. Future research should consider these to provide a fuller picture of mobile phone misuse and mental wellbeing.

References

Ahn, J., & Kim, I. (2022). The effect of autonomy and self-control on changes in healthy lifestyles of inactive college students through regular exercise. *International journal of environmental research and public health*, *19*(17), 10727. https://doi.org/10.3390/ijerph191710727

Bastos, L. M. V., Viana, L. M. C., Peixoto, M. C. B. G., Pimentel, I. D. S., de Figueirêdo, L. R. B., de Oliveira Jereissati, L., Lima, L. M. F. V., Aguiar, A. B., & dos Santos, J. C. C. (2023). Sleep loss causes emotional dysregulations increasing depression and anxiety: a reciprocal relationship. *Brazilian Journal of Health Review*, *6*(4), 16367-16382. https://doi.org/10.34119/bjhrv6n4-185

Chemagosi, M. J. (2024). Student well-being in higher education institutions: academic pressures. In *Student well-being in higher education institutions* (pp. 81-106). IGI Global. https://doi.org/10.4018/979-8-3693-4417-0.ch004

Chindia, B., & Wawire, S. N. (2024). Student attitudes towards smartphone use in a pre-service teacher tech course. *Advances in Mobile Learning Educational Research*, *4*(1), 994-1006. https://doi.org/10.25082/AMLER.2024.01.011

Dell'Acqua, C., Messerotti Benvenuti, S., Vallesi, A., Palomba, D., & Ambrosini, E. (2022). Depressive symptoms and cognitive control: the role of affective interference. *Cognition and Emotion*, *36*(7), 1389-1403. https://doi.org/10.1080/02699931.2022.2128065

Elzohairy, N. W., Elzlbany, G. A. M., Khamis, B. I., El-Monshed, A. H., & Atta, M. H. R. (2024). Mindfulness-based training effect on attention, impulsivity, and emotional regulation among children with ADHD: The role of family engagement in randomized controlled trials. *Archives of psychiatric nursing*, *53*, 204-214. https://doi.org/10.1016/j.apnu.2024.10.001

Flayelle, M., Brevers, D., King, D. L., Maurage, P., Perales, J. C., & Billieux, J. (2023). A taxonomy of technology design features that promote potentially addictive online behaviours. *Nature Reviews Psychology*, *2*(3), 136-150. https://doi.org/10.1038/s44159-023-00153-4

Grassi, G., Cecchelli, C., & Vignozzi, L. (2022). Impulsivity, decision-making, and reward system as key factors in addiction. In *Handbook of Substance Misuse and Addictions: From Biology to Public Health* (pp. 537-555). Springer. https://doi.org/10.1007/978-3-030-92392-1

Gui, D.-Y., Dai, Y., Zheng, Z., & Liu, S. (2023). Losing control without your smartphone: Anxiety affects the dynamic choice process of impulsive decision-making and purchase. *Frontiers in Neuroscience*, *17*, 998017. https://doi.org/10.3389/fnins.2023.998017

Guo, Z., Liang, S., Ren, L., Yang, T., Qiu, R., He, Y., & Zhu, X. (2022). Applying network analysis

to understand the relationships between impulsivity and social media addiction and between impulsivity and problematic smartphone use. *Frontiers in Psychiatry*, *13*, 993328. https://doi.org/10.3389/fpsyt.2022.993328

He, M., Zhan, X., Liu, C., Li, L., Zhao, X., Ren, L., Li, K., & Luo, X. (2023). The relationship between self-control and mental health problems among Chinese university students. *Frontiers in Public Health*, *11*, 1224427. https://doi.org/10.3389/fpubh.2023.1224427

Hofmann, W., Friese, M., & Strack, F. (2009). Impulse and self-control from a dual-systems perspective. *Perspectives on psychological science*, *4*(2), 162-176. https://doi.org/10.1111/j.1745-6924.2009.01116.x

Hofmann, W., Schmeichel, B. J., & Baddeley, A. D. (2012). Executive functions and self-regulation. *Trends in cognitive sciences*, *16*(3), 174-180. https://doi.org/10.1016/j.tics.2012.01.006

Kwon, M., Lee, J.-Y., Won, W.-Y., Park, J.-W., Min, J.-A., Hahn, C., Gu, X., Choi, J.-H., & Kim, D.-J. (2013). Development and Validation of a Smartphone Addiction Scale (SAS). *PLoS ONE*, *8*(2). https://doi.org/10.1371/journal.pone.0056936

Li, J., Zhan, D., Zhou, Y., & Gao, X. (2021). Loneliness and problematic mobile phone use among adolescents during the COVID-19 pandemic: The roles of escape motivation and self-control. *Addictive behaviors*, *118*, 106857. https://doi.org/10.1016/j.addbeh.2021.106857

Li, X., Wang, M., Feng, X., He, L., & Du, J. (2024). The influence of stress perception on mobile phone addiction tendency in nursing undergraduates: the mediating role of self-control and the moderating role of psychological capital. *BMC nursing*, *24*(1), 1116. https://doi.org/10.1186/s12912-025-03753-y

Liu, Q.-Q., Yang, X.-J., Zhu, X.-W., & Zhang, D.-J. (2021). Attachment anxiety, loneliness, rumination and mobile phone dependence: A cross-sectional analysis of a moderated mediation model. *Current Psychology*, *40*(10), 5134-5144. https://doi.org/10.1007/s12144-019-00464-x

Lyngdoh, T., El-Manstrly, D., & Jeesha, K. (2023). Social isolation and social anxiety as drivers of generation Z's willingness to share personal information on social media. *Psychology & Marketing*, *40*(1), 5-26. https://doi.org/10.1002/mar.21744

Martínez-Líbano, J., & Yeomans-Cabrera, M.-M. (2024). Depression, anxiety, and stress in the Chilean Educational System: children and adolescents post-pandemic prevalence and variables. Frontiers in Education, https://doi.org/10.3389/feduc.2024.1407021

Naeim, M., Rezaeisharif, A., & Kamran, A. (2021). The role of impulsivity and cognitive emotion regulation in the tendency toward addiction in male students. *Addictive Disorders & Their Treatment*, *20*(4), 278-287. https://doi.org/10.1097/ADT.0000000000000243

Niraula, K. B., & Bohora, P. (2023). College Students' Utilization of Social Networking Sites. *International Journal of Technology in Education and Science*, *7*(3), 274-289. https://doi.org/10.46328/ijtes.472

Niu, S. (2023). Mobile phone addiction, self-control, physical exercise, and depression: a moderated mediation model. *Journal of Psychology in Africa*, *33*(3), 235-240. https://doi.org/10.1080/14330237.2023.2195709

Pan, J., Guo, J., Wu, Y., & Zhao, X. (2025). The influence of negative emotions on mobile phone addiction among Chinese college students: the mediating role of negative coping styles and the moderating role of gender. *Psychology Research and Behavior Management*, 3-13. https://doi.org/10.2147/PRBM.S497255

Peng, Y., Zhou, H., Zhang, B., Mao, H., Hu, R., & Jiang, H. (2022). Perceived stress and mobile phone addiction among college students during the 2019 coronavirus disease: The mediating roles of rumination and the moderating role of self-control. *Personality and individual differences*, *185*, 111222. https://doi.org/10.1016/j.paid.2021.111222

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology*, *88*(5), 879. https://doi.org/10.1037/0021-9010.88.5.879

Putri, N. A., Kamaluddin, K., & Amrina, A. (2023). TikTok Application on Achievement and Learning Motivation at Influence Colleges. *Scientechno: Journal of Science and*

Technology, *2*(1), 80-96. https://doi.org/10.55849/scientechno.v2i1.62

Raji, H., Dinesh, S., & Sharma, S. (2025). Inside the impulsive brain: a narrative review on the role of neurobiological, hormonal and genetic factors influencing impulsivity in psychiatric disorders. *The Egyptian Journal of Neurology, Psychiatry and Neurosurgery*, *61*(1), 4. https://doi.org/10.1186/s41983-024-00930-9

Reach, G. (2023). How is patient adherence possible? A novel mechanistic model of adherence based on humanities. *Patient preference and adherence*, 1705-1720. https://doi.org/10.2147/PPA.S419277

Robayo-Pinzon, O., Foxall, G. R., Montoya-Restrepo, L. A., & Rojas-Berrio, S. (2021). Does excessive use of smartphones and apps make us more impulsive? An approach from behavioural economics. *Heliyon*, *7*(2). https://doi.org/10.1016/j.heliyon.2021.e06104

Shen, X., Wang, C., Chen, C., Wang, Y., Wang, Z., Zheng, Y., & Liu, H. (2023). Stress and internet addiction: Mediated by anxiety and moderated by self-control. *Psychology Research and Behavior Management*, 1975-1986. https://doi.org/10.2147/PRBM.S411412

Shuaishuai, Z. (2025). The effects of physical activity on adolescent psychological sub-health: chain-mediated effects of self-control and mobile phone addiction. *BMC psychology*, *13*(1), 98. https://doi.org/10.1186/s40359-025-02434-4

Talan, T., Doğan, Y., & Kalinkara, Y. (2024). Effects of smartphone addiction, social media addiction and fear of missing out on university students' phubbing: A structural equation model. *Deviant Behavior*, *45*(1), 1-14. https://doi.org/10.1080/01639625.2023.2235870

Tan, K.-A., Nik Jaafar, N. R., Bahar, N., Ibrahim, N., Baharudin, A., Wan Ismail, W. S., Abdul Aziz, M., & Sim, S. T. (2024). The dual systems model—impulsivity and narcissism as the reflexive System and self-regulation as the reflective system—of smartphone addiction. *Cyberpsychology, Behavior, and Social Networking*, *27*(2), 156-162. https://doi.org/10.1089/cyber.2023.0337

Tenenboim, O. (2022). Comments, shares, or likes: What makes news posts engaging in different ways. *Social Media+ Society*, *8*(4), 20563051221130282. https://doi.org/10.1177/20563051221130282

Tornquist, M., & Miles, E. (2023). Trait self-control and beliefs about the utility of emotions and emotion regulation in self-control performance. *Self and Identity*, *22*(4), 639-668. https://doi.org/10.1080/15298868.2022.2146183

Vettriselvan, R., Velmurugan, P. R., Varshney, K. R., EP, J., & Deepika, R. (2025). Health Impacts of Smartphone and Internet Addictions Across Age Groups: Physical and Mental Health Across Generations. In *Impacts of Digital Technologies Across Generations* (pp. 187-210). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-6366-9.ch010

Wu, J., Yang, Z., Wu, M., & Huang, H. (2023). The relationship between college students' mobile phone addiction and aggression: A moderated mediation model. *Applied Research in Quality of Life*, *18*(2), 1037-1055. https://doi.org/10.1007/s11482-022-10126-z

Wu, W., Li, S., Chen, F., & Zeng, Y. (2024). Longitudinal relationship between mobile phone addiction and adolescents' perceived stress: mediating role of self-control and moderating role of physical exercise. *Current Psychology*, *43*(44), 33920-33932. https://doi.org/10.1007/s12144-024-06916-3

Xuehui, H., Zainol, Z., & Ailing, S. (2025). Opportunities and Challenges of Short Video Usage for the Elderly in China. *ANP Journal of Social Science and Humanities*, *6*(1), 77-84. https://shopee.co.th/flash_sale?fromItem=28438424232&promotionId=15940070296 7808

Yu, W. (2022). Phone Boost Self-Control or Control You. 2022 5th International Conference on Humanities Education and Social Sciences (ICHESS 2022), https://doi.org/10.2991/978-2-494069-89-3_269

Zhang, A., Xiong, S., Peng, Y., Zeng, Y., Zeng, C., Yang, Y., & Zhang, B. (2022). Perceived stress and mobile phone addiction among college students: The roles of self-control and security. *Frontiers in Psychiatry*, *13*, 1005062. https://doi.org/10.3389/fpsyt.2022.1005062

Zhang, H., Chen, C., Zhang, L., Xue, S., & Tang, W. (2024). The association between the deviation from balanced time perspective on adolescent pandemic mobile phone addiction: the moderating role of self-control and the mediating role of psychological distress. *Frontiers in Psychology*, *14*, 1298256. https://doi.org/10.3389/fpsyg.2023.1298256

Zhang, J., Zhang, X., Zhang, K., Lu, X., Yuan, G., Yang, H., Guo, H., Zhu, Z., Wang, T., & Hao, J. (2022). An updated of meta-analysis on the relationship between mobile phone addiction and sleep disorder. *Journal of affective disorders*, *305*, 94-101. https://doi.org/10.1016/j.jad.2022.02.008

Zhang, M., Pan, J., Shi, W., Qin, Y., & Guo, B. (2024). The more self-control, the more anxious?—A network analysis study of the relationship between self-control and psychological anxiety among Chinese university students. *BMC psychology*, *12*(1), 648. https://doi.org/10.1186/s40359-024-02099-5

Zhang, R., Zhang, C., & Huang, L. (2025). Emotional regulation self-efficacy and impulsivity effects on college students' risk-taking behavior: a cross-sectional study. *Frontiers in Psychology*, *16*, 1566618. https://doi.org/10.3389/fpsyg.2025.1566618

Zhang, Y., Li, Y., Xia, M., Han, M., Yan, L., & Lian, S. (2023). The relationship between loneliness and mobile phone addiction among Chinese college students: The mediating role of anthropomorphism and moderating role of family support. *PLoS ONE*, *18*(4), e0285189. https://doi.org/10.1371/journal.pone.0285189