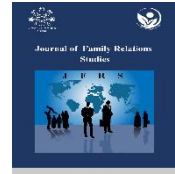




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Research Paper

Causal modeling of the role of parental neglect in the tendency towards adolescents' mobile phone addiction with the mediation of personal growth initiative



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ABSTRACT

Objective: Mobile phone addiction in adolescents is considered one of the fundamental challenges to development and mental health. This study aimed to model the causal role of parental neglect in adolescents' tendency to become addicted to mobile phones through the mediation of personal growth initiative.

Methods: The present study is a descriptive correlational study. The statistical population included all male students in the second year of high school in public schools in Karaj in the academic year 2025, of which 300 were selected by cluster random sampling and responded to the scales of mobile phone addiction, personal growth initiative, and parental neglect. The obtained data were analyzed using Pearson correlation coefficient tests and structural equation modeling using SPSS 25 and Lisrel 8.8 software.

Results: Findings indicated that parental neglect was positively related to mobile phone addiction ($\beta = 0.42$), while it was negatively associated with personal growth initiative ($\beta = -0.58$). Personal growth initiative also negatively predicted mobile phone addiction ($\beta = -0.59$) and significantly mediated the relationship between parental neglect and mobile phone addiction ($\beta = 0.34$). The model fit the data well.

Conclusion: These findings indicate that promoting personal growth initiative can play a protective role against adolescents' tendency to mobile phone addiction and, at the same time, highlight the importance of parents' attention to their children's needs in preventing this addiction.

1. Introduction

Adolescents are highly vulnerable to addictive behaviors due to brain developmental changes, and most substance abuse cases begin in this period, making it a major public health concern (Mohammadiyan et al., 2025; Caves et al., 2025). Among these, adolescents' excessive dependence on mobile phones has raised widespread concerns in society (Ji et al., 2025). The multifunctional capabilities of smartphones, along with their personalized nature, easy accessibility, and convenience, have intensified social dependence on these devices (Li

& Liu, 2025). Research has shown that mobile phone addiction is associated with multiple consequences, including sleep disorders (Tettamanti et al., 2020), decreased well-being (Horwood & Anglim, 2019), interpersonal conflicts (Elhai et al., 2019), and even serious psychological problems such as risky behaviors (Vannucci et al., 2020). Therefore, identifying the underlying factors of mobile phone addiction in adolescents and designing intervention strategies holds considerable practical and research significance.

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Mobile phone addiction is influenced by a range of individual, physiological, psychological, and environmental factors. At the individual level, gender and age have been identified as important predictors of mobile phone addiction (Farchakh et al., 2021). Adolescents and students may be particularly vulnerable to problematic mobile phone use, with approximately 20% reporting symptoms of mobile phone addiction (Lin et al., 2021). Individual characteristics such as low self-esteem, loneliness, and anxiety have also been associated with mobile phone addiction and may contribute to excessive use and dependence (Kara et al., 2021). Gender differences in patterns of mobile phone use have further been reported, with boys tending to use mobile phones more frequently for online gaming, whereas girls tend to use them more often for social interactions (Krishnamurthy et al., 2025). Recent findings indicate that smartphone use among adolescents is highly prevalent, with 89.8% reporting smartphone use; among these users, 64% experience symptoms of mobile phone addiction (Ladani et al., 2025).

In addition, the role of the family environment is significant, as parental supervision meaningfully reduces adolescents' mobile phone addiction over time (Long & Qin, 2025). Adolescent development is influenced by a set of factors including family, peer groups, and friends; however, the family remains the closest and most direct environmental system affecting adolescents' psychological, emotional, and behavioral development (Bronfenbrenner & Morris, 2007). Various studies have shown that family-related factors play a major role in the emergence of adolescents' addictive behaviors, and among them, parental neglect has been identified as one of the key predictors of such behaviors (Namvaran et al., 2025; Nazligül et al., 2023). Parental neglect refers to the failure of parents to fulfill responsibilities and provide necessary supportive behaviors toward their children, such as not meeting essential physical needs (e.g., food, shelter, and medical care), emotional and educational needs, or failing to provide adequate supervision of children's activities (Cha & Yang, 2020). In such neglectful and unsupportive environments, adolescents are usually deprived of necessary monitoring and emotional support, which increases their vulnerability to addictive behaviors, especially in the online domain (Li et al., 2024). Research evidence also indicates that parental neglect is positively and significantly associated with adolescents' addiction to social media (Bae, 2024). In contrast, parental rejection is negatively related to adolescents' personal growth initiative (Batoool & Khurshid, 2024).

Ultimately, one of the variables that may play a mediating role in the relationship between parental neglect and adolescents' mobile phone addiction is

personal growth initiative. Personal growth initiative refers to an individual's active and intentional engagement in the process of personal development, which may involve cognitive, behavioral, and emotional changes across different domains of life (Robitschek, 2003). It encompasses four key dimensions that facilitate intentional personal development: readiness for change, planfulness, using resources, and intentional behavior (Robitschek et al., 2022). Previous studies have shown that personal growth initiative plays an important role in mitigating the negative effects of psychological problems, including reducing depression, and facilitates the search for adaptive coping strategies, thereby enhancing individuals' ability to cope with diverse situations (Li et al., 2024; Yue et al., 2024; Weigold et al., 2024). From this perspective, personal growth initiative can act as a protective factor against addictive behaviors, particularly social media addiction. In addition, recent studies have shown that personal growth initiative contributes to the fulfillment of individuals' cognitive and emotional needs, thereby increasing their psychological well-being (Gong et al., 2024). Higher levels of personal growth initiative and optimism may also reduce the risk of social media addiction among students (Yue et al., 2025). Along these lines, recent research suggests that personal growth initiative, together with basic psychological needs, mediates the relationship between parental neglect and adolescents' social media addiction (Jia-Yuan et al., 2025).

Given the increasing importance of mobile phones in adolescents' lives and the negative consequences of their excessive use, identifying risk and protective factors related to the tendency toward mobile phone addiction is essential. On the other hand, the family environment, and particularly parental neglect, has been repeatedly emphasized as one of the fundamental determinants in the formation of adolescents' behaviors. In this regard, while parental neglect may predispose adolescents to risky behaviors, psychological variables such as personal growth initiative may act as mediating factors in this relationship. Accordingly, the present study aimed to model the causal role of parental neglect in adolescents' mobile phone addiction with the mediating role of personal growth initiative, based on the conceptual model illustrated in Figure 1, to provide a deeper understanding of the underlying mechanisms of this phenomenon and to design more effective preventive and intervention strategies. Based on this, the research hypotheses are as follows:

- Parental neglect has a significant positive relationship with mobile phone addiction.
- Parental neglect has a significant negative relationship with personal growth initiative.

- Personal growth initiative has a significant negative relationship with mobile phone addiction.
- Personal growth initiative mediates the relationship between parental neglect and mobile phone addiction.

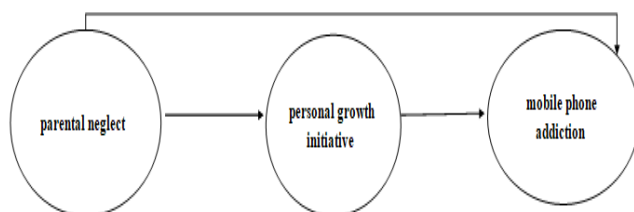


Figure 1. Conceptual research model

2. Materials and Methods

The present study was applied in terms of purpose and descriptive in terms of nature and method. The statistical population consisted of all male high school students (second level) in public schools of Karaj city during the 2024–2025 academic year. Considering that in structural equation modeling, a sample size between 150 and 200 is recommended for stable parameter estimation (Hair et al., 2014), in this study, in order to increase the validity and generalizability of the results, 300 students were selected using a multi-stage cluster random sampling method.

Inclusion criteria included being between 15 and 18 years old, enrollment in public high schools in Karaj city during the 2024–2025 academic year, informed consent from the student and parents or guardians, absence of severe psychiatric disorders (based on school records or confirmation by the school counselor), and the ability to read and independently respond to the questionnaires. Exclusion criteria included lack of cooperation in completing the questionnaires or providing unrealistic responses, absence on the day of data collection or withdrawal from participation, observation or report of severe psychological or behavioral symptoms that made further participation inappropriate, and receiving concurrent official therapeutic or counseling services outside the school that could affect the study variables.

For data collection, the researcher referred to the Karaj Department of Education, completed the required administrative procedures, and, after obtaining official permission, coordinated with the schools to conduct the study. From the four educational districts of Karaj, one district was randomly selected. In the next step, a list of public high schools (second level) in the selected district was prepared, and two schools were chosen through cluster random sampling. After coordination with the principals, counselors, and teachers of the selected schools, the researcher attended the schools, explained the purpose of the study to the students, and, after

obtaining informed consent from them and their parents, distributed the questionnaires. The questionnaires were completed in the school environment, in groups, and in the presence of the researcher, and were collected in the same session.

Instrument:

Mobile Phone Addiction Questionnaire: The Mobile Phone Dependency Questionnaire was developed by Koo (2009). The first part includes demographic information (age, father's occupation, and economic status) and the pattern of mobile phone use. The second part consists of 20 items measuring mobile phone dependency, classified and scored in three domains: deprivation tolerance (7 items), life dysfunction (6 items), and compulsion–insistence (7 items). Each item is rated on a four-point scale ranging from very high (4), high (3), low (2), to very low (1), and the scores classify participants into mobile phone addicts, heavy users, and moderate users. A score of ≥ 70 indicates addiction, scores between 63–70 indicate heavy use, and scores below 63 indicate moderate use. To assess reliability, Cronbach's alpha was calculated as 0.92. The validity of the questionnaire was determined using factor analysis, and after translation, it was confirmed by relevant experts (Koo, 2009). In the present study, the reliability coefficients were 0.81 for deprivation tolerance, 0.80 for life dysfunction, 0.82 for compulsion–insistence, and 0.90 for the total mobile phone addiction score.

Personal Growth Initiative Questionnaire: The Personal Growth Initiative Questionnaire was developed by Robitschek (1998). This instrument consisted of 16 items, all rated on a six-point Likert scale ranging from 0 (*strongly disagree*) to 5 (*strongly agree*). A higher total score indicated a higher level of personal growth initiative (Robitschek, 1998). In Yue's study, the Cronbach's alpha coefficient for this scale was reported as 0.90 (Yue et al., 2025). In the present study, the reliability coefficient for the total score of personal growth initiative was obtained as 0.91.

Parental Neglect Questionnaire: The Parental Neglect Questionnaire in this study was used to measure parental neglect based on the Parental Neglect Scale by Straus (2006). It includes 8 items, which are rated on a 5-point scale ranging from "Strongly agree" (score 5), "Agree" (score 4), "Neutral" (score 3), "Disagree" (score 2), to "Strongly disagree" (score 1). The total score ranges from 1 to 40 (Straus, 2006). One sample item is: "When I was upset and emotional, my parents did not comfort me." The reliability coefficient for parental neglect was reported as 0.69 (Chidambaram et al., 2023). In the present study, the reliability coefficient for the total score of Personal Growth Initiative was 0.90.

3. Results

A total of 300 male students participated in the study. The participants had a mean age of 16.16 years (SD = 1.26). Regarding field of study, 132 participants (44.00%) were enrolled in the humanities, 121

(40.33%) in experimental sciences, and 47 (15.67%) in mathematics. In terms of economic status, 155 participants (51.67%) reported an average economic status, 76 (25.33%) reported a good economic status, and 69 (23.00%) reported a poor economic status.

Table 1. Means, Standard Deviations, and Correlation Coefficients of the Participants' Scores on the Research Variables

Variables	1	2	3	4	5	6
Parental neglect	1					
personal growth initiative	-0.51**	1				
Tolerating deprivation	0.31**	-0.29**	1			
Life function disorder	0.38**	-0.30**	0.78**	1		
Coercion-Insistence	0.35**	-0.33**	0.73**	0.69**	1	
mobile phone addiction	0.59**	-0.54**	0.45**	0.11*	0.25*	1
mean	25.19	46.65	14.24	18.18	13.10	45.52
Standard deviation	2.54	4.14	3.25	2.84	4.95	3.82

Table 2 presents the means, standard deviations, and correlation coefficients among the study variables. The results also showed that mobile phone addiction was positively and significantly correlated with the total score of parental neglect ($r = 0.59$, $p < 0.001$) and negatively and significantly correlated with the total score of personal growth initiative ($r = -0.54$, $p < 0.001$). Additionally, personal growth initiative was negatively and significantly correlated with the total score of parental neglect ($r = -0.51$, $p < 0.001$).

The significance level in the present study was set at 0.05. Before data analysis and to ensure that the study data met the underlying assumptions of structural

equation modeling, several key assumptions were examined, including missing data, normality, and multicollinearity. The Kolmogorov-Smirnov test was used to assess the distributional normality of the study variables. The results indicated no statistically significant deviations from normality ($p > 0.05$). Multicollinearity among variables was assessed using the tolerance statistic and variance inflation factor (VIF). The results showed that tolerance values for all variables were above 0.10, indicating no multicollinearity, and the VIF values were less than 10, further confirming the absence of multicollinearity among the variables.

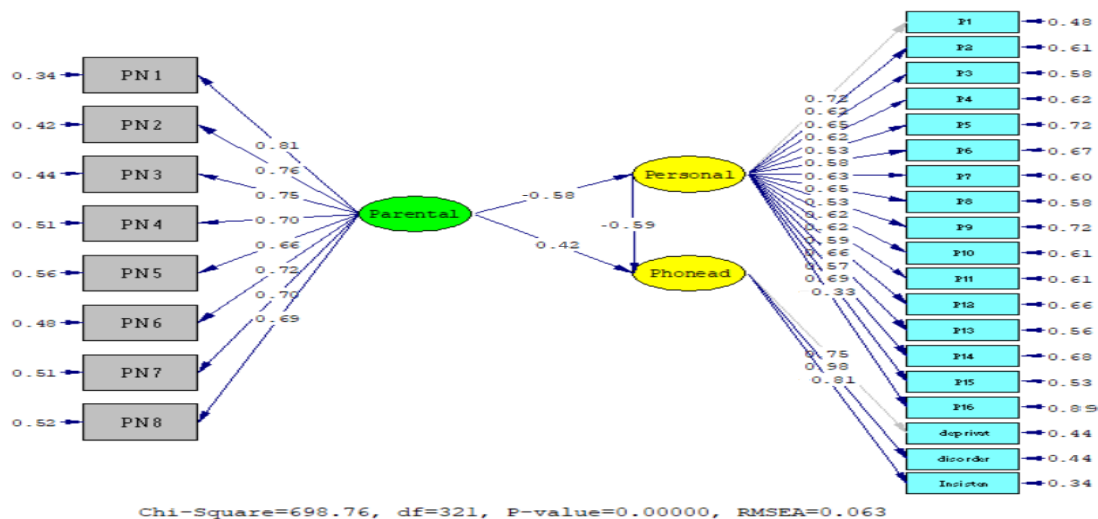


Figure 2. Standardized loadings of the model predicting mobile phone addiction based on parental neglect with the mediating role of personal growth initiative

Figure 2 shows the standardized loadings of the study model. In this study, all relationships were significant ($p < 0.05$).

Based on Figure 3 and the significance of the t-values associated with the hypothesized paths at the 0.05 significance level, the results supported the proposed structural model. Specifically, the findings indicated

that parental neglect was significantly associated with mobile phone addiction, both directly and indirectly through personal growth initiative. Thus, the hypothesis concerning the mediating role of personal growth initiative in the relationship between parental neglect and mobile phone addiction was supported.

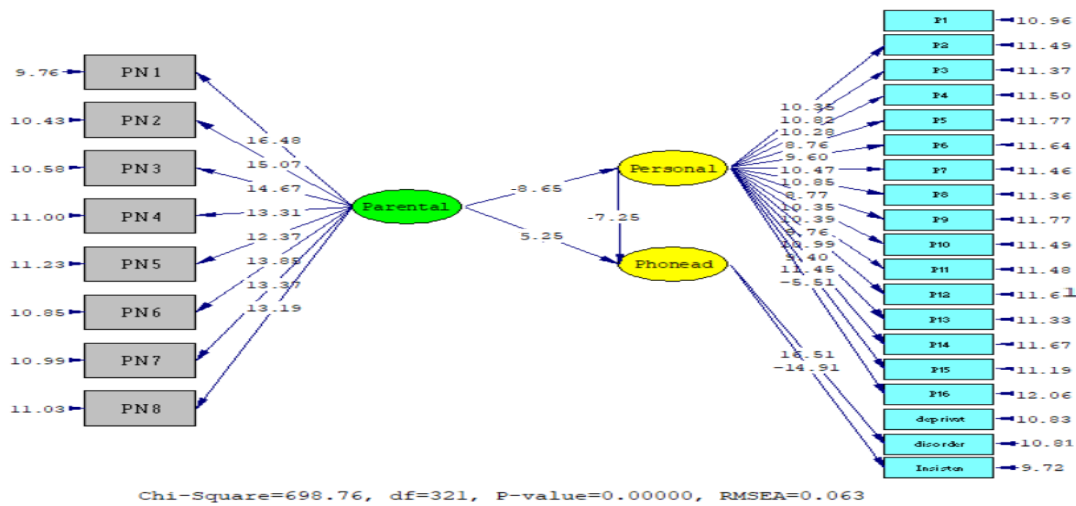


Figure 3. Presents the T-value results of the model predicting adolescents' mobile phone addiction based on parental neglect with the mediating role of personal growth initiative

Table 2. Direct and Indirect Path Coefficients of Mobile Phone Addiction Based on Parental Neglect with the Mediation Role of Personal Growth Initiative

Direct effects		Effect level	T-value	P-value	Result
Parental neglect	mobile phone addiction	0.42	5.25	0.005	confirmed
Parental neglect	Personal Growth Initiative	-0.58	-8.65	0.001	confirmed
Personal Growth Initiative	mobile phone addiction	0.59	-7.25	0.001	confirmed
Indirect effects		Effect level		T-value	Result
Parental neglect	Personal Growth Initiative	mobile phone addiction	$-0.34=0.59 \times -0.58$	5.55	confirmed

Table 2 presents the standardized path coefficients for the proposed structural model. The direct path from parental neglect to mobile phone addiction was statistically significant and positive ($\beta = 0.42$). Parental neglect also had a significant negative direct effect on personal growth initiative ($\beta = -0.58$), while personal growth

initiative had a significant negative direct effect on mobile phone addiction ($\beta = -0.59$). In addition, the indirect effect of parental neglect on mobile phone addiction through personal growth initiative was positive and statistically significant ($\beta = 0.34$), supporting the mediating role of personal growth initiative.

Table 3. Overall Fit Indices of the Final Model

Index	CMIN/DF	CFI	GFI	IFI	PNFI	RMSEA
Calculated value	2/17	0.97	0.90	0.97	0.86	0.063
Acceptable level	1-3	>0.90	>0.90	>0.90	>0.50	<0.08

To evaluate the fit of the proposed structural model to the observed data, several goodness-of-fit indices were examined, including the normalized chi-square (CMIN/DF), goodness-of-fit index (GFI), comparative fit index (CFI), incremental fit index (IFI), parsimonious normed fit index (PNFI), and root mean square error of approximation (RMSEA). The results indicated a good fit of the proposed model to the data. Specifically, the model yielded CFI = 0.98, IFI = 0.97, and GFI = 0.97, indicating a good level of comparative and absolute fit. The PNFI was 0.86, indicating an acceptable level of model parsimony. The RMSEA was 0.063, which is below the commonly accepted threshold of 0.08 and indicates an acceptable approximation error. The normalized chi-square (CMIN/DF) was also within the acceptable range. Overall, the fit indices provided support for the adequacy of the proposed structural model.

4. Discussion and Conclusion

The present study aimed to model the causal role of parental neglect in adolescents' tendency toward mobile phone addiction, with personal growth initiative as a mediator.

The results of the causal modeling indicated that parental neglect has a direct and positive relationship with adolescents' tendency toward mobile phone addiction. This finding is consistent with previous studies showing that a lack of parental attention, supervision, and emotional support can expose adolescents to risky behaviors, including unhealthy and addictive use of digital technologies (Li et al., 2024; Nazligül et al., 2023; Batool & Khurshid, 2024). From a psychological perspective, parental neglect can undermine adolescents' emotion regulation and self-control, making them more vulnerable to anxiety, depression, or psychological stress

(Nikmehr et al., 2021), which may increase their reliance on mobile phones and social media to meet emotional needs (Xin et al., 2022). Socially, a lack of parental guidance and monitoring of digital activities provides more opportunities for excessive mobile phone use, thereby raising the risk of addiction. (Mun, 2024). Consequently, the absence of consistent positive parental interaction, reduced restrictions, and limited direct supervision can create a context conducive to adolescents' digital addiction. These mechanisms indicate that parental neglect influences adolescents' mobile phone addiction both directly and indirectly, through the weakening of self-control and emotion regulation skills (Salmani et al., 2025).

The causal modeling results also indicated that personal growth initiative is directly related to adolescents' tendency toward mobile phone addiction. This finding aligns with the results of Yue et al. (2025) and Jia-Yuan et al. (2025). Personal growth initiative is a valuable internal resource that enhances an individual's ability to plan, prepare for change, and utilize environmental resources, ultimately facilitating positive development (Huang et al., 2023). According to the protective factors model of resilience, such internal resources—including coping skills, self-efficacy, and personal growth initiative—play a crucial role in shielding adolescents from the harmful outcomes of negative life experiences and reducing the severity of these outcomes (Fergus & Zimmerman, 2005). Within this framework, personal growth initiative serves as a protective factor, reducing the likelihood that adolescents will resort to maladaptive strategies such as excessive media use and mobile phone addiction. In essence, adolescents with higher levels of personal growth initiative are more capable of meeting their psychological needs through healthier methods, making them less vulnerable to social media and mobile phone addiction.

Causal modeling results indicated that parental neglect indirectly increases adolescents' tendency toward mobile phone addiction through reduced personal growth initiative. Adolescents receiving insufficient parental attention, emotional support, or supervision tend to have lower self-regulation and personal development skills, making them more prone to addictive digital behaviors (Weigold et al., 2024; Li et al., 2024; Yue et al., 2025). Psychologically, personal growth initiative refers to an adolescent's ability to actively set goals, manage personal growth, make independent decisions, and solve problems. When adolescents lack opportunities or motivation to develop these skills due to parental neglect, their self-control and behavioral regulation decline, and excessive mobile phone use becomes a substitute mechanism for meeting emotional and social needs (Chen & Guo, 2022). These findings also align with personal development and self-determination theories, which indicate that adolescents

with higher personal growth initiative possess greater psychological resources to cope with stress and emotional needs and are less prone to digital addictive behaviors (Weigold et al., 2024). This mediation operates through several psychological pathways. Personal growth initiative enhances adolescents' self-regulation, problem-solving, and decision-making skills, enabling them to cope with stress and emotions effectively. It also helps fulfill psychological and emotional needs in healthier ways (Teymoori et al., 2022), increasing resilience and self-confidence. Consequently, adolescents with higher personal growth initiative are less likely to use mobile phones as a substitute for unmet needs, serving as a protective mediator that reduces the negative impact of parental neglect on digital addiction.

Key limitations of this study include its cross-sectional design, which limits causal inference, and reliance on self-report data, which may introduce response bias. The region-specific sample also restricts generalizability. Future research should employ longitudinal, qualitative, and cross-cultural designs with multi-source data to reduce bias and explore additional mediating or moderating factors. Practically, interventions targeting parents and adolescents are recommended to enhance personal growth skills, improve family interactions, and prevent mobile phone addiction.

5. Ethical Considerations

Compliance with ethical guidelines

This study was conducted in accordance with ethical research principles. All participants were fully informed about the objectives of the study and voluntarily agreed to participate. They were assured that they could withdraw from the study at any stage without any consequences. The collected data were used solely for research purposes and kept strictly confidential. Throughout the study, the dignity and rights of the participants were respected.

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Authors' contributions

All authors contributed to the design, implementation, and writing of all parts of the article.

Conflicts of interest

The authors declare no conflict of interest.

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