

## Modeling mobile phone addiction based on original family health with the mediation of academic procrastination in high school students

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### Abstract

**Aim:** Mobile phone addiction with negative psychological consequences is influenced by academic and family problems. The present study aimed to determine the mediating role of academic procrastination in the relationship between original family health and mobile phone addiction in high school female students.

**Method:** The study employed a descriptive-correlational research approach utilizing a structural equation model. The statistical population of this research was all female students in the second year of high school in District 6 of Tehran in 2023. Among them, 200 students were recruited by random multi-stage cluster sampling, and they completed the Family of Origin Scale (1985) Academic Procrastination Scale (2000), and Mobile Phone Addiction Scale (2014). The collected data were analyzed using SPSS.21 and Amos.23 software according to the structural equation model.

**Results:** Results indicated a significant direct negative impact of family health ( $\beta = -0.51$ ,  $p < 0.001$ ) and a direct positive effect of academic procrastination ( $\beta = -0.58$ ,  $p < 0.001$ ) on students' mobile phone addiction. Furthermore, academic procrastination was found to act as a mediator in the association between family health and mobile phone addiction ( $\beta = -0.16$ ,  $p < 0.001$ ).

**Conclusion:** The model demonstrated a strong fit. The mediating role of academic procrastination in the relationship between original family health and mobile phone addiction is a good model for explaining mental injuries and applying it in the field of preventing academic and behavioral problems in students.

**Keywords:** Original family health, Academic procrastination, Mobile phone addiction, High school students.



## Introduction

During high school period, several high-risk behaviors exist that can have a significant impact on personal and academic life (Demir & Kutlu, 2018). One such behavior is smartphone addiction, which presents a chronic and intricate issue in contemporary society. Research findings suggest that adolescents and young individuals are more prone to excessive smartphone usage compared to adults (Liu et al., 2018). Smartphone and internet addiction, categorized as addictive behaviors, involve using compulsive and uncontrolled internet, leading to adverse emotional, psychological, and social consequences (Shao et al., 2018).

According to the conducted studies, it has been determined that the excessive use of smartphones can cause irreparable impairments to the physical and psychological health and other aspects of the lives of its extreme users (Shoukat, 2019; Servat-Yari et al., 2019). In this regard, researchers believe that addictive behaviors among students may be the result of their procrastination (Uzun & Ünal, 2014; Ayadi et al., 2021). Procrastination is a type of failure in self-regulation that is characterized by an undue delay in tasks that people intend to do despite expecting a negative outcome (Prem et al., 2018). One of the common forms of procrastination in schools is academic procrastination, which occurs in academic settings. In this case, the procrastinator who has to do the academic tasks or activities related to education and school, for some reason, does not have the necessary motivation to do this work in the expected time frame (Nowrin, 2018).

Numerous studies have demonstrated the increasing prevalence of procrastination among the new generation, and one of the main reasons is that these young people spend more time on social media. In this case, Geng et al. (2018) have shown in their research that internet addiction has a positive and significant correlation with procrastination. Other studies have also suggested that there is a positive and significant relationship between academic procrastination and internet addiction (Hayat, 2020; Ayadi et al., 2019). Most researchers believe that procrastination with problems such as anxiety is associated with a failure in self-regulation and low self-efficacy and is a maladaptive behavior with a variety of negative consequences (Goroshit and Hen, 2019). One of the most important factors in the etiology of behavioral-emotional problems such as addictive behaviors and academic problems among adolescents is family variables (Sutrisna et al., 2020). Therefore, the health level of the original family is among the variables that can be directly related to academic problems and addictive behavior in students. The health of the original family refers to a person's experiences at two levels of intimacy and autonomy with his parents or caregivers during childhood, which shape his interpersonal relationships in adulthood (Falcke et al., 2008). The existing research literature suggests that family, and particularly parents, play an important role in the psychosocial development of children (Mahmoudpour et al., 2021). So that they have a direct effect on the behavior, emotional security, and well-being of their children (León-del-Barco et al., 2019). The lack of intimate parent-child communication is considered one of the most intense family experiences during adolescence for parents and adolescents (Mastrotheodoros et al., 2020). Davies et al. (2007) have identified in their study that

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emotional insecurity resulting from familial arguments and conflicts manifests through three dimensions: behavioral disturbances, engagement in conflict, and negative emotional responses. These manifestations contribute to maladaptive outcomes in children, notably leading to issues such as anxiety and poor academic achievement. The emotional status of the family affects academic performance and social health (Silburn et al., 2006). The original family and its negative function can lead to failure in education, fear of failure, and addictive relationships (Walker & Shepherd, 2008). The emotional status and family relationships, as well as the ability of parents to create differentiation and autonomy in children, can be improved by increasing academic self-esteem (Chun & Dickson, 2011), the resilience of students (Murdock et al, 2023, Vali, 2019), and reducing their anxiety (Akbari, 2014) to affect academic performance.

In recent years, the use of different technologies in different areas of social activities has streamlined daily tasks, and also, following the advancement of technology and increased emphasis on the use of smart devices and technologies in educational settings, equipping schools and the easy access of students to smartphones requires the investigation of various aspects of utilizing smartphones, social media, and the internet in educational and family settings. Therefore, based on the existing statistics on the incidence of internet and smartphone addiction among educated individuals, particularly adolescent students, it is imperative to delve deeper into the underlying causes influencing students' excessive use of these technologies to identify the problematic factors and plan to solve the upcoming problems that seem to be necessary in pathology. Furthermore, despite the numerous studies (Shao, Yao-jun, 2018, Shoukat, 2019) conducted on social media and smartphone addiction, the concept of family health and its impact on addictive behaviors has been discussed less. Also limited attention has been given to exploring paths such as academic procrastination as a mediating variable. Finally, investigating the impact of smartphone addiction on the original family health through the mediation of academic procrastination, particularly among high school female students, is crucial.

The main hypotheses of the research::

There is a relationship between the original family health and students' mobile phone addiction.

Academic procrastination plays a mediating role between the original family health and mobile phone addiction in students.

## Methods

The present research was a descriptive-correlation study based on the structural equation model (SEM). The statistical population of this study was all the high school female students of the 6th district of Tehran in 2023, from which 200 students were selected by random multi-stage cluster sampling. According to the number of parameters in the model (32 parameters), the minimum sample size for this research ( $160 = 5 \times 32$ ) was 160 samples, and for better generalization of the findings, 200 samples were selected for this research (Sobahanifar, 2016). In order to control some variables, entry and exit criteria were considered for the research. Living with parents, having no history of psychological disorders and informed consent to participate in the research were among the criteria for

entering the research. Divorce and death of parents, having a history of psychological disorders were among the exclusion criteria.

The process of conducting the research and its implementation is as follows, after obtaining the necessary permits from the Research Vice-Chancellor of Azad University, in order to obtain a permit to attend schools, it was referred to the Department of Education, District 6 of Tehran. After explaining the objectives of the research to the officials of that department, the researcher attended the schools. For this purpose, first, a list of secondary girls' schools in the 6th district of Tehran was prepared, and then 5 schools were randomly selected from among them, and two classes were randomly selected from 5 schools. Then, after stating the method and duration of completing the questionnaires and considering ethical considerations such as paying attention to the informed consent of the students, not mentioning their names, the questionnaires were given to the students. After the completion of the implementation process, the questionnaires that were distorted were excluded from the analysis process. It should be noted that this number of distorted questionnaires was predicted in advance and we had considered a larger number as a sample.

### Measures:

**Academic procrastination questionnaire:** The procrastination scale was created by Schwarz and Diehl (2000). It includes 10 items, and individuals rate their agreement with each statement using a 4-point Likert scale (ranging from completely false (1) to completely true (4)); Schwarz and Diehl (2000) have reported the validity of the procrastination questionnaire through a significant correlation of .72 with the academic self-efficacy expectation questionnaire. The procrastination scale demonstrated a validity coefficient of .72, indicating a high level of validity. The reliability of this scale has been reported as .84 and .75, respectively, using Cronbach's alpha method. Ayadi et al., (2021) assessed the validity of this questionnaire using the factor analysis method, and the findings indicated the satisfactory validity of the questionnaire. In the present study, Cronbach's alpha coefficient was 0.72

**Mobile Phone Addiction Questionnaire:** This self-report questionnaire was created by Savari (2014) and consists of 13 items with 3 subscales: creativity loss (7 questions), the tendency (3 questions), and loneliness (3 questions). Answers ranged from "never (1)" to "most of the time (5)". The reliability of this tool was reported to be .87 for the whole scale and .78, .76, and, .84 for each of the subscales of creativity loss, tendency, and loneliness, respectively. Also, the validity of this tool has been confirmed using factor analysis (shahruodi, 2019). In the present study, the reliability of this questionnaire using Cronbach's alpha coefficient was .89. In the present study, Cronbach's alpha coefficient was 0.78

**Family-of-Origin Scale (FOS):** This scale was developed by Hovestadt et al., (1985). The family-of-origin scale is a 40-item measure that examines the perception and personal

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inference of the level of original family health in the two dimensions of autonomy and intimacy as two key concepts. Validation of this questionnaire has been confirmed by Karami (2009) with factor analysis method. The original family health scale has a good internal consistency with an alpha of .75 and a standardized alpha of .97. This scale has excellent reliability with a two-week retest correlation, in the independence dimension from .39 to .88 with a median of .77, and in the intimacy dimension from .46 to .87 with a median of .73. In the present study, Cronbach's alpha coefficient was 0.71

**Statistical Analyses :** The data were analyzed using SPSS.21 and AMOS.23 software. Data were analyzed using descriptive statistics (mean and standard deviation), correlation matrix, and Path analysis (Structural Model) and bootstrap test.

### Results

In the current study, 200 participants were involved, with a mean age of 17.22 years and a standard deviation of .72. Table 1 shows the descriptive information of the research variables.

**Table 1:** Descriptive information of the variables

Variable	M	SD	SK	KU
<b>Mobile Phone Addiction</b>	30.58	5.59	-1.07	1.53
<b>Academic Procrastination</b>	19.33	6.54	.81	.45
<b>Original Family Health</b>	121.01	20.76	.76	1.79

According to the results of Table 1, the mean and standard deviation of the mobile phone addiction variable are 30.58 and 5.59, and the mean and standard deviation of the academic procrastination variable are 19.33 and 6.54, respectively. The mean and standard deviation of the original family health variable are 121.01 and 24.76, respectively. Also, the skewness and kurtosis of the research variables are in the range of -2 and 2, which indicates that the research data have a normal distribution. Table 2 shows the Pearson correlation coefficient between research variables.

**Table 2:** Correlation between research variables

Variable	1	2	3
Mobile Phone Addiction	1		
Academic Procrastination	.50**	1	

Original Family Health	-.46**	-.33**	1
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\*\*P<.01

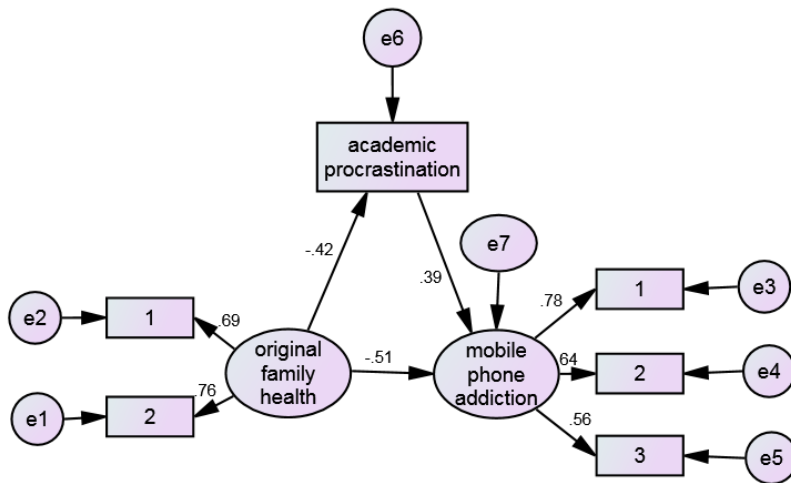
The results of Table 2 show that there is a positive and significant correlation between academic procrastination and mobile phone addiction with a coefficient of .50 at a significance level of .01. There is a negative and significant correlation between the original family health and mobile phone addiction with a coefficient of -.46 at a significance level of .01. There is a negative and significant correlation between the original family health and academic procrastination with a coefficient of -.33 at a significance level of .01. Therefore, the results related to the correlation coefficients show that there is a significant correlation between the research variables and also there is a linear relationship between the predictor, mediator, and criterion variables.

**Table 3:** Fit indices of the mobile phone addiction prediction model

Indicator	X <sup>2</sup>	Df	P	X <sup>2</sup> /df	GF	AGF	CF	NF	TL	IF	RMSEA
					I	I	I	I	I	I	A
Model	14.58	7	.04	2.08	.97	.93	.97	.95	.94	.97	.07

In order to evaluate the research model, structural equation modeling was used using AMOS software. Table 3 shows the fit indices of the model and all the indices of the model have a valid fit. Figure 1 shows the research model.





**Figure 1:** Mobile phone addiction model based on the original family health with the mediation of academic procrastination

**Table 3:** Direct and indirect paths of the model

direct path						
Predictor variable		Criterion variable	Standard coefficient	Non-standard coefficient	standard error	Sig
original family health		Mobile phone addiction	-.51	-.14	.03	.001
academic procrastination		Mobile phone addiction	.28	.11	.03	.001
Indirect path						
Predictor	Mediator	Criterion	Direction	lower limit	upper limit	Sig
original family health	academic procrastination	Mobile phone addiction	-.16	-.25	-.10	.001

Estimates presented in Table 3 indicate that the direct path of the model reveals a statistically significant relationship between the original family health trajectory and both mobile phone addiction ( $\beta = -.51, p < .001$ ). Also, the path of academic procrastination to mobile phone addiction is significant ( $\beta = -.51, p < .001$ ). Also, the bootstrap method showed that the indirect path of academic procrastination in the relationship between the health of the original family and cell phone addiction is equal to  $-.16$  with a lower limit of  $-.25$  and an upper limit of  $-.10$  at the  $.001$  level. In general, academic procrastination plays a partial mediating role in the model.

## Discussion

The findings of the present study's data analysis revealed that the health of the original family has a direct effect on mobile phone addiction in high school female students. The findings of the present study are in line with the research of Sadri et al (2020), and Sadri Damirchi et al (2022) which showed that family resilience plays an important role in their children's internet addiction.

In explaining the findings, two states of intimacy in the family system can be considered. In the first case, it can be said that the existence of family system dysfunction in the dimension of intimacy between parents (i.e., father and mother) and its perception by children causes its transmission to other subsystems such as the children's system and also makes them prone to anxiety. In such circumstances, children within families experiencing anxiety symptoms may exhibit insufficient coping mechanisms for stress, leading them to engage in addictive behaviors like alcohol consumption, drug use, or internet addiction as strategies of avoidance and emotional regulation (Murdock et al, 2023). In the second case, parents with social and interpersonal functioning have appropriate relationships with their children, teach them solution-focused coping styles, are emotionally close to their children, and act as role models for them. A decrease in the quality of emotional relationships between parents with each other and with their children leads children to turn to individuals and groups outside the family system. This factor, namely the search for security and intimacy in external environments, may facilitate the onset of the addictive use of phones and social media. In this sense, Tanni et al., (2021) in a study consistent with the present research have shown that the lack of sufficient intimacy between parents and children is associated with internalized and externalized problems, school maladjustment, and adolescent risky behaviors. Özaslan et al., (2021) have reported that parent-adolescent intimacy was related to positive social behaviors. In another study consistent with the results of the present research, Kashkuli et al., (2018) have indicated that emotional security (which is influenced by the perception of family intimacy and security) has a negative and meaningful relationship with students' adverse educational behaviors. Additionally, El-Sheikh et al. (2007) have demonstrated a correlation between emotional insecurity stemming from perceived deficiencies in familial security and intimacy, and its impact on children's sleep quality and duration, and academic achievement.





In another aspect of family health, namely independence, which is considered differentiation in Bowen's theory, it can be noted that differentiation in children by the family, particularly parents, and the recognition of their sense of autonomy and differentiation, prepares adolescents to effectively cope with stressors, a significant contributor to the inclination towards internet addiction (Vali, 2019). Various studies can be cited to support this explanation. The studies by Kricka et al. (2012) and Maddock and Garr (2004) indicated that fostering feelings of autonomy and differentiation can aid individuals in managing stress (Maddock and Garr, 2004) and enhancing resilience (Vali, 2019).

The findings of the present study also showed that procrastination has a direct effect on mobile phone addiction in high school female students ( $\beta = 0.28$ ,  $P < .001$ ). In a consistent study, Ayadi et al. (2021) have indicated that procrastination serves as a predictor of internet addiction among university students. Furthermore, Shahbazian and Khosroshahi (2017) differentiated students with academic procrastination from their non-procrastinating students by their levels of internet addiction, revealing significant differences between the two groups. Specifically, students prone to procrastination exhibited elevated levels of internet addiction.

A sense of inefficiency and self-doubt, coupled with the experience of negative emotions, are characteristics of individuals who engage in procrastination. The self-doubt stemming from academic procrastination and related issues among students can lead to significant psychological and physical effects. Some studies have shown that students' procrastination has also been associated with suicidal ideation and behaviors (Shahnaz et al., 2018). Therefore, addiction to the internet and phones may serve as a coping mechanism for students seeking respite from the adverse emotions associated with chronic procrastination and academic underachievement.

The findings of the present study showed that family health has an indirect effect on mobile phone addiction in high school female students through academic procrastination. Given the role of fear of failure in increasing avoidant and self-defeating behaviors in students, and consequently increasing academic procrastination (Waltman, 2020), the most important and fundamental factor that can affect students' fear of failure, self-evaluation, and negative motivational self-regulation is the psychological and emotional family status. Healthy and intimate families, characterized by both a perception of intimacy between family members and a sense of individual and collective autonomy, have members who are affected by unconditional acceptance from each other. According to humanistic theories such as Roger's, unconditional parental acceptance of their children raises them in a safe environment for growth and development, and they are less threatened by not being accepted for their performance (Musa et al., 2016). Therefore, in a healthy family, members are less likely to experience fear of failure and have their self-esteem threatened. Due to their greater differentiation and sense of autonomy, they also show more resilience (Vali, 2019) and consequently rely less on procrastination as a protective mechanism. Therefore, people who experience more resilience against various stressors have a high ability to accept failure and experience failure without fear of it. As a result, they procrastinate less. One of the limitations of this research was that it was limited to the population of female students without controlling some variables such as

the history of addiction in oneself and the family. Therefore, it is suggested that this model be carried out with the moderating variable of gender and by controlling the history of addiction in the family.

## Conclusion

The current study, in line with prior research, demonstrated that academic procrastination serves as a mediating factor in the relationship between original family health and the tendency towards mobile phone addiction. Hence, the findings of this study apply to examining primary prevention aspects, particularly concerning family health and its impact on students' development, education, and health. Additionally, these results can aid school counselors in formulating hypotheses to manage excessive mobile phone usage among students, presenting a promising opportunity for researchers and counselors to implement successful interventions.

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