



## Relationship between Academic Adjustment and Academic Stress in Students: Mediated by Smartphone Addiction

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### Abstract

**Introduction:** The growing use of smartphones increased the mental dependence of adolescents on these devices and reduced their social interactions. The present study aimed to investigate the mediating role of smartphone addiction in the relationships between academic adjustment and academic stress in high school students.

**Methods:** In this cross-sectional study, the structural equation modeling (SEM) technique was employed to analyze the relationship between variables. The statistical population included all female high school students of Ahvaz (Iran) within the 2022–23 academic year. The stratified cluster sampling method was employed to select 406 female students as the research sample. The research instruments included the Academic Adjustment Scale, Academic Stress Scale, and Mobile Phone Addiction Scale. The proposed model was evaluated through SEM, whereas the indirect relationships were tested through bootstrapping.

**Results:** The results indicated that there was a negative significant relationship between academic stress and academic adjustment ( $P < 0.001$ ). Moreover, there was a positive significant relationship between academic stress and smartphone addiction, whereas a significant negative relationship was observed between smartphone addiction and academic adjustment ( $P < 0.001$ ). There was also an indirect significant path from smartphone addiction to academic adjustment ( $P < 0.001$ ).

**Conclusion:** According to research results, the proposed model had a good fit. Hence, it is considered a major step in identifying the effective factors in the academic adjustment of students. In general, by reducing academic stress and addiction to smartphones, it is possible to increase the academic adjustment among high school students.

**Keywords:** Smartphone addiction, Stress, Academic adjustment, Students

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### Introduction

Starting high school education is usually stressful since it coincides with adolescence and new opportunities (1). According to the literature, these stressful factors include being afraid of failure, dealing with time management problems and exams, establishing new relationships, managing personal and emotional problems, and facing lifestyle changes (2, 3). Hence, adolescents may experience physical and mental problems, which might prevent them from adapting to the environment successfully. They are also likely to drop out of school and face social problems (4). Researchers believe that people will experience complications in different aspects of life if they fail to reach proper adjustment (5). In fact, adjustment can be defined as a process that accompanies humans since birth and emerges as specific forms in different stages of life. Dealing with intrinsic pressure and extrinsic requirements in this process, individuals try to meet their needs and

desires (6). Adjustment can determine the academic achievement and social development of students. In other words, academic adjustment has substantial outcomes on an adolescent's ability to achieve success at school (7).

Researchers believe that people will face various problems in different aspects of life if they fail to achieve proper adjustment (8). At the same time, adjustment is affected by diverse factors, one of which is academic stress (9). In educational and academic environments, individuals face informational stress or academic stress due to the abundance of information. Hence, they are no longer able to access and process new information as the informational capacities of their brains are saturated (10). This type of stress is now often observed among students in different grades. Unfortunately, individuals with this kind of stress are not mentally able to quickly analyze the masses of information that they face; hence, they will experience irreversible physical and mental traumas (11).

Stress is defined as a person's emotional and behavioral responses to some unpleasant events, in which the stress level has adverse effects on his/her behaviors and actions (12). Studies have reported that there is a negative relationship between stress and academic adjustment. In fact, stressful factors reduce academic adjustment and academic performance (13).

Smartphone addiction is a major factor that can affect academic stress among students and decrease their academic adjustment. Smartphones are proliferating on a daily basis by penetrating into different groups of society and standing for an indispensable aspect of everyday life (14). Smartphones are not used only as the means of audio communication between users (15). In fact, they are utilized for different purposes such as accessing the Internet; sending and receiving messages, images, and videos; watching films online; managing information; and administrating personal information, informational terminals, and recreational terminals (16, 17). According to studies, the growing use of smartphones increased the mental dependence of adolescents on these devices and reduced their social interactions (18). However, any downward trends in the increasing use of smartphones improved academic achievement among adolescents. The foregoing factors can either directly or indirectly affect academic adjustment of adolescents; however, intelligence is now regarded as the most important factor in predicting academic adjustment and academic performance. In other words, intelligence has been introduced as the major factor (19).

Therefore, it would be right to state that academic adjustment is among the major characteristics of every adolescent's academic life. In adolescence, individuals gain academic competence, capability, and achievement. However, adolescent students face a variety of challenges, opportunities, obstacles, and stressful issues (20, 21). Given the key roles of students in social development as well as different complications that they encounter in educational environments, it is essential to devise specific plans to deal with their academic problems. Based on the presented materials and research background, the present study aimed to investigate the mediating role of smartphone addiction in the relationships between academic adjustment and academic stress in high school students in Ahvaz.

## Methods

In this cross-sectional study, the statistical population included 2179 female senior high school students of

Ahvaz (Khuzestan Province, Iran) within the 2022–23 academic year. Two districts were randomly selected from different districts of Ahvaz. The researcher visited the education departments of the designated districts to inquire about the number of female senior high schools and obtain the research permit. After that, five schools were selected randomly. With the approval of the principals and teachers, two classes were randomly selected from each school. The research questionnaires were then distributed among participants. Finally, 406 respondents completed all questionnaires and entered the study. The inclusion criteria were an age range between 16 and 18 years, high school students, written consent for participation in the study, and not suffering from physical or mental illness. The exclusion criteria were unwillingness to continue cooperation in the research and an incomplete questionnaire. To comply with ethical considerations, we obtained informed consent from the students participating in this study and their parents. The participants were also assured that their information would remain confidential.

## Instruments

**Academic Adjustment Scale:** Designed by Anderson et al. (22), this 9-item questionnaire is scored on a five-point Likert scale (ranging from 1 for “very low” to 5 for “very high”). The minimum and maximum scores are 9 and 45, respectively. Higher scores indicate higher levels of perceived academic adjustment. Baharvand et al. (23) reported that the test-retest reliability coefficient of the Academic Adjustment Scale was 0.80.

**Academic Stress Scale:** Developed by Sun et al. (24), this 16-item questionnaire is scored on a five-point Likert scale (ranging from 1 for “strongly disagree” to 5 for “strongly agree”). The minimum and maximum scores are 16 and 80, respectively. Higher scores indicate higher levels of academic stress. Shirmohammadi et al. (25) reported a Cronbach's alpha of 0.80 for the Persian version of the Academic Stress Scale.

**Mobile Phone Addiction Scale (MPAIS):** Designed by Leng (26), this 17-item self-report scale is scored on a five-point Likert scale (ranging from 1 for “never” to 5 for “always”). The minimum and maximum scores in this scale are 17 to 85, respectively, and a higher score indicates greater dependence on mobile phones. Mazaheri and Karbasi et al. (27) reported a Cronbach's alpha of 0.86 for the MPAIS.

## Data Analysis

The Pearson correlation coefficient and structural

equations were employed to analyze the relationships between the variables. Furthermore, the structural equation modeling (SEM) technique was adopted to evaluate the proposed research model in SPSS 26 and AMOS 25.

**Results**

The participants in this study included 406 female high school students. The demographic findings indicated that their mean ( $\pm$ SD) of age was 17.34 ( $\pm$ 2.19) in the sample of students. The demographic variables of the students are presented in Table 1. As shown in Table 2, descriptive statistics (i.e., mean, standard deviation, and Pearson correlation coefficient) were used to analyze the data.

The Pearson correlation coefficients indicated that there was a significant negative correlation between academic stress and academic adjustment ( $r=-0.34$ ). In contrast, there was a positive significant

correlation between smartphone addiction and academic stress ( $r=0.40$ ). Furthermore, there was a significant negative correlation between smartphone addiction and academic adjustment ( $r=-0.44$ ). Figure 1 demonstrates the initially proposed model developed to explain academic adjustment based on academic stress and smartphone addiction.

According to Table 3, the root mean square error of approximation (RMSEA=0.052) indicated that the model had a good fit.

Table 4 reports the findings on the estimation of path coefficients for the analysis of direct and indirect relationships. According to the results, there was a direct and significant relationship between academic stress and smartphone addiction in the students ( $\beta=0.27$ ,  $P=0.001$ ). There was a negative relationship between academic stress and academic adjustment ( $\beta=-0.11$ ,  $P=0.038$ ), and between smartphone addiction and academic adjustment in the students ( $\beta=-0.37$ ,  $P=0.001$ ).

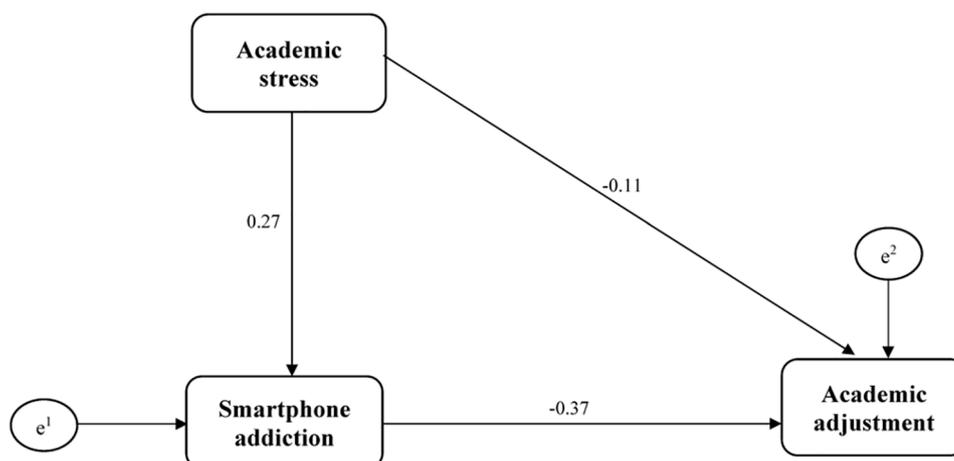
**Table 1:** Demographic variables of the students

Variables		n	%
Age (years)	15-16	124	30.54
	16-17	128	31.53
	17-18	154	37.93
Grade	10 <sup>th</sup> grade	121	29.80
	11 <sup>th</sup> grade	127	31.28
	12 <sup>th</sup> grade	158	39.92
Field of study	Mathematics	75	18.47
	Experimental sciences	153	37.69
	Humanities	178	43.84

**Table 2:** Mean, standard deviation (SD), and Pearson correlation coefficients of the study variables

Variables	Mean	SD	Academic adjustment	Academic stress	Smartphone addiction
Academic adjustment	27.26	5.53	1		
Academic stress	47.87	6.21	-0.34**	1	
Smartphone addiction	49.50	10.04	-0.44**	0.40**	1

\*\*P<0.01



**Figure 1:** The mediating role of smartphone addiction in the relationships between academic adjustment and academic stress

**Table 3:** Fit indicators in the proposed model

Fit indicators	$\chi^2$	df	( $\chi^2/df$ )	TLI	CFI	RFI	NFI	RMSEA
Proposed model	39.69	19	2.08	0.95	0.97	0.92	0.94	0.052

**Table 4:** Direct and indirect path in the proposed and final models

Paths	Proposed model	
	$\beta$	P
Academic stress → Academic adjustment	-0.11	0.038
Academic stress → Smartphone addiction	0.27	0.001
Smartphone addiction → Academic adjustment	-0.37	0.001
Academic stress → Academic adjustment through smartphone addiction	-0.64	0.001

Table 3 depicts the significance of an indirect path from academic stress to academic adjustment mediated by smartphone addiction ( $\beta=-0.64$ ,  $P=0.001$ ).

### Discussion

The present study aimed to investigate the mediating role of smartphone addiction in the relationships between academic adjustment and academic stress in high school students in Ahvaz. The first research finding indicated that there was a significant relationship between academic stress and academic adjustment. Consistent with the findings of this study, Khanjarkhani and Abbasi (28) reported that there was a significant relationship between stress and academic adjustment in college students. In other words, higher levels of perceived stress lead to lower levels of academic adjustment. High school students go through maturity and encounter different sources of academic stress and environmental stress, each of which exacerbates psychological pressure. Intelligence quotient (IQ) can play an effective role in reducing the foregoing stressors, thereby resulting in academic adjustment. In other words, adjustment is a psychological process that enables an individual to respond properly to the environment. With the help of adjustment, an individual can adapt to a social environment or an academic environment. Adaptability depends on the fact that a person changes himself/herself or makes some changes to the environment; as a result, people are coordinated with the environment (28). Academic adjustment refers to a learner's ability to cope with academic conditions and the roles that should be assumed in this regard. Moreover, the relevant stress factors often include entering high school and dealing with the stress caused by the entrance exam of universities and maturity. Thus, having a favorable IQ can alleviate the perception of academic stress and improve academic adjustment (22).

According to the results, there was a significant relationship between smartphone addiction and

academic adjustment. In other words, smartphone addiction had a negative significant relationship with academic adjustment. Consistent with the findings of this study, Kalhor and Ahghar (29) reported that there was a negative and significant relationship between Internet addiction and academic achievement in high school girls students. Moreover, the results of Dhaka and Naris's research (30) showed that there was a worthwhile correlation between Internet addiction and aggressive behavior and, as a result, academic performance in university students. Many people use smartphones for different purposes such as communicating with others, searching for information on the Internet and becoming amused. With the arrival of the new generation of smartphones that can connect to the Internet, a revolution has emerged among the users of this technology. In recent years, there has been an increase in the number of users due to ease of use. Attraction and innovations of smartphones, especially in messaging applications and social media, have encouraged more people than ever before to use this novel technology. In particular, smartphones are more popular among adolescents and youth. Despite the short history of messaging applications and social media, they have attracted countless number of users. The unreasonable and excessive use of smartphones led to a phenomenon called smartphone addiction (16). Hence, the attractiveness of smartphones made adolescents spend most of their time using smartphones, thereby falling behind in their studies and assignments. As a result, their academic adjustment decreases.

The results also indicated that there was a significant relationship between academic stress and academic adjustment mediated by smartphone addiction. The researcher found no similar studies supporting this finding. The first hypothesis indicated that there was a significant relationship between academic stress and academic adjustment. In other words, higher levels of academic stress were correlated with lower levels of academic adjustment and achievement. Regarding

the indirect path, the results indicated that academic stress had an adverse effect on a person's motivation, and his/her lack of interest led to a tendency to use smartphones repeatedly, something which would reduce academic adjustment and achievement. In conclusion, smartphone addiction mediated the relationship between academic stress and academic adjustment properly.

Since the statistical population was limited to the female adolescents of Ahvaz (Khuzestan Province, Iran), caution should be taken if the results are to be generalized to male and female students from other cities. Another research limitation was the use of a self-report tool, which might affect the reports given by participants due to their biased social utility. Hence, it is recommended that future studies should control other effective variables such as academic grades and academic averages.

### Conclusion

According to the research results, the proposed model had a good fit; thus, it is considered a major step in identifying the effective factors in the academic adjustment of students. Given the favorable fitness of the proposed model, it can be regarded as a scientific innovation that can be effective in improving academic adjustment. Iranian education experts and authorities should plan the educational environments of schools in a way that students can develop most of their positive personality traits and behavioral characteristics. Moreover, academic stress and smartphone addiction should be mitigated to enhance academic adjustment among students. Families and other effective institutions should further monitor peers, schools, and media to reduce dependence on cyberspace.

### Ethical Consideration

The study was approved by the Ethics Committee of Islamic Azad University- Ahvaz Branch (code: IR.IAU.AHVAZ.REC.1402.029).

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**Conflict of Interest:** None declared.

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