

## Association between General Health and Mobile Phone Dependency among Medical University Students: A Cross-sectional Study in Iran

### Abstract:

**Background:** Mobile phone dependency is an emerging public health problem. The aim of this study was to investigate the associations between general health and mobile phone dependency in college students. **Methods:** In this cross-sectional study, 334 students from Arak University of Medical Sciences of Iran were selected by stratified random sampling. Data were collected by (1) demographic checklist, (2) 27-item Mobile Phone Problem Usage Scale, and (3) General Health Questionnaire-28 (GHQ-28). **Results:** Mean scores of mobile phone dependency and GHQ-28 were  $119.83 \pm 43.53$  and  $23.73 \pm 12.77$ , respectively. In multiple linear regression, age, family economic status, anxiety and sleep disorder, and social dysfunction were the main significant predictors of mobile phone dependency ( $R = 0.469$ ,  $R^2 = 0.220$ , adjusted  $R^2 = 0.203$ ). **Conclusions:** Based on the finding of this study, prevention strategies for management of mobile phone use in students can be adopted.

**Keywords:** Cell phones, dependency, health, students, universities

### Introduction

Mobile phone as one of the most prominent kinds of information and communications technology has quick development and widespread use during the past few years around the world.<sup>[1,2]</sup> It is believed that a life without mobile phone is difficult because in addition to being used as a phone, it is used as a calculator, video game player, camera, computer, storehouse of information, play station, and music system and is used for checking e-mail.<sup>[3,4]</sup> This widespread and increasing usage of mobile phone has some psychological and physical dependency leading to behavioral changes.<sup>[3,5]</sup> It can be said that mobile phone dependency is an emerging public health problem<sup>[6,7]</sup> and the term nomophobia is used in literature for dependence on mobile phone.<sup>[3]</sup> On the other hand, use of mobile phone is prevalent amongst youth and college students.<sup>[4]</sup> Due to the wide and undeniable applicability of mobile phone in communication and interactions, it is important to study its possible negative health effects. The aim of this study was to investigate the associations between general health and mobile phone dependency in the college students.

### Methods

This cross-sectional study was conducted among 334 students from Arak University of Medical Sciences, Iran. Students from different schools of Arak University of Medical Sciences who used mobile phone for >1-month duration were included in the study. Students were selected by stratified random sampling so that schools were considered as categories and students were randomly selected. Data were collected by one demographic checklist and also by two valid and reliable questionnaires. To investigate the mobile phone dependency status of students, Persian version of Bianchi and Phillips 27-item Mobile Phone Problem Usage Scale (MPPUS) questionnaire was used.<sup>[8,9]</sup> Validity of Persian version of MPPUS has been approved in Iran by convergent, discriminative validity and exploratory factor analysis and also its reliability has been approved by alpha Cronbach's coefficient = 0.90 and by spilt-half method = 0.95.<sup>[9]</sup> The score for MPPUS ranges from 27 to 270, with high scores indicating higher dependence. Also, the General Health Questionnaire-28 (GHQ-28) was used to study the health status among the study participants. GHQ-28 has been developed by Goldberg and Hillier,

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consisting of four domains: somatic symptoms, anxiety and sleep disorder, social dysfunction, and depression.<sup>[10]</sup> Validity and reliability of Persian version of GHQ-28 has been approved in Iran by Noorbala *et al.*<sup>[11]</sup>

Data analysis was carried out by the SPSS-20 software (IBM Corp: Armonk, NY.) and Stata-12 using descriptive and analytic statistics including Pearson's correlation, independent *t*-test, one-way analysis of variance, and multiple linear regression analysis. For ethical considerations, oral informed consent was obtained from students and also the research proposal was approved by Deputy of Research and Ethics Committee of Arak University of Medical Sciences with ethic number 93-176-13.

## Results

In this study, 334 students from Arak University of Medical Sciences were included. Mean and standard deviation (SD) of the students was  $22.29 \pm 3.50$  years. Among students who participated in the study, 70 (21%) were male and 264 (79%) were female. Other demographic characteristics of students are shown in Table 1. Mean and SD of mobile phone dependency score was  $119.83 \pm 43.53$ , and the total score of GHQ was  $23.73 \pm 12.77$ . The highest score for GHQ was seen in social dysfunction and the lowest score was in depression symptoms.

The results of Pearson's correlation test showed a positive correlation between mobile phone dependency and total score of GHQ ( $r = 0.406$ ,  $P < 0.001$ ) and also subscales of GHQ including somatic symptoms ( $r = 0.316$ ,  $P < 0.001$ ), anxiety and sleep disorder ( $r = 0.391$ ,  $P < 0.001$ ), social dysfunction ( $r = 0.311$ ,  $P < 0.001$ ), and depression symptoms ( $r = 0.314$ ,  $P < 0.001$ ). So, with the increasing dependency scores, the GHQ score (which indicating the disorder) also increased.

In terms of the demographic and socioeconomic variables, students' age showed a significant negative correlation with mobile phone dependency score ( $r = -0.135$ ,  $P = 0.014$ ). Also, the mean score of dependency was reported higher in students with a high level of economic status [Table 1]. Although the mean score was slightly higher in female students, this difference was not significant. Other variables did not show significant association with mobile phone dependency [Table 1].

Finally, the linear regression model was used to predict the effects of study variables on the mobile dependency. The crude analysis was conducted for all variables and the variables that were significant at  $P \leq 0.2$  in univariate analysis were entered into the multiple linear regression model [Table 2]. The results showed that age, family economic status, anxiety and sleep disorder, and social dysfunction are the main significant predictors of mobile phone dependency ( $R = 0.469$ ,  $R^2 = 0.220$ , adjusted  $R^2 = 0.203$ ).

**Table 1: Comparison of mobile phone dependency among students based on the demographic and socioeconomic characteristics**

Variable	n (%)	Mean±SD	P*
Sex			
Female	264 (79)	122.02±43.95	0.076
Male	70 (21)	111.61±41.19	
Marital status			
Single	295 (88.3)	120.33±44.01	0.570
Married	39 (11.7)	116.10±40.04	
Residency			
Dormitory	277 (82.9)	120.98±43.51	0.289
Home	57 (17.1)	114.23±43.57	
Family economic status			
Low	23 (6.9)	100.74±49.39	0.024
Middle	295 (88.3)	120.31±43.01	
High	16 (4.8)	138.50±36.01	
Educational level			
Bachelor's degree	272 (81.4)	120.10±43.51	0.840
Master's degree	10 (3)	111.80±45.94	
Doctorate degree	52 (15.6)	120.02±43.90	
Mother's job			
Homemaker	286 (85.6)	118.50±42.32	0.172
Employed	48 (14.4)	127.79±49.89	
Father's job			
Self-employment	120 (39)	120.21±44.99	0.402
Administrative jobs	93 (30.2)	125.05±43.56	
Workers or Farmers	35 (11.4)	115.51±39.60	
Retired	60 (19.5)	113.28±46.59	
Father's education			
Illiterate	11 (3.7)	126.73±48.33	0.780
Elementary	35 (11.7)	119.94±40.89	
Primary	59 (19.8)	123.61±46.96	
Secondary	92 (30.9)	115.47±45.73	
Academic education	101 (33.9)	122.05±44.13	
Mother's education			
Illiterate	13 (4.4)	116.84±52.49	0.694
Elementary	54 (18.2)	120.00±45.23	
Primary	51 (17.2)	111.88±41.17	
Secondary	115 (38.9)	122.97±45.43	
Academic education	63 (21.3)	120.48±45.98	

\*Independent *t*-test and one-way ANOVA test

## Discussion

This research showed that there is a significant relationship between student's age, economic status, and general health with their mobile phone dependency. In the multiple linear regression analysis, age, economic status, anxiety and sleep disorder, and social dysfunction were the main significant predictors of mobile phone dependency.

The present study revealed that young students had higher levels of mobile phone addiction. This matches with the results of previous researches,<sup>[8,12]</sup> which may be due to various reasons. Bianchi believes that younger people due to cultural factors have more tendency than

**Table 2: Multiple regression analysis for predictors of mobile phone dependency**

Predictors	Unadjusted			Adjusted		
	Coefficient	SE	P	Coefficient	SE	P
Marital status (married vs. single)	-4.23	7.42	0.570			
Residency (home vs. dormitory)	6.76	6.33	0.286			
Educational level						
Bachelor's						
Master's	-8.29	14.05	0.555			
Doctorate	-0.076	6.61	0.991			
Father's education <sup>a</sup>	-0.54	2.28	0.813			
Mother's education <sup>a</sup>	1.45	2.29	0.525			
Mother's job (employed vs. homemaker)	9.29	6.78	0.172	-1.36	6.26	0.828
Age <sup>a</sup>	-1.68	0.68	0.014	-1.36	0.63	0.031
Sex (female vs. male)	10.40	5.83	0.076	5.53	5.37	0.304
Family economic status <sup>a</sup>	18.99	6.92	0.006	20.89	6.42	0.001
Somatic symptoms <sup>a</sup>	3.55	0.58	<0.001	0.75	0.74	0.320
Anxiety and sleep disorder <sup>a</sup>	4.15	0.54	<0.001	2.75	0.75	<0.001
Social dysfunction <sup>a</sup>	4.19	0.70	<0.001	2.08	0.86	0.016
Depression symptoms <sup>a</sup>	3.15	0.52	<0.001	0.20	0.71	0.778

<sup>a</sup>Per one unit increasing. SE=Standard error

older people to embrace new technologies such as mobile phone.<sup>[8]</sup> Adolescents and young people, through technological resources, attempt to reinforce personal autonomy and provide identity in relationships with peers.<sup>[2]</sup>

In the present study, the mean score of dependency was reported to be higher in students with a high level of economic status. Also in the regression model, economic status was one of the significant predictors of mobile phone dependency. Nowadays, the socioeconomic status is one of the most important health determinants.<sup>[13]</sup> Students with good economic situation, due to affordability, may be more inclined to embrace new technologies such as mobile phone compared with students who cannot afford to buy phones with advanced technology.

In this research, a positive correlation was seen between mobile phone dependence and total score and also subscales of GHQ. Anxiety and sleep disorder and social dysfunction were the main significant predictors of mobile phone dependency. In literature, the intensity of mobile phone usage was related to mental health and healthy lifestyle,<sup>[14,15]</sup> and as the rate of mobile addiction becomes less, the students' mental health and healthy lifestyle increase. The results of Thomée *et al.* study in Sweden in young adults aged between 20 and 24 years showed that there are associations between high mobile phone use and stress and sleep disturbances.<sup>[1]</sup> Anxious people to reduce stress and pressure in life might be inclined to even more addictive behaviors and they use phone calling and text messaging or other social networks in phone to reduce interpersonal anxiety.<sup>[16]</sup>

About association between social dysfunction and mobile phone dependency, it can be said that students with more

social dysfunction may be afraid of interpersonal relationships or face-to-face situations and therefore most of the time, communicate with others through mobile phones.<sup>[17]</sup>

This study has some limitations that should be noted. The design of the study was cross sectional and additional longitudinal analyses are necessary to examine associations between the mobile phone dependency scale and general health. Also, this study did not examine the pattern of use of the mobile such as phone calls, text messaging, or other applications in mobile phone.

## Conclusions

In this research, age, family economic status, anxiety and sleep disorder, and social dysfunction were shown to account for 20.3% of the variance for mobile phone dependency. Based on this finding, prevention strategies for management of mobile phone use in students can be adopted.

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## Conflicts of interest

There are no conflicts of interest.

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