Research Article

Investigating the Relationship Between Excessive Use of Mobile Phones and Social Loneliness in the Student Community

Sadaf Yahyaei [1], Omid Garkaz (iD) [2], Sahar Paryab [3], Sepideh Mahdavi [4], Somayeh Ramezani [1], Mahbobeh Pourheidari [3], [*]

[1] Bahar Hospital, Shahroud University of Medical Sciences, Shahroud, Iran
[2] Department of Epidemiology, School of Public Health, Shahroud University of Medical Sciences, Shahroud, Iran
[3] School of Nursing and Midwifery, Shahroud University of Medical Sciences, Shahroud, Iran
[4] Ph.D Student of Epidemiology, Department of Epidemiology, School of Public Health, Iran University of Medical Sciences, Tehran, Iran

[*]*Corresponding Author:* School of Nursing and Midwifery, Shahroud University of Medical Sciences, Shahroud, Iran. Email: poorheidari@shmu.ac.ir

Abstract

Background: While the growth of communications and technology has provided opportunities in various fields, such as speeding up work and reducing distances, it can also pose a threat. Dependence on mobile phones can lead to a sense of loneliness and undesirable social support.

Objectives: This study was conducted to investigate the relationship between excessive use of mobile phones and social loneliness in the student community.

Methods: This descriptive-analytical study was conducted using cluster sampling on 384 students of Shahroud University of Medical Sciences in 2019. Data were collected using demographic information questionnaires, the Harmful Use of Mobile Phones Scale, and the Adult Social and Emotional Loneliness Scale. After collection, the data were entered into SPSS18 and analyzed using descriptive and analytical statistics.

Results: The results showed that the total mean of the emotional and social loneliness questionnaire was 34.31 ± 8.98. An inverse relationship was observed in all areas of loneliness, except for family loneliness, with excessive use of mobile phones. Only the inverse correlation between excessive use of mobile phones and romantic loneliness was statistically significant. A positive and strong correlation was observed between excessive use of mobile phones and depression score. There was an inverse relationship between the social loneliness score and factors such as student age, educational level, marital status, birth order, mother's age and years of education, father's age, father's years of education, and excessive use of mobile phones. Additionally, there was an inverse relationship between excessive use of mobile phones and marital status with students' loneliness; as mobile phone use increased, the feeling of loneliness decreased, and as students' status changed from single to married, the feeling of loneliness also decreased.

Conclusions: Given the relationship between some subgroups of social loneliness and demographic variables with mobile phone use, researchers and psychotherapists should control these factors to improve the quality of life and mental health of students.

Keywords: Mobile Phone, Social Loneliness, Excessive Use, Students

1. Background

Due to the rapid development and widespread use of mobile phones, as well as their increasing impact on human communication and interactions, it is important to study the possible negative effects of mobile phone use on its users. Nowadays, the use of mobile phones and other information and communication technologies has become an integral part of people's lifestyles, allowing them to communicate with global networks anywhere and anytime, even during sleep, through Internet access and

mobile phones. While the growth of communication and technology has accelerated work and reduced distances, it can also pose a threat to users, potentially causing problems in their lives and health (1-3).

Despite the advantages that the Internet brings to modern humans, this new communication technology can act as a double-edged sword, presenting many disadvantages and problems, especially for the younger generation. Researchers in the field of Internet psychology, such as Talbot, Young, Kendall, Davis et al., Anderson, and Lan-hua et al., have emphasized the addictive nature of the Internet, particularly among young people (4, 5). Students are considered one of the most important human resources of a country and play a significant role in its development and progress. Therefore, examining the factors affecting their growth, satisfaction of psychological needs, and provision of physical and psychological health is of great importance (6).

Among new communication technologies, mobile phones are considered one of the most important, providing an independent personal privacy while facilitating social relationships within social networks and enabling self-expression of identity and individualism. One reason for emotional dependence on mobile phones is their constant availability, allowing for cheaper and more widespread use to alleviate feelings of loneliness and social isolation (7). The excessive use of mobile phones has grown significantly, drawing researchers' attention to their biological effects (3). Most students use mobile phones in various ways, and one of their hobbies is using mobile phones to communicate with each other (8).

Excessive use of mobile phones creates significant mental preoccupation for users (9). This can lead to inappropriate behaviors such as staying awake at night to make calls and exchange messages, mental turmoil, disturbed sleep patterns, a lack of a sense of liberation, constant busyness, and feelings of guilt due to the inability to respond to all calls and messages (10). Addictive use of mobile phones can cause social isolation and withdrawal, with feelings of loneliness associated with psychological characteristics such as impulsivity, aggression, introversion, low self-esteem, shyness, and shame (11). Various studies have highlighted the harmful role of loneliness (12). Loneliness is an unpleasant experience accompanied by observable behavioral problems such as sadness, anger, and depression, and a gap between an individual's expectations and desires compared to their current level. The greater the gap, the more lonely the individual feels and avoids contact with others (13).

Yaseminejad et al. showed that reduced social relationships, social isolation, and increased loneliness in some excessive mobile phone users are among the likely side effects or consequences of frequent mobile phone use. In general, addictive use of mobile phones causes isolation and loneliness in individuals (8). In a study by Alavi et al., which examined the relationship between psychiatric symptoms and Internet addiction in university students in Isfahan, results indicated a positive and significant correlation between psychiatric disorders such as depression, anxiety, self-morbidity, obsession, interpersonal sensitivity, aggression, paranoia, phobia, and psychosis, and the three indices GSI, PSDI, and PST with Internet addiction (14). Research shows that for every hour of Internet use at home, a young person loses half an hour of direct contact with family members, leading to withdrawal from society (15).

The growing volume of research on Internet addiction indicates that this disorder is a type of psychosocial disorder characterized by tolerance, withdrawal symptoms, emotional disturbances, and disruption of social relationships (16). Reviewing previous studies suggests that the exact cause of the relationship between these clinical variables and Internet addiction has not yet been determined. It is possible that these psychological problems predispose a person to Internet addiction, or perhaps these disorders are caused by Internet addiction, meaning that people who become addicted to the Internet experience negative consequences such as depression and anxiety, requiring further studies and investigations (17).

2. Objectives

Given the different results of research on excessive use of mobile phones and social loneliness in different groups, this study was conducted to investigate the relationship between the amount of mobile phone use and feelings of loneliness among students of Shahroud University of Medical Sciences.

3. Methods

This descriptive-analytical study was conducted using a cluster sampling method on 384 students from four faculties (Faculty of Health: 13 clusters, Faculty of Nursing and Midwifery: 19 clusters, Faculty of Paramedical Sciences: 14 clusters, Faculty of Medicine: 13 clusters) of Shahroud University of Medical Sciences. At the beginning of the study, entry and exit criteria were established. The entry criteria included students in the 2nd semester and above studying at Shahroud University of Medical Sciences, having a smartphone for

at least one year, and completing an informed consent form. Exclusion criteria included individuals who self-reported having a serious mental or physical illness, individuals who had recently suffered from severe depression, and those unwilling to complete the questionnaires.

Three demographic questionnaires, the Harmful Cell Phone Use Scale, and the Social and Emotional Loneliness Scale for Adults (SELSA-S) were used to collect data. The demographic questionnaire included 21 items related to the personal and educational information of the research subjects. To assess excessive cell phone use, the Cell-Phone Over-Use Scale (COS) Questionnaire, which includes 23 items to measure harmful use of the phone, was used. This scale was developed based on ten psychological indicators from the DSM and is scored on a six-point Likert scale from never (1 point) to always (6 points). In a study conducted to examine the validity and reliability of the Persian version of this questionnaire, 21 of its items were found to have adequate validity (10). The sum of the scores of 21 questions indicates the subject's overall score. The higher the individual's score, the more excessive their cell phone use is. In addition, to classify excessive use, a score of 25 and below is classified as a low user, a score between 26 and 75 as a moderate user, and a score above 75 as an excessive user (10). The validity of the test was calculated using the Cronbach's alpha method as 0.903. The test-retest reliability of the scale was calculated to be r = 0.714, which was significant at the 0.001 level. The split-half validity study indicated no significant difference between the two halves of the test. Overall, the findings showed that the scale is a valid tool for conducting field research, and its validity and reliability are satisfactory.

To measure social loneliness, the Adult Social and Emotional Loneliness Scale (SELSA-S) Short Form Questionnaire was used. This scale was designed by Di Tomaso et al. (2004) with 15 items and reported a Cronbach's alpha coefficient between 0.87 and 0.90. To examine the validity and reliability of the Persian version of this questionnaire, Jokar and Salimi (2011) showed that the alpha coefficient for the romantic, social, and family loneliness subscales was 0.92, 0.84, and 0.78, respectively. Factor analysis methods, correlation with the social support perception subscales, and the life satisfaction scale were also used for the validity of the scale. Overall, it was found that the scale has good validity and reliability. The Persian version of this scale includes 14 items and three subscales of romantic loneliness (4 items), family (5 items), and social (5 items). Emotional loneliness is

obtained from the sum of the scores of the romantic and family subscales. Each item is on a five-point Likert scale from strongly disagree (1 point) to strongly agree (5 points). To obtain the overall score of the questionnaire, the sum of the scores of the individual questions is calculated together, and to obtain the score of each dimension, the sum of the scores related to the questions of that dimension is calculated together. The feeling of emotional loneliness is the sum of the scores related to the dimensions of romantic loneliness and family loneliness. Lower scores in each dimension indicate that the respondent feels more lonely in that dimension, and vice versa.

The data were then entered into SPSS18, and the mean and standard deviation were used to describe the quantitative variables, while frequency and frequency percentage were used to describe the qualitative variables. Given the normal distribution of the data, parametric analyses were used. Linear regression analysis and Pearson correlation were used to determine the relationship between the quantitative and qualitative variables. Finally, to determine the factors affecting depression, multiple linear regression analysis with the Stepwise method was used.

4. Results

In this study, the results showed that the average age of the students was 22.16 ± 3.41 years. Of the total sample, 84.8% were single, 78.4% were non-native, and 67% lived in university dormitories. Among the students, 106 (35.6%) were studying at the master's level, and 247 (84%) reported an interest in their field of study. Among the participants, 208 (70.3%) did not report financial problems, while 63 (21.3%) reported minor financial problems, and 25 (8.4%) reported having financial problems. A small number of students (35 vs. 263) had other jobs in addition to their studies. The majority of students (94.1%) lived with both parents. The average age of the students' fathers was 52.43 ± 7.18 years, and the average age of the mothers was 47.73 ± 6.39 years (Table 1).

The total mean of the emotional and social loneliness questionnaire was 34.31 ± 8.98. Based on Pearson correlation coefficients, an inverse relationship was observed between excessive use of mobile phones and all areas of loneliness except family loneliness. Only the inverse correlation between excessive use of mobile phones and romantic loneliness was statistically significant. Additionally, a strong positive correlation was observed between excessive use of mobile phones and depression score (Table 2).

Table 1. Demographic Factors of Participating Students

Variables	No. (%) or Mean ± SD
Degree	
Bachelor's degree	192 (64.4)
Master's degree	106 (35.6)
Field of study interest	
Yes	247 (84)
No	47 (16)
Native status	
Native	64 (21.6)
Non-native	232 (78.4)
Residence	
Dorm	199 (67)
Private house	63 (21.2)
Rental house	15 (11.8)
Marital status	
Single	251 (84.8)
Married	45 (15.2)
Employment status	
Employed	35 (11.7)
Unemployed	263 (88.3)
Mother's occupation	
Housewife	212 (72.1)
Employee	82 (27.9)
Father's occupation	
Freelance	137 (47.9)
Employee	139 (48.6)
Unemployed	10 (3.5)
Family living situation	
Both parents	271 (94.1)
One parent	17 (5.9)
Financial problems	
Yes	25 (8.4)
No	208 (70.3)
Partial	63 (21.3)
History of taking antidepressants	
Yes	33 (11.2)
No	261 (88.8)
Birth order	
First child	132 (44.4)
Second child	81 (27.3)
Third child	40 (13.5)
Fourth child and above	44 (14.8)
Quantitative variables	
Student age	22.16 ± 3.41
Mother's age	47.73 ± 6.39
Father's age	52.43 ± 7.18
Mother's years of education	12.10 ± 4.35
Father's years of education	13.02 ± 4.40

Based on the results of linear regression analysis in Table 3, there was an inverse relationship between the Pearson correlation coefficient (standardized coefficient) and the social loneliness score with variables such as the student's age, educational level, marital status, birth order, mother's age and years of education, father's age, father's years of education, and excessive use of mobile phones. Among these, only the student's age and marital status showed a significant relationship (P-value < 0.05), suggesting that these

Table 2. Results of Pearson Correlation Coefficient Between Depression and Loneliness Domains with Excessive Use of Mobile Phones

Variables	Mean ± SD	Min - Max	Pearson Correlation Coefficient	P-Value
Total loneliness	34.31 ± 8.98	14 - 70	-0.067	0.247
Romantic loneliness	11.94 ± 5.65	3 - 20	-0.118	0.042
Family loneliness	11.31 ± 4.01	4 - 25	0.024	0.0675
Social loneliness	11.05 ± 2.90	5 - 25	-0.12	0.840
Emotional loneliness (romantic + family)	23.25 ± 7.55	9 - 25	0.075	0.194
Depression	61.65 ± 24.63	11 - 143	0.447	0.001
Excessive cell phone use	52.05 ± 15.70	21 - 96	1	-

Table 3. Results of the Correlation Coefficient Between the Score and Depression Risk Factors

Variables	Pearson Correlation Coefficient	*t*-Statistic	Significance Level
Student's age	-0.153	-2.66	0.008
Academic field	-0.008	-0.13	0.134
Interest in field of study	0.222	3.89	0.0001
Marital status	-0.328	-5.96	0.001
Native status	0.51	0.883	0.378
Residence	0.73	1.25	0.210
Employment status	0.13	2.34	0.020
History of taking antidepressant medication	0.098	1.68	0.094
Birth order	-0.099	-1.70	0.09
Financial problems	0.225	3.95	0.001
Family life situation	0.008	0.13	0.893
Mother's age	-0.109	-1.84	0.065
Mother's occupation	0.030	-0.52	0.604
Mother's years of education	-0.031	-0.479	0.633
Father's age	-0.056	-0.921	0.358
Father's occupation	0.014	0.244	0.808
Mother's years of education	-0.026	-0.397	0.692
Excessive use of mobile phones	-0.043	-0.740	0.460
Depression	0.312	5.64	0.001

variables are likely to reduce the feeling of loneliness in individuals.

Additionally, among the risk factors that had a positive and significant relationship with the feeling of loneliness in students, the highest correlation coefficients were related to depression, having financial problems, interest in the field, and the student's employment status, respectively. These factors are likely to increase the feeling of loneliness in students.

The results of the linear regression analysis, with a coefficient of determination (R^2) of 0.259, showed a relatively low correlation between the factors affecting loneliness and the occurrence of loneliness. The adjusted coefficient of determination (adjusted R^2)

indicates that 24.4% of the changes in loneliness are related to the risk factors listed in Table 4.

Based on the results presented in Table 5, after entering all the demographic variables from Table 1, along with the scores from the excessive use of mobile phones and depression questionnaires, into a multiple linear regression analysis using the Stepwise method, the variables of depression status, excessive use of mobile phones, marital status, and financial problems were found to significantly affect an individual's sense of loneliness and remained significant in the model.

The results indicate an inverse relationship between excessive use of mobile phones and marital status with the students' sense of loneliness. As mobile phone use increases, the sense of loneliness decreases, and as students' status changes from single to married, the

Table 4. Results of Analysis of Variance from Multiple Linear Regression of Depression and Factors Affecting It

Variables	Sum of Squares	Mean of Squares	F-Statistic	Significance
Regression	4472.599	1118.150	17.297	0.001
Residual	12799.667	64.645	-	-
Total	17272.266	-	-	-

Table 5. Results of Multiple Linear Regression Analysis of Depression and Its Influencing Factors

Models	Non-standard Coefficient		Standardized Coefficient	t-Statistic	Significance
	B	Standard Error	Beta		
Fixed coefficient	42.674	3.08	-	13.832	0.001
Depressive status	0.125	0.025	0.342	4.969	0.001
Excessive use of mobile phone	-0.197	0.041	-0.324	4.856	0.001
Marital status	-7.574	1665	-0.279	-4.550	0.001
Financial problems	2.351	0.919	0.163	2.557	0.011

sense of loneliness also decreases. Conversely, an increase in depression scores and the presence of financial problems strengthen the sense of loneliness in individuals.

5. Discussion

Although mobile phones have made it possible to connect with friends at any time, they have also brought negative aspects [18]. Decreased social relationships, social isolation, and increased feelings of loneliness among some excessive mobile phone users are among the most likely consequences of frequent use of mobile phones [7]. Loneliness is an unpleasant feeling that results from a person's decreased social relationships and the lack of close and desirable relationships with loved ones [12]. On the other hand, the mental health of young people is considered an important topic in psychology and sociology, and today, one of the hobbies of students is using mobile phones to communicate with each other.

The average mobile phone usage among students was 52.05 ± 15.70, representing an average level of mobile phone usage, and the average social loneliness was 34.31 ± 8.98, which are inversely related to each other. In fact, students who use mobile phones more feel more lonely. In Mansoorian's study, as well as in Ashok and Bhardwaj's study [19], the mobile phone usage score was also at an average level and had an inverse relationship with the samples' feelings of loneliness, consistent with this study [20]. In the study by Jafari et al. in 2019, students who used mobile phones more felt less lonely, which was not consistent with the findings of this study [21].

Additionally, it was found that those who had financial problems felt less lonely, possibly due to increased mental concerns and spending time earning money. People who had a higher score on mobile phone usage, with increasing age, interest in their field of study, and marital status, felt lonelier. Considering the questions of the SELSA-S loneliness questionnaire, especially in the emotional area, most questions are related to couples, so single people may not have given appropriate answers. It is suggested that the questionnaires be adapted to our culture and that this loneliness questionnaire be designed separately for married and single people.

According to the results of this study, there is an inverse correlation between mobile phone use and feelings of loneliness. In fact, the more people use their mobile phones, the lonelier they become. In a study by Yang in 2012, it was shown that daily life pressures, the level of resilience of individuals, and the type of social support perceived by individuals are also factors affecting the tendency towards Internet addiction [22]. In the study by Naderi and Sajadian [23], the results also indicated that there is a negative and significant relationship between extraversion, conscientiousness, agreeableness, quality of social relationships, and psychological quality of users with Internet addiction. This means that people addicted to the Internet have a lower tendency to communicate and connect. Excessive dependence on the virtual world leads to a person's separation from the real world and lack of mobility in communication, which reduces happiness and social

interactions, and engages the user's mind in dysfunctional fantasies that result in nothing but depression, anxiety, and social isolation.

According to studies by Yang et al. (22), 5 to 10 percent of the world's online population was addicted to the Internet at the time of their study, with about 54 percent of addicts having a history of depression and 34 percent having a history of anxiety, worry, and stress. Studies by Dargahi and Razavi (24) on 732 Internet users aged 15 - 39 years showed that 30% of Internet addicts exhibited varying degrees of social withdrawal and antisocial behaviors. Favaretto et al. concluded in their study that there is a significant relationship between hours of Internet use and mental health scores, indicating a clear relationship between excessive Internet use and mental disorders (25). The study by Cheng and Man-Law also confirms that gender and economic status have a direct and significant relationship with Internet addiction (26). Additionally, in a study by Alavi conducted on 233 students in Isfahan, it was found that the gender of students is related to Internet addiction (27).

One of the strengths of this study is addressing an important issue such as Internet addiction at the university level, which is vital given the increase in Internet use, especially during the COVID-19 pandemic. However, the study's cross-sectional nature, small sample size, and focus on students from only one university are limitations. It is suggested that future studies be conducted with a larger sample size and include multiple universities to generalize the findings. The use of correlational and longitudinal designs, conducting the study over a longer period to identify psychological problems, and incorporating other methods such as clinical interviews in addition to questionnaires are recommended.

5.1. Conclusions

According to the results of this study, it is important to pay serious attention to the emerging phenomenon of Internet addiction, which is most prevalent among the younger generation. Mental health professionals and community officials should have the necessary knowledge about the psychological problems related to excessive Internet dependence. The findings of this study also highlight the importance of preventive measures in the form of educational and counseling programs for students regarding the correct and beneficial use of the Internet. Addressing issues and problems associated with the incorrect use of communication technologies such as the Internet can pave the way for proper education and greater attention

from parents and families for the appropriate and effective use of the Internet.

Acknowledgements

Footnotes

Authors' Contribution: Study concept and design: S. Y. and O. G.; Analysis and interpretation of data: S. P. and S. M.; drafting of the manuscript: S. R.; Critical revision of the manuscript for important intellectual content: M. P., S. R., and O. G.; Statistical analysis: S. P.

Conflict of Interests Statement: The authors have no conflict of interest to declare.

Data Availability: The dataset presented in the study is available on request from the corresponding author during submission or after publication.

Ethical Approval: This study is supported by the Vice Chancellor for Research of Shahroud University of Medical Sciences and is derived from the research project with code 9900062 and ethics code IR.SHMU.REC.1399.080 .

Funding/Support: This study is supported by the Vice Chancellor for Research of Shahroud University of Medical Sciences.

Informed Consent: The entry criteria included students in the 2nd semester and above studying at Shahroud University of Medical Sciences, having a smartphone for at least one year, and completing an informed consent form.

References

1. Johansson A, Nordin S, Heiden M, Sandstrom M. Symptoms, personality traits, and stress in people with mobile phone-related symptoms and electromagnetic hypersensitivity. *J Psychosom Res*. 2010;**68**(1):37-45. [PubMed ID: 20004299]. https://doi.org/10.1016/j.jpsychores.2009.06.009.

2. Van den Bulck J. Adolescent use of mobile phones for calling and for sending text messages after lights out: results from a prospective cohort study with a one-year follow-up. *Sleep*. 2007;**30**(9):1220-3.

[PubMed ID: 17910394]. [PubMed Central ID: PMC1978406]. https://doi.org/10.1093/sleep/30.9.1220.

3. Zhao TY, Zou SP, Knapp PE. Exposure to cell phone radiation up-regulates apoptosis genes in primary cultures of neurons and astrocytes. *Neurosci Lett*. 2007;**412**(1):34-8. [PubMed ID: 17187929]. [PubMed Central ID: PMC2713174]. https://doi.org/10.1016/j.neulet.2006.09.092.

4. Davis S, Smith BG, Rodrigue K, Pulvers K. An examination of Internet usage on two college campuses. *College Stud J*. 1999;**33**(2):257.

5. Lan-hua L, Li-ping Z, Zhao-Lan L. Impact of emotional intelligence on internet addiction disorder among students at a college in Weifang, 2009. *Preventive Med Tribune*. 2010;**9**(6):49-58.

6. Bahram Mirzayian, Fereshteh Baezzat, Naeimeh Khakpoor. [The Addiction among Students and Its Effect on Mental Health]. *Inform Commun Technol Educ Sci*. 2011;**5**(2):141-60. FA.

7. Billieux J, Van der Linden M, Rochat L. The role of impulsivity in actual and problematic use of the mobile phone. *Appl Cogn Psychol*. 2008;**22**(9):1195-210. https://doi.org/10.1002/acp.1429.

8. Yaseminejad P, Golmohammadian M, Yoosefi N. [The study of the relationship between cell-phone use and general heath in students]. *Knowl Res Appl Psychol*. 2012;**13**(1):60-72. FA.

9. Jenaro C, Flores N, Gómez-Vela M, González-Gil F, Caballo C. Problematic internet and cell-phone use: Psychological, behavioral, and health correlates. *Addic Res Theory*. 2009;**15**(3):309-20. https://doi.org/10.1080/16066350701350247.

10. Thomee S, Dellve L, Harenstam A, Hagberg M. Perceived connections between information and communication technology use and mental symptoms among young adults - a qualitative study. *BMC Public Health*. 2010;**10**:66. [PubMed ID: 20152023]. [PubMed Central ID: PMC2836296]. https://doi.org/10.1186/1471-2458-10-66.

11. Rotenberg KJ, MacDonald KJ, King EV. The relationship between loneliness and interpersonal trust during middle childhood. *J Genet Psychol*. 2004;**165**(3):233-49. [PubMed ID: 15382815]. https://doi.org/10.3200/GNTP.165.3.233-249.

12. Heinrich LM, Gullone E. The clinical significance of loneliness: a literature review. *Clin Psychol Rev*. 2006;**26**(6):695-718. [PubMed ID: 16952717]. https://doi.org/10.1016/j.cpr.2006.04.002.

13. Elhageen AAM. *Effect of interaction between parental treatment styles and peer relations in classroom on the feelings of loneliness among deaf children in Egyptian schools [Dissertation]*. Tübingen, Germany: University of Tübingen; 2004.

14. Alavi SS, Maracy MR, Jannatifard F, Eslami M. The effect of psychiatric symptoms on the internet addiction disorder in Isfahan's University students. *J Res Med Sci*. 2011;**16**(6):793-800. [PubMed ID: 22091309]. [PubMed Central ID: PMC3214398].

15. Motamednejad K. [UNESCO and the protection of children against Internet]. *Resaneh Journal*. 2002;**12**(2):28-33. FA.

16. Ferris JR. *Internet addiction disorder: Causes, symptoms, and consequences*. 2002. Available from: https://www.netaddictionrecovery.com/internet-addiction-disorder-causes-symptomsand-consequences/.

17. Alavi SS, Alaghemandan H, Maracy MR, Jannatifard F, Eslami M, Ferdosi M. Impact of addiction to internet on a number of psychiatric symptoms in students of isfahan universities, iran, 2010. *Int J Prev Med*. 2012;**3**(2):122-7. [PubMed ID: 22347609]. [PubMed Central ID: PMC3278877].

18. Jo H, Na E, Kim D. The relationship between smartphone addiction predisposition and impulsivity among Korean smartphone users. *Addic Res Theory*. 2017;**26**(1):77-84. https://doi.org/10.1080/16066359.2017.1312356.

19. Ashok SJ, Bhardwaj M. Mobile Phone Addiction and Loneliness among Teenagers. *Int J Indian Psychol*. 2015;**2**(3). https://doi.org/10.25215/0203.062.

20. Mansourian M, Solhi M, Adab Z, Latifi M. [Relationship between dependence to mobile phone with loneliness and social support in University students]. *Razi J Med Sci*. 2014;**21**(120):1-8. FA.

21. Jafari H, Aghaei A, Khatony A. The relationship between addiction to mobile phone and sense of loneliness among students of medical sciences in Kermanshah, Iran. *BMC Res Notes*. 2019;**12**(1):676. [PubMed ID: 31640804]. [PubMed Central ID: PMC6805567]. https://doi.org/10.1186/s13104-019-4728-8.

22. Yang S, Guan H, Tang Y, Wang H, Cao N. The Relationship between Daily Stress and Internet Addiction of Boys from the Higher Vocational College: The Regulating Role of Social Supports. *Lecture Notes Inform Technol*. 2012;**16**.

23. Naderi MA, Sajadian E. [Path analysis of relationship between personality traits and internet addiction with quality of life of internet users in Isfahan city]. *J Res Behav Sci*. 2010;**8**(1). FA.

24. Dargahi H, Razavi SM. [Internet addiction and its related factors: a study of an Iranian population]. *Payesh (Health Monitor) J*. 2007;**6**(3):0. FA.

25. Favaretto G, Morandin I, Gava M, Binotto F. [Internet and psychopathology: an analysis of the use of the Web by 1075 students at secondary school]. *Epidemiol Psichiatr Soc*. 2004;**13**(4):249-54. [PubMed ID: 15690895]. https://doi.org/10.1017/s1121189x00001767.

26. Chang MK, Man Law SP. Factor structure for Young's Internet Addiction Test: A confirmatory study. *Computers Hum Behav*. 2008;**24**(6):2597-619. https://doi.org/10.1016/j.chb.2008.03.001.

27. Alavi SS. [Psychometric properties of Young internet addiction test]. *Int J Behav Sci*. 2010;**4**(3):183-9. FA.