

## Investigating the Relationship between Smartphone Addiction and Loneliness and its Impact on Motivation to Progress in High School Students

Fatemeh Taghizadeh<sup>1</sup>, Parisa Reyhani<sup>2</sup>, Nader Molavi<sup>3</sup>, \*Masoudeh Babakhanian<sup>4</sup>, Masumeh Ghazanfarpour<sup>5</sup>, Firoozeh Mirzaee<sup>5</sup>, Zahra Abdollahi<sup>6</sup>, Aniseh Ahmadi<sup>7</sup>, Fahimeh Khorasani<sup>5</sup>

<sup>1</sup>Student Research Committee, Psychiatry and Behavioral Research Centre, Addiction Institute, Mazandaran University Of Medical Sciences, Sari, Mazandaran, Iran. <sup>2</sup>Sari Islamic Azad University and Office of Education of Sari, Tabarestan Counselling Center, Sari, Mazandaran, Iran. <sup>3</sup>Kashan University of Medical Sciences, Kashan, Iran. <sup>4</sup>Social Determinants of Health Research Center, Semnan University of Medical Sciences, Semnan, Iran. <sup>5</sup>Nursing Research Center, Kerman University of Medical Sciences, Kerman, Iran. <sup>6</sup>Department of Midwifery Education, Nasibeh Nursing and Midwifery Faculty, Mazandaran University of Medical Sciences, Sari, Mazandaran, Iran. <sup>7</sup>Islamic Azad Uniiran, Department of Psychology (Sari Branch), Sari, Mazandaran, Iran.

### Abstract

**Background:** Problematic use of new communication technologies, such as smartphone, declines social relationships and increases loneliness. The purpose of the study was to determine the relationship between smartphone addiction and loneliness, the motivation to progress and other relevant variables among high school students.

**Materials and Methods:** The present cross-sectional study was conducted in Sari, Iran, in 2016. Using stratified cluster random sampling, 348 high school girls and boys (first year of high school) were selected as the study sample. Informed consent, demographic information, Loneliness Scale-Version, motivation to progress questionnaire, and smartphone addiction scale (SAS) were obtained from all students at the baseline. Data were analyzed using SPSS software version 22.0.

**Results:** The study sample consisted 396 students, including 208 (52.2%) females. According to findings, Telegram application is widely used among the students. Parental educational level, loneliness and motivation to progress are negatively correlated to smartphone addiction. Additionally, factors such as the gender ( $p < 0.001$ ), the type of communication software (Telegram) ( $p = 0.04$ ), and the father's educational level ( $p = 0.04$ ) significantly predicted smartphone addiction among students.

**Conclusion:** The parental educational level especially father, gender of student, has a negative relationship with smartphone addiction, loneliness, and motivation to progress. Based on the results, the first year high school students are exposed to the risks and consequences of communication technologies. Therefore, it is imperative for Ministry of Education of Iran to consider the teaching programs about the proper usage of social network-related applications for students.

**Key Words:** Addiction, Loneliness, Motivation to progress, Social networks, Students.

\*Please cite this article as: Taghizadeh F, Reyhani P, Molavi N, Babakhanian M, Ghazanfarpour M, Mirzaee F, et al. Investigating the Relationship between Smartphone Addiction and Loneliness and its Impact on Motivation to Progress in High School Students. *Int J Pediatr* 2019; 7(10): 10187-193. DOI: [10.22038/ijp.2019.41716.3514](https://doi.org/10.22038/ijp.2019.41716.3514)

### \*Corresponding Author:

Masoudeh Babakhanian, Address: Social Determinants of Health Research Center, Semnan University of Medical Sciences, Semnan, Iran.

Email: [babakhanian.m@gmail.com](mailto:babakhanian.m@gmail.com)

Received date: Mar.16, 2019; Accepted date: Aug.12, 2019

## 1- INTRODUCTION

Following in the wake of communications technology revolution as well as heavy and extensive usage of social networks, in recent years, the extreme and pathological usage of the networks named as "Social Network Addiction" has been more attention. Dependency and addiction to the cell phones is defined as the frequent usage of cell phones to enter these networks and causes the mental engagement (1). The use of social networks is an integral part of today's life and many people find it impossible to stay away from them completely. However, in recent years, the addiction to cyberspace and social networks has also been addressed as with other essential and habitual behaviors, such as eating and having sex, which could be addictive (2). Researchers determined chemical and behavioral common addiction behaviors in seven dimensions, including obviousness, tolerance, mood changes, conflict, hangover, issues, and recurrence (3). The extensive usage of cell phones and new communication technologies, without any narcotics, is a compulsive disorder that reduces social relationships and increases social isolation and loneliness (4, 5).

According to findings on messaging, young people who excessively utilize cell phone indicate a high level of impulsiveness, loneliness and social anxiety (6). Smartphone addiction has become an acute social life problem, which has a negative impact on employment. The smartphone addiction causes feeling of depression, defeat, and loneliness, if the person is not able to access the cell phone. Moreover, their life and business is sometimes disturbed under the influence of frequent calls, text messages, web browsing and online chats. Studies demonstrate that students who extensively use cell phones have lower levels of self-confidence, higher level of

isolation, depression, sleep disorders and anxiety (7). Education system expresses more concern for high school due to development of independent identity in the students in comparison with elementary schools. The researchers conducted the current study to determine the relationship between smartphone addiction and loneliness, the motivation to progress and other relevant variables among high school students.

## 2- MATERIALS AND METHODS

### 2-1. Participants and study method

The samples of this cross-sectional study included all high school students in Sari, North of Iran in 2016. The method proposed by Krejcie and Morgan was used to calculate the sample size (n=348). Complex sampling (random, stratified and clustered) has been utilized for the selection of samples. In this respect, the samples were first selected among the high schools (first year high school [9<sup>th</sup> grade]) of the 2nd district of Sari, two girls' schools and two boys' schools. In the next phase, two classes were randomly selected, and then the girls and boys enrolled in the study based on random sampling method and sample size in each class, in case of having inclusion criteria. All high school students (first year high school [9<sup>th</sup> grade]) in Sari fit into the inclusion criteria and all of those who were reluctant to participate were excluded. Informed consent was obtained from all students at the baseline, and subsequently demographic information, loneliness scale, motivation to progress questionnaire, and smartphone addiction scale were used. The descriptive and inferential data were analyzed by SPSS software version 22.0 using mean and standard deviation (SD), Chi-square, Brown, Spearman and Fisher's coefficients. P-value less than 0.05 was considered as statistically significant level. Normal distributions were investigated using Kolmogorov-Smirnov test.

## 2-2. Measurement Tools

### 2-2-1. UCLA Loneliness Scale-Version 3

This questionnaire was first constructed by Russell and Ferguson in 1980 as a 20-point self-report scale. The questionnaire uses a 4-point Likert scale from 1 (never) to 4 (always) to measure dissatisfaction of individuals from social relationships in two dimensions: the lack of intimate relationships and the lack of social network. The questions 1, 5, 6, 9, 10, 15, 16, 19, 20 have reverse scores. Thus, the range of scores obtained on this scale is between 20 and 80. The mean score is 50. The score greater than the mean score indicates greater loneliness. Russell et al. (1980) reported an internal consistency of 0.94 (8). In the research of Ghasemzadeh (2006), according to Davarpanah (1994), the coefficient of internal consistency was 0.78 (9).

**2-2-2. Motivation to Progress Questionnaire:** Hermans in 1970 constructed the questionnaire (10) in which there were 29 multiple-choice questions (MCQ). Hermans calculated the reliability of the original form by Cronbach's alpha and test-retest (0.82 and 0.85, respectively). Excluding eight questions, the reliability of the questionnaire was reported to be 0.83 in the Persian version of this tool, administered for a group of students in Saveh city, Iran (11).

**2-3. The Smartphone Addiction Scale (SAS):** In the smartphone addiction (dependency) questionnaire was created by Hyun Yong Koo in 2009 (12), and consists of 20 questions, the first part is demographic characteristics and proper cell phone usage methods. The second part includes questions about cell phone, resistance to the three domains of deprivation, functional disorder, and compulsion and each component has specific questions as follows: deprivation (questions 1 to 7), life disorder (questions

8 to 13) and compulsion (questions 14 to 20). Likert scale was the base of the scoring. The scale was divided to four groups, including very low, low, high and very high and varied from 1 to 4. The scores below 63 represent the moderate usage of cell phones. Heavy cell phone users get the scores between 63 and 69. The students who have score equal to or greater than 70 are considered addicted. Savari and Manshedavi localized the Persian version of this tool in which the reliability of the questionnaire has been reported about 92% using the Cronbach's alpha coefficient, and the validity of the questionnaire was confirmed after translating and using factor analysis by academic professors (13).

## 3- RESULTS

The sample size of the study was 396 containing 188 males (47.5%) and 208 females (52.5%). Table.1 shows the distribution of the educational level and the type of courses as well as information about the parental education of the subjects. Cell phone usage was reported an hour per day. Table.2 shows the data relating the accessibility of users to the smartphones in using social networks. According to the table, the telegram application is highly utilized among users. According to the results, parental educational level has a significant and negative relationship with smartphone addiction ( $r=-0.207$ ), loneliness ( $r=-0.228$ ), and motivation to progress ( $r=-0.360$ ) (Table.3). Moreover, loneliness and motivation to progress have a negative relationship. The educational level and the methods of the social network (Telegram) usage ( $r=0.201$ ) build up a significant and direct relationship. As seen in Table.4, variable predictors of smartphone addiction among students are the gender, parental educational level and the type of software used in the cell phone (Telegram).

**Table-1:** Baseline characteristics of the participants.

Variables		Total	Frequency (Percentage)	
Gender	Female	396	208(52.05%)	
	Male		188(47.5%)	
Type of educational institution	High school	396	248(62.6%)	
	Vocational school		148(37.4%)	
Educational grades	2 <sup>nd</sup> grade of high school	396	193(48.7%)	
	3 <sup>rd</sup> grade of high school		171(43.2%)	
	4 <sup>th</sup> grade of high school		32(8.1%)	
Parental educational level	Primary school	396	Father	10(2.5%)
			Mother	0
	Secondary school		Father	44(11.1%)
			Mother	80(20.2%)
	High school		Father	86(21.7%)
			Mother	154(38.9%)
	Academic		Father	256(64.6%)
			Mother	162(40.9%)

**Table-2:** Contribution of students in using smartphones' applications.

Communication and game applications	Total	Percentage
Telegram	274	(80.5%)
Instagram	161	(47.3%)
Line	26	(7.7%)
Emo	20	2 (5.6%)
Viber	12	(3.6%)
Video games	170	(44.3%)
Online games	105	(30.1%)

**Table-3:** Pearson correlation matrix variables between demographic profile, smartphone addiction, motivation to progress and loneliness.

Variables	Smartphone addiction	Feeling of loneliness	Motivation to progress	Gender	Maternal educational level	Paternal educational level	Communication applications (Telegram)	Communication applications (Instagram)	Educational level
Smartphone addiction	1								
Feeling of loneliness	<sup>e</sup> 0.049	1							
Motivation to progress	<sup>e</sup> 0.041	<sup>e</sup> -0.0182	1						
Gender	<sup>c</sup> 0.080	<sup>c</sup> 0.052	<sup>c</sup> 0.080	1					
Maternal educational level	<sup>e</sup> -0.269	<sup>e</sup> -0.331	<sup>e</sup> -0.162		1				
Paternal educational level	<sup>e</sup> -0.207	<sup>e</sup> -0.228	<sup>e</sup> -0.360			1			
Communication application (Telegram)	<sup>c</sup> 0.332	<sup>c</sup> 0.101	<sup>c</sup> 0.453	<sup>a</sup> 0.053	<sup>b</sup> 0.183	<sup>b</sup> 0.180	1		
Educational level	<sup>e</sup> -0.002	<sup>e</sup> -0.209	<sup>e</sup> -0.048	<sup>b</sup> 0.032	-	-	<sup>b</sup> 0.201	<sup>b</sup> 0.097	1

The correlation coefficients in the underlined cases are significant. <sup>a</sup> Cramer's V Correlation, <sup>b</sup> Coefficient of agreement, <sup>c</sup> Correlation Coefficient of 1 to  $\eta^2$ , <sup>d</sup> Spearman Correlation Coefficient, <sup>e</sup> Pearson Correlation Coefficient.

**Table-4:** Impact coefficients, beta and t values of predicting smartphone addiction among high school students

Variable criteria	R <sup>2</sup>	Variable predictor	Standard beta value	t value	Significance level
Smartphone addiction	0.229	Fix value	---	1.841	0.068
		Motivation to progress	-0.085	-0.571	0.569
		Loneliness	-0.113	-1.187	0.237
		Gender	0.349	4.241	0.000
		Maternal educational level	0.196-	1.635	0.105
		Paternal educational level	0.186	-2.043	0.043
		Communication application (Telegram)	0.223	2.031	0.044
		Educational level	-0.129	-1.387	0.168

#### 4- DISCUSSION

Obsessive-compulsive internet usage follows the lack of motivation to progress and loneliness. In this study aimed at investigating the relationship between smartphone addiction and loneliness and its impact on motivation to progress among high school students, the results expressed a high rate of different social network application usage among students among which Telegram is in the first place. Valid results of the study also confirm the negative relationships of parental educational level and smartphone addiction, loneliness and motivation to progress. Currently, the growth of smartphone addiction is significant among Iranian teenagers, the most important reason of which is the social and cultural status in Iranian society (14). The findings of the present study express the impact of multilevel risk factors on heavy student usage of the cell phone, one of which is "paternal educational level", which has a significant correlation with "smartphone addiction". According to the results of similar studies in Iran, low paternal educational level has a direct correlation with student's smartphone addiction, so that they feel high level of loneliness in comparison with their peers at school (15). Serious factors of addiction to the Internet are family processes and functions. According to one of the new findings of our study, the parental educational level builds up a negative relationship with smartphone addiction in an individual

student. The results of similar studies also confirm that the parents with higher educational level would lead their children to the proper usage of the Internet and efficiently monitor the usage of children on the internet (16). Additionally, we predicted several variables regarding the students' tendency for internet addiction. Gender is one of these patterns. Although women display more tendency toward behavioral symptoms of smartphone addiction and social interactions (17) with the purpose of keeping in contact with real friends, the men in cyberspace search for new friends, learning and developing their social identity and using online games (18). Teens have motivations to progress which is constant till students' psychological needs in school and the opportunities provided in the school do not interfere with each other (19). Although use of new communication software in schools partly contribute to the students' learning process, it has some consequences such as fatigue, depression, impatience, academic failure, lessening performance of the individual, and finally loss of the students' motivation to progress (20-22). Nowadays, due to the fact that many students, without any external interfering factors, feel loneliness, which can bring out emotional issues, assessment and promotion of mental health in students play a significant role (23, 24). Following the emotional issues, the student faces other problems: low self-confidence in school leads the person to behavioral

addictions such as smartphone addiction, the new branch of this area (15). Among high school students, the internet addiction is an extensive new health problem that has a significant relationship between loneliness and internet addiction (25). Nevertheless, some studies have shown that social networks reduce feelings of loneliness in adolescents. Facilitating chat and talking processes, catching up the news, accessing other applications and facilities like the camera; having online and offline communications with relatives and friends helps to reduce the feelings of loneliness, and make the person popular among all age groups, in line with the findings of our study (26-28). According to the findings of this study, Telegram is the most usable social network. A similar study (2018) reported that the high school students in Golestan province mainly utilize Telegram application (29), since this application has been effectively designed so that it paves the way for communication through information set on user's profile (such as images, personal information, interests, and biographies of individuals).

#### 4-1. Study Limitations

The current study has some limitations, the most important of which are: 1. Because of the correlational design of the study, there was no possibility of controlling the confounding variables, and these variables might be effective on how students respond. 2. Since the study has been carried out on a limited sample of students and only in a specific city, hence, the results should be generalized with caution.

#### 5- CONCLUSION

The internet overuse is associated with criteria such as lack of motivation to progress and loneliness. The purpose of the study was to investigate the relationship between smartphone addiction and loneliness and its impact on the motivation to progress among high school

students. The results of this study indicate that the Telegram application is the most used among students, and that the parental educational level has a negative relationship with smartphone addiction, loneliness, and motivation to progress. Predictor variables of smartphone addiction among students are the gender, the type of software and parental educational level. According to the results of the study, students are exposed to the risks and complications of this technology. Therefore, the Ministry of Education of Iran should consider programs to develop the culture about the proper use of cyberspace network applications for students across the country.

**6- CONFLICT OF INTEREST:** None.

#### 7- REFERENCES

1. Takao M. Takahashi S. Kitamura M. Addictive personality and problematic mobile phone use *Cyberpsychol Behav* 2009; 12(5):501-7.
2. Grant JE, Potenza MN, Weinstein A, Gorelick DA. Introduction to Behavioral Addictions. *Am J Drug Alcohol Abuse* [Internet]. 2010;36(5):233–41.
3. Andreassen C, Pallesen S. Social Network Site Addiction - An Overview. *Curr Pharm Des* [Internet]. 2014 ; 20(25):4053–61.
4. Billieux J. Van der Linden M. Rochat L. The role of impulsivity in actual and problematic use of the mobile phone. *Applied Cognitive Psychology*.2008; 22(9), 1195-1210.
5. Swendsen J. Contributions of mobile technologies to addiction research. *Dialogues Clin Neurosci*. 2016; 18(2):213-21.
6. Mansourian M. Solhi M. Adab Z. Latifi M. Relationship between dependence to mobile phone with loneliness and social support in University students. *RJMS*. 2014; 21 (120):1-8
7. Beranuy M. Oberst U. Carbonell X. Chamarro A. Problematic Internet and mobile phone use and clinical symptoms in college students: The role of emotional intelligence. *Computers in human behavior*.2009; 25(5), 1182-87.

8. Russell D, Peplau LA, Cutrona CE. The revised UCLA Loneliness Scale: concurrent and discriminant validity evidence. *J Pers Soc Psychol.* 1980; 39(3):472-80.
9. Ghasemzadeh L. Pathology of loneliness, self-esteem and social skills of students with and without use of the Internet. 2007. [Thesis].
10. Hermans, H. J. A questionnaire measure of achievement motivation. *Journal of Applied Psychology* 1970; 54: 353-63.
11. Heidarali H, Asgari A. Preparation and standardization the test of motivation for progress. *Psychological Research* 2001; 6 (1, 2): 9-33.
12. Koo HY. Development of a cell phone addictive Scale for Korean Adolescents. *J Korean Acad Nurs.* 2009; 39 (6): 818-28.
13. Sevari K, Manshedavi S. The Efficacy of Self-awareness Training on Reduction of Internet Addiction and Loneliness and Increase of Self-efficacy. *Quarterly Clinical Psychology Studies.* 2016; 22; 163-79.
14. Hashemian A, Direkvand-Moghadam A, Delpisheh A, Direkvand-Moghadam A, Kolivand Z, Abasi M. Prevalence of Internet addiction in Iranian high school students; a cross-sectional study. *International Journal of Epidemiologic Research,* 2014; 1(1): 9-15.
15. Parashkouh NN, Mirhadian L, EmamiSigaroudi A, Leili EK, Karimi H. Addiction to the Internet and mobile phones and its relationship with loneliness in Iranian adolescents. *Int J Adolesc Med Health.* 2018 Dec 4. pii: /j/ijamh.ahead-of-print/ijamh-2018-0035/ijamh-2018-0035.xml.
16. Heo J, Oh J, Subramanian S, Kim Y, Kawachi I. Addictive internet use among Korean adolescents: a national survey. *PLoS One.* 2014;9(2):e87819.
17. Andreassen CS, Torsheim T, Brunborg GS, Pallesen S. Development of a Facebook addiction scale. *Psychological reports.* 2012;110(2):501-17.
18. Hawkins M. South Korea introduces yet another law to curb gaming's ills. *NBC News.* 2012.
19. Yu C, Li X, Zhang W. Predicting adolescent problematic online game use from teacher autonomy support, basic psychological needs satisfaction, and school engagement: A 2-year longitudinal study. *Cyberpsychology, Behavior, and Social Networking.* 2015;18(4):228-33.
20. Yuan K, Qin W, Liu Y, Tian J. Internet addiction: Neuroimaging findings. *Communicative and integrative biology.* 2011;4(6):637-9.
21. Thomson L, Dawson K, Ferdig R, Black EW, Bayer J, Coutts J. The Intersection of online social networking with Medical professionalism. *J Gen Inter Med.* 2008; 23(7):954-7.
22. Shahghasemy A. Review on effect of virtual space field on communication theories. *Global Media Journal.* 2006; 2(2):31-7.
23. Sadeghian E, Kosha MM, Gorji S. The study of mental health status in high school female students in hamadan city. *Scientific Journal of Hamadan University of Medical Sciences.* 2010;17(3):39-45.
24. Salimia A, Jowkar B. Personality predispositions and loneliness in adolescence. *Procedia-Social and Behavioral Sciences.* 2011;29:296-9.
25. Koyuncu T, Unsal A, Arslantas D. Assessment of internet addiction and loneliness in secondary and high school students. *J Pak Med Assoc.* 2014;64(9):998-1002.
26. Mohammadi S, Valinejadi A, Saman JA, Karimpour H, Kaivanfar M, Safaiepour M, et al. Assessment of addiction to internet, smartphone and social networks among students of medical sciences: a cross sectional study. *Electronic Journal of General Medicine.* 2018; 15(4):em35.
27. Ogata Y, Izumi Y, Kitaike T. Mobile-phone e-mail use, social networks, and loneliness among Japanese high school students. *Japanese Journal of Public Health.* 2006; 53: 480-92. PMID: 16944832.
28. Kousari M, Javadi Yegane MR, Kheuikhah T. The uses of mobile phone among the Iranian users: applying the uses and gratification theory. *Cultural studies andCommunication.* 2007; 2(7):205-26.
29. Salehi Omran E, Abedini baltork M, Azizi Shomami M, Keshavarz K. Relationship between Internet Addiction and Depression among Secondary School Students in Kordkuy, Iran, with an Emphasis on the Type of Virtual Network. *J Educ Community Health.* 2018; 5 (1): 13-18. (Persian)