Research Paper:
Relationship Between Girls' Internet Addiction and Their Mothers' Psychological and Spiritual Health

Zahra Ahmadi[1], Mina Jafarizadeh[1*] , Hamid Haghani[2]

1. Department of Community Health Nursing, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran.
2. Department of Statistics, School of Public Health, Iran University of Medical Sciences, Tehran, Iran.

ABSTRACT

Background: Although the internet has prevailed in every aspect of our life, it can be addictive, especially for the adolescents. This study aimed to investigate the relationship between internet addiction in female school students and their mothers' mental health and spiritual wellbeing.

Methods: This is a descriptive correlational study conducted on 400 senior high school female students and their mothers. The study sample was selected using a multi-stage cluster sampling method. Data was collected by a demographic survey form, Persian version of Internet Addiction Test (IAT), General Health Questionnaire (GHQ), and Spiritual Well Being Questionnaire (SWBQ) and was analyzed by descriptive and inferential (ANOVA, t-test, and linear regression analysis) statistics using SPSS-PC V. 20.

Results: About 86% of the students were normal internet users. Around 36.8% of the mothers had mild mental health problems, and 94.3% had high spiritual wellbeing. There was a significant negative relationship between internet addiction and spiritual wellbeing and its two dimensions (religious and existential wellbeing) (r=-0.454, P<0.001). The internet addiction had a significant positive relationship with the mothers' mental health (r=0.341, P<0.001).

Conclusion: Studying the problem of internet addiction among female students and paying attention to the mental health and spiritual wellbeing of families, especially mothers, in order to improve their health status seems necessary. Hence, authorities should develop appropriate strategies in this area.

* Corresponding Author:
Mina Jafarizadeh, MSc.
Address: Department of Community Health Nursing, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran.
Tel: +98 (914) 7449295
E-mail: jafarizadeh93@gmail.com

Highlights

● Internet addiction in female students had a significant negative relationship with spiritual wellbeing in their mothers.

● The Internet addiction in female students had a significant positive relationship with mental health and its subscales in mothers.

● The higher level of mental health and spiritual well-being in parents, especially mothers, can reduce the effects of inappropriate use of the Internet and Internet addiction in their children.

Plain Language Summary

Considering the rising trend of Internet use in Iran, especially among adolescents and youth, studying the factors that contribute to Internet addiction of particular importance. Because no research has already been conducted on the Internet addiction female students in Iran, we attempted to investigate the association between the Internet addiction in female children and the mental health and spiritual wellbeing of their mothers.

1. Background

Internet has become an essential part of the everyday life of people and a powerful tool for recording and disseminating information around the world (Liu & Luo 2015; Shek & Yu 2016). By using it, people have more flexibility and comfort in their personal communication, leisure and entertainment, information search, and their time-consuming tasks (Shek & Yu 2016). The numbers of internet users have been increased because of achieving the numerous opportunities and satisfaction by its use and also individuals' strong attachment to it (Jamshidi & Sarvghad 2008; Patrick & Joyce 2008).

The number of Internet users has increased around the world almost tenfold from 1990 to 2013 (Shek & Yu 2016). It is estimated that 3 billion people have been the user of Internet in 2014, (Liu & Luo 2015), of them 26.5% were aged 15-24 years (Shek & Yu 2016). Despite the high advantages and benefits of the Internet, its extensive use may lead to physical, psychological, and social problems and addiction (Şaşmaz et al. 2013), where adolescents are among the most vulnerable groups (Xu et al. 2012).

Internet addiction, as a disorder, was introduced by Evan Goldberg, a New York psychiatrist, in 1995. Then Young introduced its diagnostic and statistical criteria in 1996 (Sung et al. 2013). According to the recent studies, the prevalence of internet addiction has been reported between 0.3% and 38% (Shek & Yu 2016) and has been considered as a serious public health problem world-wide (Tang et al. 2014), particularly in developing countries (Xu et al. 2012).

The Internet behaviors should be taken seriously. Internet addiction in young people does not develop in society, but in the family and relationships with parents are the main predictors of individuals' Internet addiction. Good relationships between parents and children reduces the tendency towards using the Internet and, hence, Internet addiction (Wąsiński & Tomczyk 2015). Mental health of the family also plays an important role in this area. Therefore, the role of parents and their mental health should be taken into account in the study of people with Internet addiction (Lam 2015).

The mental health of parents affects children's mental health and children's behavioral disorders are closely related to the mental problems of their parents; when parents, especially mothers, lack proper mental health, children are more likely to develop behavioral and emotional problems (Ahmadi 2013; Sanders 2002). There is also a significant positive relationship between mental health and spiritual wellbeing, and spiritual wellbeing is one of the most important socio-cultural factors associated with mental health (Vafaee 2015). Parents' mental and spiritual wellbeing are two important and effective factors in the development of children's mental health and spiritual wellbeing (Ahmadi 2013).

On one hand, school students are more likely to be in the family environment than college students, and are more vulnerable to the Internet addiction (Enasroodi et al. 2014); on the other hand, the most sensitive periods

of a person's life are spent at home and next to mother (Saeedi 2010). The relationship of children, particularly daughters, in the family is more intimate with their mothers; therefore, mothers have more influence on the thoughts, moral values, and behavior of their children (Shirazi et al. 2014).

Community health nurses are on the front line of dealing with illnesses and disorders, and their working environment include houses, schools, factories, health and medical institutions, and hospitals. Since students and adolescents are at higher risk of Internet addiction, community health nurses in health centers and schools can play their role as advisors and researchers to screen health problems and provide health care to students and staff, and building bridges between teachers, families and the community. They can identify this disorder in adolescents at an early stage and take the necessary steps for its treatment (Ildarabadi & Eshaghi 2016; Meshkat Sadat 2014).

Considering the rising trend of the Internet use in Iran, especially among adolescents and youth, and the Internet addiction as the most devastating outcome of its extensive use (Bahri et al. 2011; Turi et al. 2015), studying the factors that contribute to its creation or intensification is of particular importance (Fereidouni 2013). Moreover, no research was found on the frequency of Internet addiction in daughters and its relationship with mental and spiritual wellbeing of mothers. Thus, this study aimed to investigate the association between Internet addiction in female students and mothers' mental health and spiritual wellbeing.

2. Materials and Methods

This is a descriptive, cross-sectional study that was conducted in 2016. The study samples were 400 senior high school female students (from public schools in Ardebil City, Iran) and their mothers. The sample size was estimated at a confidence level of 95% and an accuracy of 0.05. For sampling, a multi-stage cluster sampling method was used.

After obtaining approval from the Research Ethics Committee of Iran University of Medical Sciences and receiving permission from the university and school officials, the researchers collected information from the students and their mothers after obtaining their informed consent by explaining the study objectives and assuring them of the confidentiality of the information. The data collection tools were a demographic survey form, Persian versions of Internet Addiction Test (IAT), General

Health Questionnaire (GHQ), and Spiritual Well Being Questionnaire (SWQ).

IAT was designed by Kimberly Young in 1998. It has 20 self-report items measuring the presence of addiction to the Internet in people and rated based on a 5-point Likert-type scale. It groups the Internet users into three categories including normal users, at-risk users, and addicted users (Sally 2006; Widyanto & McMurran 2004). GHQ was designed by Goldberg and Hiller in 1979 for screening the patients' mental health. It has 28 items and four subscales (each with 7 items) rated based on a 4-point Likert-type scale scored from 0 to 3. Its total score ranges from 0 to 84.

Lower scores show better mental health and higher scores indicate lower mental health. It categorizes mental health into four levels including low/no disturbance, mild, moderate, and severe. It takes almost 8 minutes to examine the symptoms and state of mental health in a person in his/her last month (one month before examination) (Rostami et al. 2013; Hamid Babamiri & Dehghani 2012; Molina et al. 2006). Finally, the SWQ designed by Paloutzian and Ellison in 1982, measures spiritual wellbeing under two subscales of religious (10 items with odd numbers) and existential (10 items with even numbers) wellbeing.

The questions are scored based on a 6-point Likert-type scale ranging from "completely disagree" to "completely agree". The higher the score, the better the spiritual welbeing. In this regard, the scores are divided into three levels of low, moderate, and high (Abbasi et al. 2012; Allahbakhshian et al. 2010; Taliaferro et al. 2009). Since the validity of these questionnaires has been already examined and verified, we did not test their validity. For examining their reliability, the internal consistency of items and the Cronbach α coefficients were evaluated. In this regard, they were completed by a group of samples (n=20).

The Cronbach α of 0.88 has been reported in previous studies for the Persian version of IAT (Soltani, Fooladvand & Fathi 2010; Shayegh, Azad & Bahrami 2009). In our study, it was obtained as 0.92. Vafaee (2015) reported α=0.94 for the Persian version of GHQ, while in our study it was obtained as 0.82. Finally, for the Persian version of SWQ, a Cronbach α of 0.82 was reported by Allahbakhshian et al. (2010) and Unterrainer et al. (2010), while Vafaee (2015) reported it as 0.89. In our study, it was obtained as 0.84.

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The collected data were analyzed in SPSS-PC V. 20 using descriptive (frequency, percentage, mean, and standard deviation) and inferential (ANOVA, t-test and linear regression analysis) statistics.

3. Results

Table 1 presents the frequency of Internet addiction among the sample. The Table 1 shows that 86% of the students were normal Internet users, while 13.3% were at risk for the internet addiction and 0.8% was already addicted to it. Table 2 shows statistics of Internet addiction in the sample based on demographic characteristics. According to the results, the Internet addiction had a significant relationship with the students' age (P=0.048), students' field of study (P=0.016), amount of time spent on the Internet (P=0.001), mother's education (P=0.001), and economic status (P=0.001). The Internet addiction level was higher in students with higher level of economic status (P=0.024).

Results of the multiple linear regression analysis (Table 3) showed that the time spent on the Internet (P<0.001) was significant in the model. The beta coefficient was 4.145. This indicates that, as the time of the Internet use increases by an hour, the Internet addiction is increases by 4.145 units. The children of the mothers with primary school, middle school, and high school education respectively had internet addiction of 7.619, 5.137, and 5.788 units less than the children of mothers with a bachelor or higher degrees.

The frequency of mental health among the mothers of the students is shown in Table 4. The Table 4 shows that 36.5% of them had no problem with their mental health, while 36.8% were at mild level. Their mean of total mental health was 30.03. Table 5 presents the frequency of mothers' spiritual wellbeing. According to the results, 94.3% had high spiritual wellbeing, and 5.5% of them were at moderate level. The mean score of religious dimension was 52.11 and it was 46.04 for the existential dimension. In total, the mean score of the mothers' spiritual wellbeing was 98.15 (Table 6).

Table 1. The frequency of internet addiction among the female students

The Internet Addiction	No.	%
Normal user (20 - 49)	344	86
At-risk user (50 - 79)	53	13.3
Addicted user (80 - 100)	3	0.8
Mean ± SD	34.3 ± 14.86	

Table 2. Numerical indicators of internet addiction among the female students according to their demographic characteristics

Characteristics		No.	Mean $\pm$ SD	Test Results
Student's age, y	15	72	35.91 ± 16.27	F = 2.657*
	16	129	31.28 ± 11.66	
	17	96	35.48 ± 14.32	P = 0.048
	18	103	35.84 ± 17.36	
Student's field of study	Mathematics	143	36.82 ± 15.85	F = 4.169*
	Experimental sciences	115	31.52 ± 14.13	
	Human sciences	142	34.01 ± 14.06	P = 0.016
Student's grade	10th	136	33.31 ± 14.67	F = 0.488*
	3rd (old system)	146	35.02 ± 15.3	
	4th (new system)	118	34.53 ± 14.59	P = 0.614

Characteristics		No.	Mean ± SD	Test Results
Number of siblings	0	24	34.5 ± 15.03	F = 1.635*
	1	159	33.03 ± 13.56	
	2	126	33.74 ± 14.63	P = 0.181
	3 and more	91	37.23 ± 17.0	
Time spent on the internet, h	< 1	185	25.97 ± 7.45	F = 106.66*
	1 - 2	80	33.78 ± 9.82	
	2 - 4	62	37.62 ± 12.59	P < 0.001
	> 4	73	53.13 ± 17.18	
Mother's age, y	< 34	43	33.54 ± 14.55	
	35 - 39	141	32.56 ± 14.29	F = 2.156*
	40 - 44	123	34.34 ± 15.24	
	45 - 49	74	38.55 ± 15.83	P = 0.073
	> 50	19	32.1 ± 10.87	
Mother's education	Primary school	116	31.54 ± 11.83	F = 5.414*
	Middle School	117	37.02 ± 16.73	
	High school	124	32.41 ± 13.16	P = 0.001
	Bachelor or higher	43	39.76 ± 18.76	
Mother's occupation	Housekeeper	353	33.83 ± 14.36	t = 1.943; df = 394**
	Employed	43	38.49 ± 18.51	P = 0.053
Father's age, y	< 40	28	32.04 ± 14.93	
	40 - 44	142	33.47 ± 15.14	F = 2.151*
	45 - 49	122	33.28 ± 14.22	
	50 - 54	76	38.72 ± 15.79	P = 0.074
	> 55	32	33.3 ± 12.43	
Father's education	Primary school	79	32.59 ± 11.72	F = 2.449*
	Middle School	99	31.68 ± 13.58	
	High school	151	36.07 ± 15.87	P = 0.063
	Bachelor or higher	71	36.07 ± 16.89	
Father's job	Unemployed	12	36.33 ± 14.33	
	Self-employed	251	33.98 ± 14.36	F = 1.419*
	Employed	82	36.14 ± 16.47	
	Worker	29	29.1 ± 9.99	P = 0.227
	Retired	26	36.38 ± 18.23	
Economic situation	Low	28	28.8 ± 12.71	F = 3.759*
	Fair	352	34.37 ± 14.46	
	High	20	40.65 ± 21.45	P = 0.023

* ANOVA; ** t-test

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Table 3. The linear regression analysis results for examining the effect of demographic factors on the Internet addiction

Independent Variables		β	Standardized Coefficient	t	Sig.	R²
	Student's age	-0.350	-0.025	-0.698	0.485	0.518
	Time spent on the internet	4.145	0.695	18.975	< 0.001	0.518
Student's field of study	Human Sciences		Ref.			0.518
	Mathematics	1.623	0.052	1.271	0.204	
	Experimental sciences	0.039	0.001	0.028	0.978	
Mother's education	Bachelor or higher		Ref.			0.518
	Primary school	-7.619	-0.233	-3.93	0.001	
	Middle School	-5.137	-0.157	-2.691	0.007	
	High school	-5.788	-0.180	-3.073	0.002	
Economic situation	High		Ref.			0.518
	Low	-0.305	-0.005	-0.096	0.924	
	Fair	1.196	0.026	0.476	0.635	

Table 4. The frequency of mental health among the mothers

Mental Health	No.	%
No problem (0 - 22)	146	36.5
Mild (23 - 40)	147	36.8
Moderate (41 - 60)	98	24.5
Severe (61 - 84)	9	2.2
Mean ± SD	30.03 ± 15.27	

According to Table 7, there was a significant negative association between the students' Internet addiction and their mothers' spiritual wellbeing and also its two dimensions (r=-0.454, P<0.001). That is, the lower the mothers' spiritual wellbeing, the higher the Internet addiction of the students. Moreover, there was a significant positive relationship between the students' Internet addiction and the mental health of their mothers (r=0.341, P<0.001). Since the high scores of mental health and its subscales indicate poor mental health state, it can be said that with

Table 5. The frequency of spiritual wellbeing among the mothers

Spiritual Wellbeing	No.	%
Low (20 - 40)	1	0.2
Moderate (41 - 99)	22	5.5
High (100 - 120)	377	94.3
Total	400	100

Table 6. The Mean ± SD of spiritual wellbeing dimensions among the mothers

Spiritual Wellbeing	Min	Max	Mean ± SD
Religious (10 - 60)	22	60	52.11 ± 7.59
Existential (10 - 60)	16	60	46.04 ± 9.29
Total	38	120	98.15 ± 15.63

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mothers' mental health deterioration, the female students' Internet addiction increases and vice versa.

4. Discussion

In the current study, 86% of the female students were normal Internet users that is consistent with the results of Seyrek et al. (2017); Munno et al. (2017); Hamidi, Mahdiyeh Najafabadi & Namazian Najafabadi (2015); and Rouhani & Tari (2011). However, it is contrary to the findings of Chen et al. (2016) who reported an Internet addiction of 8.7% among Chinese adolescents, and Li et al. (2014) who found that middle school students' Internet addiction in China was 21.13%. This discrepancy could be associated with differences in culture, the questionnaires, and study sample. The religiosity of people in Ardabil Province can also be another factor. Hence, it is likely that the religiosity of families and students can prevent their extensive use of the Internet.

In our study, 36.5% of the mothers had no mental health problems. The mean score of total mental health in mothers was 30.03. This is congruent with the results of Tavakoli (2014) and Bahri et al. (2011), but inconsis-

tent with the findings of Yektakhah, Allameh & Ghorji (2014) who studied general health and quality of life of mothers with autistic children. They reported a mean total general health score of 54.5 for mothers. The reason for this inconsistency may be related to differences in study samples. In their study, children had autism; therefore, the mothers of these children might have experienced lower levels of general health due to their children's disease.

In a study in China, Lam (2015) reported mild depression and anxiety of parents that is congruent with our results. de Kock, Görgens-Ekermans & Dhladhla (2014) used GHQ-25 to evaluate general psychological health of black South African samples. The mean psychological health reported by them was consistent with our results. Thorgaard et al. (2017) studied the effects of health anxiety in mothers on children's health complaints. They reported lower levels of mothers' psychological health compared to that reported in our study which can be related to the use of different tools and study population.

According to the results of this study, mothers had high spiritual wellbeing which is consistent with the findings

Table 7. Correlation between students' internet addiction and mothers' mental health and spiritual wellbeing

Variable	Somatic Symptoms	Anxiety/ Insomnia	Social Function	Severe Depression	Mental Health	Internet Addiction
Religious wellbeing	r = -0.280	r = -0.389	r = -0.406	r = -0.483	r = -0.482	r = -0.421
	P = 0.001	P < 0.001	P < 0.001	P < 0.001	P = 0.001	P = 0.001
Existential wellbeing	r = -0.400	r = -0.531	r = -0.525	r = -0.643	r = -0.650	r = -0.419
	P < 0.001	P = 0.023	P = 0.001	P = 0.023	P < 0.001	P < 0.001
Spiritual wellbeing	r = -0.374	r = -0.505	r = -0.509	r = -0.617	r = -0.621	r = -0.454
	P < 0.001	P < 0.001	P = 0.001	P < 0.001	P < 0.001	P < 0.001
Internet addiction	r = 0.207	r = 0.343	r = 0.170	r = 0.343	r = 0.341	
	P < 0.001	P < 0.001	P = 0.001	P < 0.001	P < 0.001	

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of Kadivar et al. (2015) and Hosseini et al. (2014). Mostafazadeh & Asadzadeh (2012), as well as Aghahosini et al. (2011), reported a rate of 73.65% and 75.30% for spiritual wellbeing respectively which are lower than our results. This may be associated to the difference in sample size and study population (patients, both males and females).

No similar study was found about the Internet addiction of school girls and mental health and spiritual wellbeing of their mothers in the literature. This can be considered as a strong point of our study. Martinez & Custodio (2014) in their study, found a significant association between mental health and spiritual wellbeing, and spiritual wellbeing was the strongest predictor of mental health. In other words, poor mental health is associated with lower spiritual wellbeing. Vafaee (2015) also reported similar results.

Lam (2015) in studying parental mental health and Internet addiction in Chinese adolescents, reported a significant relationship between parental mental health, especially after depression, and Internet addiction of their children. Khosravie & Alizadeh Sahraie (2011) studied the relationship between Internet addiction and family functioning and mental health in Iranian students and found that family's emphasis on religious issues had a significant and negative relationship with children's Internet addiction. These findings are consistent with our results.

The current study revealed that Internet addiction in students had a significant negative correlation with spiritual wellbeing of their mothers and its two dimensions. That is, with the lower spiritual wellbeing in mothers, the Internet addiction of school girls increases. Furthermore, the Internet addiction in students had a significant positive relationship with mental health of mothers. Since the high scores of mental health and its subscales indicate poor mental health state, it can be said that with mothers' mental health deterioration, the Internet addiction in school girls increases and vice versa.

This study suggests paying more attention to the effect of spiritual and psychological wellbeing of mothers on the Internet addiction of female students. By increasing the parents' (especially mothers) level of mental health and spiritual wellbeing, the effects of inappropriate use of the Internet and Internet addiction in children can be reduced.

Ethical Considerations

Compliance with ethical guidelines

This study has been approved by the Research Ethics Committee of Iran University of Medical Sciences (IUMS). Before collecting data, an introductory letter was obtained from the IUMS and presented to Ardabil University of Medical Sciences and the research goals were explained to them. Moreover, written consent was obtained from participants. They were informed that they were free to withdraw the study at any time. They were assured of the confidentiality of their information. Presentation of the study results to participants and authorities was optional. The IUMS had the right to publish the paper extracted from the thesis.

Authors contributions

Conceptualization: Mina Jafarizadeh and Zahra Ahmadi; Methodology: Mina Jafarizadeh and Zahra Ahmadi; Investigation: Mina Jafarizadeh and Zahra Ahmadi; Writing-original draft: All authors; Writing-review & editing: All authors; Funding Acquisition: Mina Jafarizadeh; Resources: Mina Jafarizadeh and Zahra Ahmadi; and Supervision: All authors.

Conflicts of interest

The authors declared no conflict of interest.

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