Internet Addiction among Iranian Adolescents: a Nationwide Study

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Abstract- Problematic use of the Internet by children and adolescents is a newly emerging disorder that has alerted health authorities throughout the world. In Iran, despite the very high speed rate of Internet spread, there is not enough data on the rate of Internet addiction among the adolescents. This study is the first nationwide study that addresses this issue. Overall 4500 students of high school or pre-college schools were recruited from 13/31 provinces of Iran by a cluster sampling method and 4342 (96%) participated. Two self-rated questionnaires (one demographics and one Young's Internet addiction scale) were filled b the participants. Data were analyzed by SPSS software. 962 (22.2%) of the study participants were labeled as having "internet addiction." Males were significantly more likely to be an internet addict (P<0.001). Students whose father and/or mother had a doctorate degree were most likely to have Internet addiction (P<0.001 for both). Job engagement of mothers was significantly associated with students' internet addiction, and the least rate of addiction was observed when the mother was a housewife (P<0.001); having no exercise was associated with the highest rate of Internet addiction (P<0.001). Stepwise logistic regression models showed gender (male), older age, mother's occupation, family's financial status (either very high or very low), low quality of family relationship, and students' lower levels of religious devotion were significantly associated with having Internet addiction. This study showed that Internet addiction in Iranian adolescents is prevalent, and has several independent factors, from which, family relations is most likely to be modifiable. Improvements in family relations and more strict parental supervision, especially when mothers have active job employment, are recommended.

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Keywords: Internet; Addiction; Iranian; Adolescents

Introduction

After its introduction in the early 1980s (1), the Internet has become an integral part of daily life for the majority of people, especially youngsters. The pre-college students are probably the most frequent users of the Internet, both for academic reasons or entertainment. In fact, one can hardly find an aspect of the ordinary life that would be spared from Internet use. This dramatic increase in the use of the Internet, however, was not free from non-favorable effects. Media is full of reports indicating catastrophic events happening due to the excessive use of the Internet, especially among adolescents and young adults. Progressive disturbances in the familial and social connections are considered both as a consequence and result of the mentioned interruption of human relations. The introduction of social networking sites, most notably Facebook and online games has made the problem even more profound.

Research suggests that the problematic use of the Internet be prevalent among undergraduates accounting for less than 10% (2) up to 38% (3). This large discrepancy comes both from the cultural differences and the study's definition criteria. As a developing country, Iran has enjoyed a dramatic increase in the access to the internet from about 11% in 2005 to over 53% in 2012 (4).

However, data on the potential problematic use of Internet in this country are scarce. In a study of limited sample size, Ghassemzadeh *et al.,* (5), have reported characteristics of pathological use of the Internet by Iranian students, and found the surprising rate of as low as 3.8%. However, we believe that the patient population in this study was not only much limited but also, it is not a reliable representative of the country. So, we conducted a large study of Iranian adolescent pre-college students selected through cluster sampling

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from eleven Iranian provinces. In this study, we evaluated the rate and demographic features of Internet addiction among Iranian adolescents.

Materials and Methods

Study protocol

The study was conducted using a cross-sectional methodology. Study subjects were selected from students of high school and pre-college stage. The sample size has been calculated from Krejcie and Morgan's tables (6), which was 450, but to strengthen the study protocol, we enlarged the study population size to 10 times larger, as our budget permitted; and 4342 (96.5%) participated in the survey. The study parameters were recruited from the students using standardized self-rated questionnaires.

Sampling method

The sampling method was multi-stage cluster sampling which was performed in 13 (out of 31; 42%) provinces of Iran. The provinces were from all the Geographical, sub-ethnic and -cultural populations (Figure 1): Ardebil (North East); Isfahan (Centre); Tehran (Centre); all the 3 (Northern, Razavi, and Southern) Khorasan provinces (East), Khuzestan (South West); Fars (South); Ghom (Centre); Kurdistan (West); Kerman (South East); Mazandaran (North); and Hamadan (West).

In all the cases, samples were recruited from the center-city of the province. Four schools (one governmental-fund and one private for each gender) were selected randomly from each city for inclusion into the study, and from each school, 3 or 4 classrooms were randomly selected for inclusion, as from each grade of the school, there was at least one classroom included.

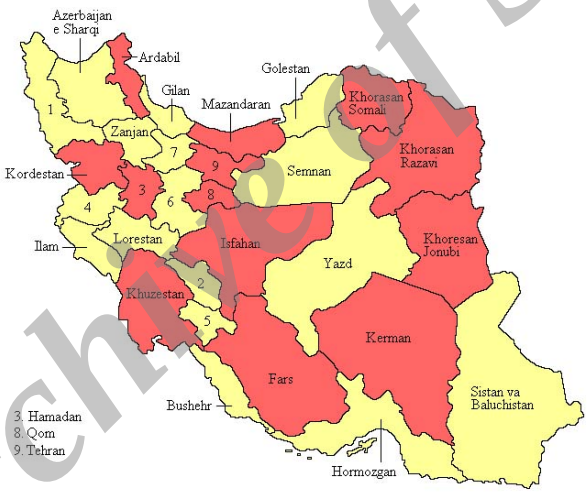

Figure 1. The provinces of Iran from which the study participants selected

Questionnaires

A standard questionnaire was used to collect data from the students. The questionnaire language was in a simple and fluent Persian. Before filling the questionnaire, students were given equal description about the aims and importance of the survey, as well as guidelines on how to answer the questions. The questionnaire was anonymous, and students were assured that there would be no consequence on any answer they choose for any question. Students were given enough time to fill the questionnaire, and they also could ask questions if they had difficulty on comprehending the questions.

The questionnaire composed of two parts: the first part gathered data on the demographic and personal aspects of the students and their families. The second part consisted of the Young's Internet Addiction Scale (IAS) (7,8) evaluating different aspects related to the Internet addiction. This questionnaire (Young's IAS) consisted of 20 questions each of them had five options to choose from: never (score 1), rarely (2), sometimes (3), often (4), and always (5). The total score for the Young's IAS ranges between 20-100. The subjects with scores over 50 were defined as the Internet addiction group. The range of the total Young's IAS score 50–79 is regarded as having "intermediate" Internet addiction,

while the total score of ≥80 has been regarded as having "severe" Internet addiction.

Ethical considerations

The study has been approved by the Ethics Committee of the Baqiyatallah University of Medical Sciences. The questionnaires were anonymous, and participation was not mandatory. Participants were assured that there would be no consequence on their answers.

Statistical analysis

Software SPSS version 17.0 (SPSS Inc, Chicago, Il, USA) has been used for analyses. Chi-square test was used for analyzing categorical data. Univariate and multivariable logistic regression models were used for analyzing factors independently associated with Internet addiction. A *P*.value<0.05 was considered significant.

Results

Overall 4342 high school and pre-college students participated in the study. Mean ± SD age of the participants was 16.6±1.5 years. There were 2114 (49.5%) males and 2155 (50.5%) females; (73 missing data). 855 (24%) of the students were at the first high school stage, 1006 (28.3%) at the second, 1049 (29.5%) at the third, and 650 (18.3%) were pre-college students (782 missing or confusing data).

327 (7.6%) declared that they had "no" familiarity with the Internet, and 546 (12.6%) declared that they did not use the internet "at all." 418 (9.9%) of the students had not computer in the house (100 missing data). Most of the participants had no (1612 (38.8%)) or minimal (861(20.7%)) access to high-speed Internet (ADSL), while 424 (10.2%) of them had constant access to ADSL and 487 (11.7%) reported having high level of access to ADSL.

Table 1 summarizes data of the Young's IAS questionnaire. Number of 962 (22.2%) of the study participants were labeled as having "internet addiction." 58 (1.3%) of them had "severe" internet addiction (IAS score of over 80) while 904 (20.8%) had "moderate" internet addiction. Boys were significantly more likely to be an internet addict (599(28.3%) vs. 345 (16%), respectively; *P*<0.001), but the disparity of internet addiction severity among the two genders was mostly prominent in moderate addiction (569(26.9%) vs. 320 (14.8%), respectively) than in severe addiction (30 (1.4%) vs. 25 (1.2%), respectively).

Table 1. Frequencies of answers to the questions of Young's IAS form

Questions	Never	Rarely	Sometimes	Often	Always
Q1 n(%)	1396 (32.2)*	1108 (25.5)	766 (17.6)	729 (16.8)	343 (7.9)
Q2	2360 (54.4)	886 (20.4)	632 (14.6)	323 (7.4)	141 (3.2)
Q3	2593 (59.7)	649 (14.9)	548 (12.6)	316 (7.3)	236 (5.4)
Q4	2423 (55.8)	819 (18.9)	585 (13.5)	326 (7.5)	189 (4.4)
Q5	2444 (56.3)	852 (19.6)	529 (12.2)	309 (7.1)	208 (4.8)
Q6	2894 (66.7)	667 (15.4)	404 (9.3)	238 (5.5)	139 (3.2)
Q7	2264 (52.1)	712 (16.4)	511 (11.8)	379 (8.7)	476 (11)
Q8	3015 (69.4)	588 (13.5)	396 (9.1)	226 (5.2)	117 (2.7)
Q9	2692 (62)	687 (15.8)	466 (10.7)	288 (6.6)	209 (4.8)
Q10	2000 (46.1)	851 (19.6)	653 (15)	467 (10.8)	371 (8.5)
Q11	2025 (46.6)	910 (21)	633 (14.6)	449 (10.3)	325 (7.5)
Q12	3054 (70.3)	461 (10.6)	362 (8.3)	229 (5.3)	236 (5.4)
Q13	2518 (58)	821 (18.9)	474 (10.9)	281 (6.5)	248 (5.7)
Q14	2852 (65.7)	614 (14.1)	407 (9.4)	255 (5.9)	214 (4.9)
Q15	3031 (69.8)	550 (12.7)	388 (8.9)	209 (4.8)	164 (3.8)
Q16	1824 (42)	894 (20.6)	644 (14.8)	473 (10.9)	507 (11.7)
Q17	2217 (51.1)	765 (17.6)	577 (13.3)	390 (9)	393 (9.1)
Q18	2744 (63.2)	644 (14.8)	476 (11)	282 (6.5)	196 (4.5)
Q19	2580 (59.4)	726 (16.7)	548 (12.6)	264 (6.1)	224 (5.2)
Q20	3217 (74.1)	468 (10.8)	319 (7.3)	194 (4.5)	144 (3.3)

*n(%)

Student whose father had a doctorate (than those with lower degrees) were significantly more likely to be an internet addict (39% vs. 22%, respectively; *P*<0.001); the severity of internet addiction was also associated with the students' `father's education (5.5% for those with a doctorate father; *P*<0.001). A greater significance level was found for mothers' having a doctorate (57% vs. 28%, respectively; *P*<0.001). Students whose father was unemployed seeking for a job were highly more likely to have severe internet addiction (62% vs. 23%, respectively; *P*<0.001). Job engagement of mothers was significantly associated with students' internet addiction,

and the least rate of addiction was observed when the mother was a housewife (20% vs. 35%, respectively; *P*<0.001) and severe internet addiction was also more prevalent among mothers having a job (20(3.3%) for job active mothers vs. 33 (0.9%) for mothers with no active job; *P*<0.001), but paternal employment was not a predictor of severe internet addiction (42(1.3%) vs. 11 (1.2%), respectively; p>0.1); nevertheless, fathers' unemployment was associated with more frequent "moderate" internet addiction (229(24.8%) vs. 655 (20.2%), respectively; p=0.01). Exercise was also a predictor of severe internet addiction; highest rate of internet addiction was observed in students who stated having no exercise (31% vs. 27%; *P*<0.001), and they also were significantly more likely to be severely internet addict than those who had exercise (from minimal to professional) (14 (4.2%) vs. 41 (1%), respectively; *P*<0.001). Students with "very weak" family financial condition was most likely to have either internet addiction (41.8% vs. 23%, respectively; *P*<0.001) or severe internet addiction (3.8% vs. 1.3%, respectively; *P*<0.001). Fitness in family relations was also a predictor of internet addiction and its severity with having higher rate of addiction (53 (43.1%) for quarrelsome families, 68(41.2%) for families with cold relations, 300 (28.4%) for families of not bad relations, 314 (20.4%) for families of warm relations, and 209 (15.3%) for family with very warm relations; *P*<0.001) and severity constant to having higher family relation damage (6(4.9%) quarrelsome, 4(2.4%), cold relations, 16 (1.5%) not bad relations, 15 (1%) warm relations, and 13 (1%) for very warm family relations; *P*<0.001). Having bad social relations was also associated with higher rate of internet addiction (33.8% vs. 24%, respectively; *P*<0.001) or its severity (4.4% vs. 1.1%; *P*<0.001). The level of religiosity was also directly associated with the rate of severe internet addiction (no religious morals: 9(6%), low: 9(3.4%), usual: 18 (2%), high: 7 (0.6%), and devote: 12 (0.7%); *P*<0.001).

Then, stepwise logistic regression models were employed to find independent associations of Internet addiction (table 2). Gender (male), older age, mother's occupation, family's financial status, quality of family relationship, and students' level of religious devotion were significantly associated with having Internet addiction.

Table 2. Multivariate logistic regression model evaluating independent associations between Internet addiction and demographic data of the participants

Variable	Sig.	Odds ratio (OR)	95%oCI for OR Lower	Upper
Gender	<0.001	0.464	0.394	0.547
Age	<0.001	1.224	1.163	1.289
Mother's occupation	0.05	1.238	1.0	1.537
Financial status (compared to very weak)	<0.001			
Very good	0.358	1.317	0.732	2.369
Good	0.040	0.558	0.320	0.972
Intermediate	0.002	0.425	0.244	0.739
Weak	0.001	0.352	0.188	0.661
Quality of family relationship (compared to quarrelsome)	<0.001			
Very good	<0.001	0.248	0.156	0.393
Good	<0.001	0.375	0.239	0.588
Usual	0.038	0.620	0.395	0.973
Cold	0.875	1.044	0.613	1.777
Religious devotion (compared to nothing)	<0.001			
Very high	<0.001	0.400	0.270	0.593
High	0.006	0.571	0.383	0.851
Usual	0.033	0.646	0.432	0.965
Low	0.124	0.695	0.437	1.104

*confidence interval

Discussion

Internet addiction has been known as an emerging psychiatric disorder which is associated with a high rate of mental and physical morbidity and even mortality in different societies, although there is controversy in legalizing it as a mental disorder (9). The critical aspect of internet addiction is its very high prevalence among youngsters, especially in school children. In this study, we found a worrying high rate of over 22% among Iranian high school and pre-college students. Our study is in controversy with a study by Ghassemzadeh *et al.,*

(5) that reported 3.8% internet addiction rate among Iranian high school students. We believe that the very low rate of internet addiction reported by Ghassemzadeh *et al.,* may be due to selection bias, or different tools they used for their evaluation. Our study population was several times larger and selected through cluster sampling from different provinces of the country.

The rate of internet addiction reported from different countries varies widely; in Kubey, Lavin & Barrows conducted a research amongst 576 students in Rutgers University first year students found 37.7% of the group described as addictives (3). The prevalence of Internet addiction among Internet users of Central Greece was reportedly 8.2% (2); while it has been 6.7% in a similar subpopulation to ours in Hong-Kong, China. A study on 275 students from Florence, Italy, reported that 5.4% of the students were Internet addicted (10). A South Korean study on elementary school children showed that severe internet addiction was present in 0.9% of children while intermediate addiction was present in 14% (11). Another Korean study demonstrated that over 28% of Korean high school students were intermittent Internet addicts while 4.3% were constant Internet addicts (12). This latter study very well shows the rationale behind the very wide disparity between different studies even in the same area (like ours and the study by Ghassemzadeh *et al.,* (5)).

Factors predicting Internet addiction in Iranian school students are also very interesting. Male gander was one of these factors that represented a highly significant association to the Internet addiction. A study from Taiwan, China showed that Internet addiction is not only more prevalent among males, but also it is associated with higher rates of depressive disorders in this particular gender, and not in females (13). Jang *et al.,* (REFF) in a study on South Korean high school students also showed a male predominance in the rate of Internet addiction. Using the same instrument as ours (Young's Internet addiction scale) Yoo *et al.,* (11) also reported a larger than two times rate of Internet addiction among males of elementary school than females. High school children from Italy also showed a male predominance in the Young's internet addiction scale score (10). It seems that male predominance on Internet addiction rate among children and adolescents is a globally constant observation, although we found one study in which there was no gender discrimination in adolescents with Internet addiction (14).

Older age was also an independent factor significantly related with the Internet addiction in the current study. Yoo *et al.,* (11) also reported that children of more advanced ages are significantly more likely to be an internet addict. However, King-wa *et al.,* (14) found age as a factor of no role in predicting Internet addiction. An interesting finding of this study is that although, in univariate analyses, paternal educational rate and employment status was significantly associated with Internet addiction in our Iranian adolescent population, in multivariate analysis, the only parental factor remained significant was maternal job occupation. Students whose mother had an active job were significantly more likely to be internet addict, and this finding signifies maternal role in supervising children's Internet activities, and alerts families in which mothers are employed; therefore, we recommend mothers in these families pay more attention on their children's Internet usage.

The financial status of the family was also another independent factor that could predict Internet addiction. Surprisingly, this relation was most significantly on the two extreme sides where Very poor and very rich kids were most likely, and similar to each other, to represent Internet addiction, and other subpopulations were significantly less Internet addict. However, quality of family relation was a stepwise predictor of Internet addiction with better relations representing less addiction rate. Previous evidence also suggests that Internet abuse is strongly correlated to family relation impairment (10). All the above mentioned data pushes us to improve family relations between children and parents and parental control, especially by mothers, on adolescents' Internet activities. In conclusion, this study showed that Internet addiction in Iranian adolescents is prevalent, and has several independent factors, from which, family relations is most likely to be modifiable.

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