The Prevalence of Excessive Mobile Phone Use and its Relation With Mental Health Status and Demographic Factors Among the Students of Gonabad University of Medical Sciences in 2011 - 2012

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Background: The excessive mobile phones use is a common problem among students, so it is necessary to identify this phenomenon's relevant factors in each university for appropriate planning.

Objectives: The study aim was to determine the prevalence of excessive mobile phone use and its relationship with mental health status and demographic factors on the students of Gonabad University of Medical Sciences in 2011 - 2012.

Patients and Methods: In this cross-sectional study, all 700 students in the university were surveyed and completed demographic information form, GHQ-28, mobile phone addiction scale (MPAI). The data were analyzed in SPSS-18 software and by Chi-square test, student t-test and ANOVA were used at the significant level of $P < 0.05$.

Results: The prevalence of excessive mobile phone use was 36.7% on the students. There was a significant relation between the prevalence of excessive mobile phone use and mental health status in general ($P > 0.05$), and also somatization ($P < 0.05$), anxiety and depression specifically ($P < 0.05$), but no significant relation was found between the excessive mobile phone use and social dysfunction ($P < 0.05$), and also sex, age, marital status, settlement, and academic achievement ($P < 0.05$). But there was also a significant relation between education degree (in MSc and doctoral degree students) and the prevalence of excessive mobile phone ($P > 0.05$).

Conclusions: According to rather high prevalence of excessive use of mobile phone and existence of significant relation between the prevalence of excessive mobile phone use and mental health problems, it is recommended to improve their mental health status and acceptable social relationship instead of dependency on mobile phone use that can inreturn reduce the negative effects of excessive mobile phone use.

Keywords: Mental Health; Cellular Phone; Prevalence; Students

1. Background

A profound revolution has taken place in communication technology today that has influenced talent, taste and the way of relationship and spending of leisure time by youth (1). Some information technology (IT) experts speak of a new era coming by development of communication technologies such as satellite, internet, and mobile phone in the latest decades so some authors called it "network or information society" (2). Mobile phone because of the ever-availability and its mobility application has created a dramatic interest for youth in comparison with other communication technologies and has also provided the communication status from everywhere or in every time and people can also be online all the time, responsive and available with SMS (short message system), while chatting needs facilities like computer, inter- net connection and interaction of two persons that one may not be online at the same time (2). Addiction to internet and new communicational tools as a health problem has recently been considered as a mental disorder (3). Goldberg for the first time used "Internet addiction disorder" term to identify the characteristics of individuals who use the Internet and show some problems of themselves (4). The concept of addiction to mobile phone use was introduced at first by Bianchi and Phillips in 2005 (5). According to Lorent's idea, mobile phone has made a new and private environment that was not available for anybody before and also created an opportunity for others to enter or intervene the other people's limitation. Then such a status has an important role in individual identity of the youth and let them set or plan a meeting or trans-

fer a message without the other person knowing and permission (6). As, the term "mobile phone addiction" has not been included in any of the diagnostic classification systems, we used the term "excessive mobile phone use" in this study instead and this term has emerged from mobile phone Addiction Scale (MPAI) cut off point.

The studies show that excessive mobile phones use can be associated with different aspects or problems of mental health. For example, studies showed that mobile phone addiction could be related or effective on impulsivity and addiction (7), low self-esteem and depression (8), control problems and the symptoms of depression, anxiety and Internet addiction and lower self-confidence (9), high impulsivity, feeling of loneliness and social anxiety (10), extroversion and self-esteem (5), depression, distractibility, lack of tolerance, withdrawal, and escape (11), impulsivity and loneliness (12) and negative consequences such as emotionally-damaged relationships and also reduction of academic achievement (13), family relationship decrease, social isolation, loneliness and depression (7, 14); in a study conducted on Hong Kongese youth, psychological characteristics of so-called addiction of mobile phone were identified and four addiction symptoms to mobile phone use were shown such as: loss of control and complaining, anxiety and ravenous and excessive spending habit, withdrawal, neglecting or loss of productivity. The results showed that those who feel mostly fatigue in unemployment times are mostly dependent on mobile phone use and on the contrary the individuals with more self-esteem feel less dependency on or less willing to use a mobile phone (15). Pathology resulted from information and communication technology application and its usage in Taiwanese youth showed that they have used mobile phone mostly for contacting each other, SMS transferring, electronic games, taking photos and connecting to internet. Some of these students had excessive dependency on SMS that resulted in mental symptoms and social negative outcomes, for example women will be angry if they have not their mobile phone with themselves when they are away from home. However, dependency on SMS might be because of extreme need of interpersonal relationship and they would think that they might be occupied mentally with fear of rejecting and missing by other persons, if they are not available (16). One of the groups entering the world of mobile phone is the group that its individuals have social anxiety and they do not feel well and are afraid of not considering by others or to be missed. Anxious students feel that they have less ability than other students in performing their duties (17). This is also considerable that one individual can communicate through mobile phone without showing any kind of mental symptoms. For example as reported from Japan, first-year University students in Japan exchange an average of 20.1 SMS each day (16). Mobile phone users at first had a limited imagi-

nation of this technology and its necessity; however its application was expanded over the time (18). The first motivation of most users of mobile phone use is an instrumental application and using it in emergency situations. But during the time, the kind of usage is changed from instrumental to non-instrumental application and continual contact by mobile phone results in more emotional interactions and leads to increase of trust and social cohesion (19). While Laramay knows the excessive mobile phone use as the reason that will maintain and enhance social relationships and interactions and will relieve loneliness feeling (20). However, some have shown that the problems resulted from mobile phone use is in relation with sex, self-monitoring, and motivation of admiration and not in relation with loneliness (21).

Some studies have estimated the prevalence range of mobile phone addiction from 0-38% (8). Also, in a study that has conducted on nine secondary school students in Madrid, it is reported that the prevalence of addiction to mobile phone use is 20%. In this study mobile phone use was associated with sex, location of school, family economic status, smoking, excessive alcohol consumption, depression, and failure in school (22). Considering limited studies on excessive mobile phone use among students in the country that are from the most sensitive groups and responsible men of the future in the country, and also because of the lack of studies on excessive mobile phone use relationship and mental health status.

2. Objectives

This epidemiological study was conducted to determine the prevalence of excessive mobile phone use, symptoms and its relation with demographic factors (age, marital status, academic degree, settlement), academic achievement and mental health in Gonabad Medical Sciences students.

3. Patients and Methods

This is a cross-sectional study. The study population included all 700 students who have been present and studying (from May to June 25, 2011) in Gonabad University of Medical Sciences. In this study all the 700 students were surveyed via census. The students were studying in 10 academic fields including medicine (MD), nursing, midwifery, public health, professional health, environmental health, operation room, anesthesia, laboratory sciences, medical emergency that all participated in the research willingly. The data were collected by mobile phone addiction scale (MPAI) and general health questionnaire (GHQ-28). Mobile phone addiction scale is a self-report scale with 17 questions developed for the first time by Leung in 2007 (15), but the original version was presented by Bianchi and Phillips in 2005 (5). In this questionnaire, one score is allocated to each of the options as (0, 1, 2, 3,

and 4). The cut-off point score was considered 51 on this questionnaire and those who obtained the scores higher than 51, were considered as addicted to mobile phone use. The internal reliability of the initial version was reported 0.093 by Bianchi and Phillips (5). Leung reported its reliability with Cronbach's alpha above 0.90 (15). For the first time in Iran, Naderi and Haghshenas determined its validation in a research. At first, they translated the original scale into Persian, and back-translation was also performed, then its content validity was approved by field specialists (12). In addition, its correlation coefficient with the Zuckerman emotion seeking scale (P < 0.04 and r = 0.3) and its reliability coefficient with Cronbach's alpha were determined 0.8 and 0.57 with Split-half method. General health questionnaire (GHQ): It is a self-report screening questionnaire used in clinical settings to detect those who have a mental disorder. This questionnaire contains 28 questions included 4 subscales with 7 questions on somatization, anxiety, social dysfunction and depression which is marked from 0 to grade 3. Grade 6 or higher is for sub-tests and grade 22 or higher was the test's cut off point that was initially suspected to have a mental disorder (23). Validation studies on GHQ-28 showed high validity and reliability of the questionnaire (24). In a meta-analysis of 43 studies results, it is found that the mean sensitivity of it is 0.84 and its mean specificity is 0.82 (25). In the study of Yaghoobi sensitivity, specificity and reliability of this questionnaire on the general population were determined in the best cut off point, 23, 0.86, 0.82 and 0.88, respectively (25). Psychometric survey of this questionnaire has been performed on the country (Iran) students and different studies in Iran have reported its reliability coefficient 84% to 91% and the best cut off point has been determined 23 for this questionnaire (26). The cut-off point 23 used in the present study has been based on Ansari's study. Then the students who achieved the score 23 and higher totally in the test were grouped abnormal and those who got lower than 23 were put in normal group from mental health point of view. It should be mentioned that students categorizing in academic achievement have been performed based on a total mean score of their all semesters in three classes of weak with mean score of 11-15, average, 15-18 and good, higher than 18 out of total score of 20 in the exams.

The procedure of the research was based on considering ethical considerations such as assuring the students to freely participate in the research. They felt sure from confidentiality of demographic information and presenting of the research results after the researchers' explanations. We also expressed the aims of the research and the way to fill out the questionnaires. The subjects were surveyed based on census method and the study was conducted after approving by the research committee. When the questionnaires were justified and ready, the distributing group referred to the dormitories of Narjes, Zeinab,

Yas-e-Nabi and Bental Hoda (girls') and Fajr (boys'). All the students were in the mentioned dormitories and some as native students were invited to fill out the forms during two weeks. After coordinating with the research committee and vice chancellor of the students' affairs (the managing center of the dormitories) we distributed the related questionnaires including of 4 sections of demographic information, GHQ-28, mobile phone addiction scale (MPAI) and different factors related to excessive mobile phone use among the students who were as the subjects our study. To do the present study statistics, at first the data were derived from the questionnaires and were recorded in SPSS version 18. The frequency, frequency percent, data distribution, mean, variance and the other dispersion parameters were obtained and then based on the research objectives and the evaluation of indicators, Chi-square test, student t-test and ANOVA were used at the significance level of P < 0.05.

4. Results

Based on descriptive data obtained from Table 1, it is stated that 44% of the subjects were women and 56% were men. The highest percentages of the samples or 93.9% were from the age group of 18- 24 years and the lowest with 2% from over 30 years of age. Most of the students with 78.4% were unmarried, while 18.9 were married, and the lowest with 2.7% were divorced. Considering degree of education, 8.4% were studying in associate degree, 85.7% in bachelor, 1.7% in master and 4.1% in professional doctorate degree (MD). Furthermore, 52.9% of the subjects were native and 47.1% were non-native students. In terms of academic achievement 13.9% had a good academic achievement, 65.3% average and 20.9% of the students had a weak percentage of academic achievement. Considering their mental health status, 35.5% had a normal and 64.5% had an abnormal status, respectively. The results of the subscales of the questionnaire (GHQ-28) showed that many of the students (89.1%) manifested social dysfunction symptoms, while only 29.7% of them reported symptoms of depression. Somatization and anxiety among the students have also been reported 52.4% and 48.3% respectively. Based on Table 2 results, 443 students (63.3%) used mobile phone normally, while 257 students (36.7%) had used mobile phone excessively. The results from MPAI questionnaire showed that 3 main signs of excessive mobile phone use expressed by students were "as the only way of communication and contacting with friends with 91.7%, "using mobile phone while feeling lonely" with 88.9%" and "using mobile phone in feeling of separation and isolation" with 86.9%, while the 3 least signs were respectively related to "hiding the speaking time length with mobile phone from other persons" with 56.3%, " complaining of friends and relatives for much using of mobile phone" with 57% and "spending much time with mobile phone" with 63.1%.

Table 1. The Frequency Distribution of the Samples on Demographic and Mental Health Variables

	Frequency	Percent
Gender		
Male	310	44
Female	390	56
Age group		
18 - 24	657	93.9
24 - 30	29	4.1
< 30	14	2
Marital status		
Single	549	78.4
Married	132	18.9
Divorced	19	2.7
Academic degree		
Associate	59	8.4
Bachelor	600	85.7
Master	12	1.7
Prof., Med., Dr. (MD)	29	4.1
Settlement	370	52.9
Native		
Non-native	330	47.1
Academic achievement	146	20.9
Weak		
Average	97	13.9
Well	457	65.2
Mental health status		
Normal	248	35.5
Abnormal	450	64.5
Total	700	100

Table 2. The Frequency Distribution of the Samples on How to Use Mobile Phone

How to Use	Frequency	Percent
Usual usage ≤ 51	443	63.3
Excessive usage > 51	257	36.7
Total	700	100

The results of Table 3 showed that there was not any significant relation between excessive mobile phone use and sex (P = 0.25), age (P = 0.32), marital status (P = 0.43). While there was a significant relation between education degree and rates of excessive mobile phone use (P = 0.02). Students of medicine doctorate (MD) with 58.6% (17 students) and postgraduate students (Masters) with 16.7% (2 students), reported the highest and the lowest excessive mobile phone use, respectively. The rate of excessive mobile phone use had also been 38.8% in undergraduate students (bachelors) and 28.8% in associate students. The table results also showed that there were not also a significant difference between the rate of excessive mobile phone use and settlement (P = 0.45%) of the students with academic achievement (P = 0.88%). But there was a significant difference between excessive mobile phone use with mental health status (P = 0.001), because 79.8% of the students using mobile phone excessively did not show a stable status of mental health. According to the results of Table 4, it is clear that there was a meaningful difference between somatization problem and the rate of excessive mobile phone use (P = 0.001). 63.4% of people who used mobile phones excessively, had a somatization problem and 36.4% did not have this problem, however this was not the same for anxiety, so that the excessive mobile phone use was 31.5% in anxious students, but it was 81.5% in non-anxious students that it is meaningful from statistical point of view (P = 0.001). There was also a significant difference between excessive mobile phone use and depression, so that the rate of dependency to mobile phone was 45.9% and it was 64.1% in non-depressed students (P = 0.001), but no significant difference was observed between excessive mobile phone use and social dysfunction (P = 0.46%).

5. Discussion

The prevalence of excessive mobile phone use has been 36.7% in our subjects that was higher (20%) than the rate of addiction to mobile phone in Naderi and Haghshenas' study results (12), but it is close to addiction rate stated in Leung study (15). The difference of these statistics was possibly related to demographic and cultural factors (i.e. family dependency, recreational facilities and habits). For example Naderi et al. study (12) was conducted on students of Ahvaz Islamic Azad University that were most native students and were studying in human sciences fields with cultural and social differences. The results showed that 64.5% of the subjects had abnormal mental status. These results are high in comparison with prevalence rates reported by Karami, 36.5%, Tavakolizadeh et al. 28% and Akkashe 28.4% (27-29). The difference can be resulted from difference in students' population, the conducting time of the survey, tools and using methods and age ranges of the subjects. Moreover the research results in this field have shown that when disorders diagnosis is performed based on screening questionnaires (such as SCL-90-R and GHQ-28) its prevalence rises up (30). The results of this study showed that there was a significant relationship between excessive mobile phone use and mental health of the students (P = 0.001). So, 205 students (79.8%) of 257 students using mobile phone excessively, showed mentally an abnormal status and only 52 students (20.2%) of the excessively users had a normal status. While there has been a significant relation between excessive mobile phone use with 3 subscales of somatization, anxiety and students depression and these results is in accordance with the results of similar studies in this field (5, 10, 11, 15).

Table 3. The Frequency Distribution of Usage Level of the Samples on Demographic & Mental Health Variables

Related Factors	Usage Level				Total		P Value
	Usual		Excessive		Frequency	Percent	
	Frequency	Percent	Frequency	Percent			
Gender							0.25
Male	189	61	121	39	310	44	
Female	254	65.1	136	34.9	390	56	
Age group							0.32
18 - 24	416	63.3	241	36.7	0	0	
24 - 30	16	55.2	13	44.8	0	0	
< 30	11	78.6	3	21.4	0	0	
Marital status							0.43
Single	341	62.1	208	37.9	549	100	
Married	90	68.2	42	31.8	132	100	
Divorced	12	63.2	7	36.8	19	100	
Academic degree							0.02
Associate	42	71.2	17	28.8	59	100	
Bachelor	379	63.2	221	36.8	600	100	
Master	10	83.3	2	16.7	12	100	
Prof., Med., Dr. (MD)	12	41.4	17	58.6	29	100	
Settlement							0.45
Native	236	65	134	35	370	100	
Non-native	207	63.3	123	36	330	100	
Academic achievement	90	20.3	56	21.8	146	20.9	0.88
Weak							
Average	292	65.9	165	64.2	457	65.3	
Well	61	13.8	36	14	97	13.9	
Mental health status							0.001
Normal	196	44.4	52	20.2	247	35.5	
Abnormal	245	55.6	205	79.8	450	64.5	
Total	443	63.3	257	36.7	700	100	

Table 4. The Frequency Distribution of Usage Level of the Samples on Different Sub-scales

Sub Scales	Usage level				Total		P Value
	Usual		Excessive		Frequency	Percent	
	Frequency	Percent	Frequency	Percent			
Somatization							0.001
≥ 6	203	46	163	63.4	366	52.4	
> 6	238	54	94	36.6	332	47.6	
Anxiety							0.001
≥ 6	281	63.4	81	31.5	362	51.7	
> 6	162	36.6	176	68.5	338	48.3	
Depression							0.001
≥ 6	90	20.3	118	45.9	208	29.7	
> 6	353	79.7	139	54.1	492	70.3	
Social Abnormality							0.46
≥ 6	392	88.5	232	90.3	624	89.1	
> 6	51	11.5	25	9.7	76	10.9	
Total	443	100	257	100	700	100	

From psychologists point of view, excessive mobile phone use is a kind of addiction to technology and it is an explanation for this coordination (5, 12, 15), Then, it is expected that a meaningful relationship between the prevalence of excessive mobile phone use and psychopathology be observed. About the relationship between the prevalence of excessive mobile phone use and its related factors, the results suggested that there was not any significant relationship between demographic factors, age, sex, marital status, settlement and academic achievement with mobile phone use (P > 0. 05) which these findings are not in accordance with Bianchi, Philips and Leung study results (5, 15). The reason of this contradictory in both of the studies samples was because they were performed in non-academic field or on general population. In these studies also the range of ages and the number of samples were different with the present study. Bianchi and Philips's study was conducted on 195 people of 18-85 years of age and in Leung's study the subjects were 402 juveniles of 12-20 years of age. The results of the present study showed that there was a significant relationship between the way of excessive mobile phone use and academic degree that the most rate of excessive mobile phone use was observed among students of medicine doctorate (MD). However, to justify the findings, the length of academic period, family settlement distance and being non-native in comparison with other students possibly caused them to have more contacts with their relatives and families by mobile phone. This subject is more approved when 25% of them announced that the only tool and way of communication with friends had been mobile phone in response to one of the items in MPAI questionnaire. The present results on excessive mobile phone use distribution signs derived from 17 questions of MPAI questionnaire showed 3 main signs of excessive mobile phone use expressed by students as "the only way to communicate with friends" (91.7%) "using mobile phone when feeling lonely" (88.9%) and "using mobile phone in sense of separation and isolation" (86.9%). while the 3 least prevalent signs were respectively related to "hiding the length of speaking time with mobile phone from others" with 56.3%, "complaining of friends and relatives for much using of mobile phone" with 57% and "spending much time with mobile phone" with 63.1%. These results are not in accordance with Leung's study on the most common symptoms of "complaining of others from excessive mobile phone use" and the study results of Fan Chen (11) mobile phone as the most significant sign of distraction, however Leung's study is similar to the present study from research tools point of view (MPAI questionnaire), but that research has been conducted on Hong Kongese youth that cultural, demographic and academic differences of the samples have possibly influenced the responses of the questionnaire. For example the subjects have not stated that they had been pauper or unable to pay their mobile phone bill, but in Palen et al. study (18) the participants have pointed to this as a problem that could somehow be a reflex of differences in socio-economic status of the families, parents' financial support and/or students income in two different cultures. The difference or non-coordination of the results with Fan Chen study (11) in this section can possibly be attributed to differences related to research measurement tool. Considering three main signs of the study, it is shown that emotional factors (feeling separation, loneliness, isolation and motivation for communication) have had an important role in mobile phone use that these factors naturally will be more effective and highlighted in special status of being a student (far from the family, relatives and formal status of the environment). Considering rather high prevalence of excessive mobile phone use and the role of emotional factors on this problem and also the relation of excessive mobile phone use with mental health status of the students especially social dysfunctions, it is then recommended to perform some measures for students' mental health status improvement, mostly training of social skills and providing proper interpersonal relationship of the students not only to have a positive impact on their mental health status, but also to provide a condition in which the students prefer appropriate social interactions to communication technology addiction. However, necessary trainings on how to use these technologies appropriately are a serious task in today's world that needs enough consideration and attention since it can decrease some of its complications.

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Authors' Contribution

Study concept and design: Jahanshir Tavakolizadeh and Sirvan Ahmadpour. Interpretation of data: Siravan Ahmadpour and Amir Pourgheisar. Darafting of manuscrpt; Jahanshir Tavakolizadeh, Alireza Atarodi, Siravan Ahmadpour and Amir Pourgheisar. Doing critical revision of the manuscript for important intellectual content: Jahanshir Tavakolizadeh.

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