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Evaluation of College Students'the Level of Addiction to Cellular Phone and Investigation on the Relationsship Between the Addiction and the Level of Depression

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Abstract

The study is a cross sectional study carried out on Osmangazi University Health High School students between 1st November and 31st December 2012. The study group consists of 700 students (%84.2). Problematic Cellular Phone Use Scale has been used for the evaluation of addiction to cellular phone and for the evaluatıon of the level of depression Beck Depression-Scale has been used. In the analysis of data, Ki-Sguare-test, Mann-Whitney U test and Spearman Correlation Analysis have been used. $p<0.05$ has been agreed as the value of statistical sifnificance. 579 (%82.7) people in the study -group are female and 121 (%17.3) people in it are male. The average of their age is 20.14± 1.76 years (min:17,max:26). It has been established that the students in the type of A at the department of midwifery have much more addiction to the cellular phone ($p<0.05$ for each one). As the time of daily cellular phone use has increased, the level of addiction has increased. Also, it has been established that there is a negative correlation between addiction to cellular phone and academic-success and also a positive correlation between addiction to cellular phone and the level of depression. ($p<0.05$ for each one). Calling family members (%29.5) and sending text messages (%24.0) are the primary reasons to use cellular phone.Addiction to cellular phone among College students is a serious health-problem.The more the addiction has increased the more academic-success has decreased and intensity of depressıon has increased.

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Keywords: addiction to cellular phone ,depression, college students;

1. Introduction

Considering the world of developing information and communication technologies, we see that mobile phone use in our daily lives has a substantial degree of importance. Mobile phones, used intensively by every age group, bring about lots of difficulties together with the facilities they already offer. Having become an indispensable habit among adults for a long time, mobile phone use seems to establish its effectiveness in the lives of adolescents as well. This habit is also observed intensely among the university students. When we add the fact of

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living away from their families on economic and social issues they have to cope with, we can understand why their mobile phone use is common. Moreover, not having a clear objective due to the period they are in and that they lead a life with full of obscurity and stress increase their use of mobile phone because it is important for them to communicate with their friends and families (Carbonelli et al, 2009). Mobile phone has recently become an indispensable tool with such numerous functions as internet connection, sending e-mail, calculating, playing video games, camera, listening to music. An essential communication tool in our daily lives, mobile phone affects human relationships and interactions in many ways directly and indirectly (Chen & Katz 2009). Mobile phone, with its rapid development and wide-scale use, has largely involved the communication and interaction network of business and private life. Tomée et al. (2011) report that the use of information and connection technology (ICT-Information and Communications Technology) and increase in the frequency of mobile phone use cause mental health problems among university students. Excessive and problematic mobile phone use causes dependence (Ahmed, Qazi 2011 & Walsh et al, 2008).

In clinical applications, there are basically two types of dependence: behavioral and physical dependence. Behavioral dependence is known as the activities including substance search and findings about the existence of pathological usage features while physical dependence is generally the existence of tolerance and abstinence. According to DSM-IV, behavioral addictions, non-chemical and looking like habits, are defined as impulse control disorders (Kaplan, Sadock 2000 & Griffiths 1999).

One of the non-chemical behavioral addictions is the technological dependence, based on the human-machine interaction. Technological dependence might be in the form of a passive dependency like watching television or it might be an active dependency such as playing computer games. As is the case for alcohol-drug addictions, behavioral addictions also have characteristics like preoccupation, mood instability, tolerance, abstinence, interpersonal conflicts and recurrence, which are the main components of physical and psychological addictions. Behaviors that meet these criteria are defined as 'dependence' (Griffiths 1995).

In the studies (Dixit et al. 2010 & Yen et al. 2009& Sánchez et al. 2009) carried out, it has been reported that dependence on mobile phones is between 18.5% and 48.9%. Researchers think that problematic mobile phone use is worrying in terms of psychological and behavioral aspects (Dixit et al. 2010). In some studies, it has been reported that problematic mobile phone use causes various mental disorders particularly like depression, anxiety, sleep disorders (Coutinho et al, 2008 & Thomée et al, 2007). Depression is a syndrome with symptoms such as slowdown in thought, speech and movement, worthlessness, smallness, weakness, reluctance, pessimism, suicidal thoughts and feelings and slowdown in physiological functions in a mood of deep sadness. This syndrome involves a lot of symptoms regarding cognitive and emotional areas, starting with mild levels and progressing into severe levels (Koroglu 2001).

This study aims at determining the level of dependence on mobile phone among the students of Eskisehir Osmangazi University School of Health, examining some related factors and evaluation the relationship between dependence and the level of depression.

2. Materials and Methods

2.1. Participant:

The study is a cross-sectional survey carried out on the students in Eskişehir School of Health between 01 November and 31 December 2012. In Eskişehir School of Health, which provides education and training within Eskişehir Osmangazi University, 458 (55.1%) students in the Department of Nursing, 250 (30.1%) students in the Department of Midwifery and 123 (14.8%) students in the Department of Management in Health Care Institutions, for a total of 831 students are studying (Eskisehir Osmangazi University Student Affairs). Study

group consists of 700 students (84.2%). 390 of whom (55.7%) are from Nursing, 206 of whom (29.4%) are from Midwifery, 104 of whom (14.9%) are studying in the Department of Health Institutions Management schools.

2.2 Instruments:

By utilizing the literature for the purposes of this study (Yen et al. 2009 & Kawasaki et al. 2006 & Thomée et al, 2011) questionnaire forms involve the students' socio-demographic characteristics (section, class, gender, age, family type, family income level, residence, smoking and alcohol habits, personality type), some of the factors thought to be associated with the use of phones (mobile phone presence, the age of first mobile phone use, duration of daily use of mobile phone, causes of mobile phone use), Problematic Mobile Phone Use Scale and the questions about Beck Depression Inventory.

In this study, after obtaining permission from the management of college to collect data, students were gathered in their classes. Their verbal consents were taken after being informed about the subject and purpose of the study. The pre-prepared questionnaires were filled out by the students themselves under supervision. This process took about 20-25 minutes. Then, their height is measured with a tape and their weight is measured by the household type weighing machine. 131 students (15.8%), some of whom were not in school and the rest of whom did not agree to participate in the study, were excluded from the study. In the data collection process, it was acted in accordance with the rules of the Declaration of Helsinki.

In our study, in order to assess the level of dependency on mobile phone, Problematic Mobile Phone Use Scale was used. Developed by Bianchi and Phillips (2005), the validity and reliability of Problematic Mobile Phone Use Scale was conducted by Şar and Işıklar (2012) in Turkey. The scale consisted of 27 questions with five point likert scale. Options are evaluated in this way: "not describe me" 1 point, "describes me a bit" 2 points "describes me pretty well" 3 points "describes me well" 4 points and "describes me very well" 5 points. Scores range from 27 to 135 and it means that the higher the score is, the higher the level of dependence on the mobile phone is.

Beck Depression Inventory was used in the assessment of depression. The BDI was developed by Beck et al. in 1961 and later modified by Hisli in 1989 to suit the Turkish culture and norms. The scale includes 21 questions of four options. The answer for each item was evaluated as 0, 1, 2, and 3 points. The lowest number of points was accepted as '0 'and the highest '63', with a cut-off point of 17. In accordance with implementation and evaluation format, patients were asked to mark the appropriate options for them over the last two weeks. In this study, family income status was defined as bad, middle and good according to the students' own perceptions.

Those who smoke at least one cigarette per day were considered smokers (Tolonen, Wolf, Jakovljevic, Kuulasmaa 2002). In the current study, alcohol consumers were evaluated as those who had consumed at least one standard drink per week (one glass of raki / 1 cup vodka 1 cup gin / one glass of wine or one large glass of beer) (2012). Those with a Body Mass Index of 25 kg/m2 were considered as overweight / obese.

The data obtained were evaluated in IBM SPSS (version 20.0) statistical package program. For analysis, Chi-square test, Mann-Whitney U test, Kruskal-Wallis test and Spearman correlation analysis were used. Statistical significance value was considered as $p < 0.05$.

3. Findings

579 (82.7%) of the students in the study group were female, and 121 (17.3%) were male. Their ages ranged from 17 to 26 and the average was 20.14 ± 1.76 years. 390 of the students (55.7%) were studying in nursing, 206 of them (29.4%) in midwifery and 104 of them (14.9%) were studying in the management of health

institutions. Scores obtained from Problematic Mobile Phone Use Scale ranged from 27 to 135 and the average score was 57.17 ± 22.75. According to certain characteristics the distribution of the average scores that the study group obtained from Problematic Mobile Phone Use Scale is given in Table 1.

Table 1. Distribution of the average scores, according to certain characteristics, which the study group obtained from Problematic Mobile Phone Use Scale

Socio-demographics	n	Score of Problematic Mobile Phone Use Scale Median(min-max)	Test value z/KW; p	Multiple Comparisons	p
Department					
Nursery (1)	390	48.0 (27.0-135.0)		1-2	0.000
Midwifery (2)	206	53.0 (31.0-135.0)	15.295;	1-3	1.000
Management of Health Ins. (3)	104	47.5 (27.0-135.0)	0.000	2-3	0.023
Class					
1	224	49.0 (31.0-135.0)		-	-
2	169	51.0 (27.0-135.0)	7.163;	-	-
3	154	52.0 (29.0-135.0)	0.067	-	-
4	153	48.0 (29.0-135.0)		-	-
Gender					
Female	579	50.0 (27.0-135.0)	0.485;	-	-
Male	121	48.0 (27.0-135.0)	0.628	-	-
Age Group					
≤18	142	51.0 (31.0-117.0)		-	-
19-20	291	50.0 (27.0-135.0)	1.642;	-	-
≥21	267	48.0 (29.0-135.0)	0.440	-	-
Family Type					
Nuclear family	624	50.0 (27.0-135.0)		-	-
Extended family	56	50.5 (27.0-131.0)	0.361;	-	-
Broken family	20	48.0 (34.0-124.0)	0.835	-	-
Family Income Statue					
Bad	45	48.0 (31.0-135.0)		-	-
Middle	546	50.0 (27.0-135.0)	0.270;	-	-
Good	109	49.0 (29.0-131.0)	0.874	-	-
Residence					
House	105	50.0 (31.0-124.0)		-	-
Dormitory	207	49.0 (27.0-131.0)	0.474;	-	-
Apart hotel	315	50.0 (27.0-135.0)	0.925	-	-
Other	73	52.0 (29.0-135.0)		-	-
Smoking State					
Smoker	124	50.5 (31.0-135.0)	0.629;	-	-
Non-smoker	576	49.5 (27.0-135.0)	0.530	-	-
Alcohol Consumption					
No	618	50.0 (27.0-135.0)	0.015;	-	-
Yes	82	52.0 (29.0-135.0)	0.988	-	-
Overweight/Obesity					
No	605	50.0 (27.0-135.0)	1.462;	-	-
Yes	95	49.0 (29.0-121.0)	0.144	-	-

Personality type					
A	368	52.0 (27.0-135.0)	2.891;	-	-
B	332	47.0 (27.0-135.0)	0.004	-	-
Total	**700**	**50.0 (27.0-135.0)**	-	-	-

All the participants in the study group use mobile phones and have their own phones. The distribution of average points, according to the age of first mobile phone use and daily mobile phone use durations, which the students obtained from Problematic Mobile Phone Use Scale is provided in Table 2.

Table 2. The distribution of average points, according to the age of first mobile phone use and duration of daily mobile phone use, which the students obtained from Problematic Mobile Phone Use Scale

	n	**Score of Problematic Mobile Phone Use Scale** Median (min-max)	**Test value** z/KW; p	**Multiple Comparisons**	**P**
Age of first mobile phone use (year)					
≤13	167	51.0 (31.0-135.0)		-	-
14	148	50.0 (27.0-135.0)	4.016;	-	-
15	161	49.0 (27.0-135.0)	0.260	-	-
≥16	224	49.0 (29.0-131.0)		-	-
Duration of daily mobile phone use (hour)					
≤1 (1)	189	44.0 (27.0-135.0)		1-2	0.719
2-3 (2)	252	47.0 (29.0-135.0)		1-3	0.000
4-5 (3)	133	53.0 (32.0-135.0)	58.161;	1-4	0.000
≥6 (4)	126	62.5 (31.0-135.0)	0.000	2-3	0.000
-	-	-		2-4	0.000
-	-	-		3-4	0.000
Total	**700**	**50.0 (27.0-135.0)**	-	-	-

Among the main causes of mobile phone use are calling family members (29.5%) and messaging (24.0%). As a person uses a mobile phone for more than one reason, numbers and percentages were calculated according to reasons, not the person. In our study, the reasons why students use mobile phones are given in Table 3.

Table 3. Reasons why students use mobile phones

Reasons to use mobile phones	**n**	**%**
Calling family members	492	29.5
Calling friends	292	17.5
Messaging	400	24.0
Internet use	168	10.1
Following the news	64	3.8
Playing games	47	2.8
Listening to music	198	11.9
Other	6	0.4
Total	**1667**	**100.0**

*Numbers and percentages were evaluated according to reasons.

Academic grade point average of the study group was 2.48 ± 0.48 points (min: 1.18, max: 3.81). A negative correlation was found between the points students got from Problematic Mobile Phone Use and their academic grade point average (r = -0,117, p = 0.010).

Points that the study group obtained from Beck Depression Scale ranged from 0 to 63 and the average score was 11.80 ± 10.61. A positive correlation was determined between the scores obtained from Problematic Mobile Phone Use Scale and the scores of Beck Depression Scale (r = -0,256, p = 0.000).

4. Discussion

It has been determined in our study that the scores students obtained from Problematic Mobile Phone Use Scale ranged from 27 to 135 and the average score was 57.17 ± 22.75. In some studies, the scores obtained from mobile phone addiction scale are reported to vary between 16.5-33.2 points (Kawasaki et al, 2006 & Ezoe et al, 2009 & Toda et al, 2004). Among the reasons why the students got higher points from the scale in our study could be the difference in diagnostic criteria for dependence on mobile phone and the cultural and social differences of communities.

A significant difference between male and female students in the study group could not be found in terms of mobile phone addiction level (p> 0.05). Similar results have been reported in the various studies (Ahmed, Qazi 2011& Dixit et al, 2010& Yen et al, 2009).

In this study, there was no difference between age groups in terms of the level of mobile phone addiction (p> 0.05). It has been reported in similar studies that there is no difference among the age groups in terms of the level of dependency on mobile phones (Sánchez et al, 2009 & Ezoe et al, 2009). One of the reasons why there is no difference among the age groups in terms of the level of mobile phone addiction might be the fact that the students are in similar ages.

In our study, a relation between family type and family income with mobile phone dependence level could not be found (each p> 0.05). Results supporting our study have been found in similar studies. (Ahmed, Qazi 2011 & Prezza et al, 2004) It is possible for individuals with a large family to talk more on the mobile phone due to the number of family members. Furthermore, individuals with high socio-economic levels are expected to have mobile phones and their dependency level is expected to be high as a result of wide use of mobile phone. But now dependency on mobile phone may not be affected by income status because mobile phone operators provide their services at low prices with the campaigns they have made.

A difference could not be found in the study group between those who have the habit of smoking and alcohol consumption and those who do not in terms of mobile phone addiction level. (for each, p> 0.05). In some studies conducted, those with the habit of smoking and alcohol consumption are reported to have a higher level dependency on mobile phone (Yen 2009 & Koivusilta et al, 2005& Todaet al, 2006). One of the reasons why there is no relation between smoking and alcohol consumption and dependency on mobile phone could be that the number of those who have the habit of smoking and alcohol consumption is low.

In the study, there is no relation between the overweight / obese and those who are not in terms of the level of dependency on mobile phones (p> 0.05). In a study conducted by Lajunen et al. (2007) it was reported that a positive correlation was detected between dependency on mobile phone and body mass index.

Students who have A type of personality were found to have higher level of dependence on mobile phone ($p < 0.05$). The reason might be that those with A type personality are hasty in their relationships, jobs and decisions and they are open to communication and more extroverted.

Starting to use mobile phone at an early age leads to a longer period of time using it in human life. It is possible that as the time for mobile phone use increases, the level of dependency increases as well. However, in our study a difference could not be detected between the age of first mobile phone use and level of dependency ($p > 0.05$). In this study, as the time for daily use of mobile phone increases, the level of dependence on mobile phone increases as well. ($p < 0.05$).

More than half of the participants in the study group stated that the primary reason to use mobile phone is calling and messaging with their family members. Toda et al. (2006) detected in their study that messaging and connecting to internet are the most common cause of using mobile phone.

In our study, it has been determined that academic failure increases as the level of mobile phone dependency increases ($p < 0.05$). In a similar study conducted by Sanchez et al, (2009) failure in school is reported to increase as the level of dependence on the mobile phone rises. This case might stem from the fact that students with the dependency on mobile phone waste their time on such activities as talking on the phone, sending SMS, connecting to internet, playing games, listening to music and that they do not have time to fulfill their responsibilities in their daily lives.

The severity of depression is detected to increase as the level of dependency on mobile phone increases among the students ($p < 0.05$). Considering the previous studies carried out on this matter, a similar consequence is seen. (Chen, Katz 2009 & Thomee et al, 2011) Using a mobile phone may take people away from the social world with opportunities the device provide such as taking pictures, connecting to internet, playing games and getting involved in many virtual activities offered on the net. While all those activities given offer a big opportunity to socialize on the surface, they actually could insert people into a large virtual world. When we look from their point of view, we can say that adolescents, whose emotional and cognitive development has not yet been completed, move away from the real world and establish a virtual world for themselves. Moreover, with the extent of their absorption in the charm of this virtual world, they move away from their families and friends and get more depressed. In addition to these, within the virtual world of mobile phones, the fact that they get depressed is an expected situation since they express their thoughts and feelings in only a few words and a shallow way and cannot express themselves properly. All this shows that the longer adolescents stay in the virtual world that they have established for themselves, the more depressed they will be in this situation.

5. Limitations

That the study was a cross-sectional survey study conducted in a single university only on the students of health school and that the scales used could not make definitive diagnosis might be counted as the limitations of this study.

6. Conclusions and recommendations

In this study, it is detected that mobile phone dependency among university students is a major health problem and as the addiction increases, academic achievement decreases and the severity of depression increases. It would be beneficial to direct the students, whose mobile phone dependency are identified, to specialist doctors in order to achieve accurate diagnosis and treatment and also occasional screening for early diagnosis and informing the students about mobile phone use in a controlled way might be useful.

References

Carbonelli X, Guardiola E, Beranuy M, Bellés A. (2009) A bibliometric analysis of the scientific literatüre on internet, video games, and cell phone addiction. J Med Libr Assoc, 97(2)

Chen Y F, Katz J. (2009) Extending family to school life: college students use of the mobile phone. Human-Computer Studies, vol.67.

Thomee S, Härenstam A, Hagberg M. (2011) Mobile phone use and stress, sleep disturbances, and symptoms of depression among young adults – a prospective cohort study. BMC Public Health, 11:66.

Ahmed I, Qazi T F. (2011) Mobile phone adoption & consumption patterns of university students in Pakistan. International Journal of Business and Social Science, 2(9): 205-213.

Walsh S P, White K M, Young R M. (2008) Over-connected? A qualitative exploration of the relationship between Australian youth and their mobile phones. Journal of Adoleslence, 31:77-92.

Kaplan & Sadock (editors). (2000) Comprehensive Textbook of Psychiatry, 7th edition, Philadelphia PA,Williams and Wilkins, 924-939

Griffiths M. (1999) Internet Addiction: Fact or Fiction? The Psychologist 12:246-250.

Griffiths MD. (1995) Technological addictions. Clinical Psychology Forum , 76:14-19.

Dixit S, Shukla H, Bhagwat A K, Bindal A, Goyal A, Zaidi K A.(2010) A study to evaluate mobile phone dependence among students of a medical college and associated hospital of central india, Indian Journal of Community Medicine, Vol 35/Issue 2/April.

Yen C F, Tang T C, Yen J Y, Lin H C, Haung C F, Liu S C, Ko C H. (2009) Symptoms of problematic cellular phone use, functional impairment and its association with depression among adolescents in Southern Taiwan. Journal of Adolescence, 32: 863-873.

Sánchez M, Martinez M, Otero A. (2009) Factors Associated with cell phone use in adolescents in the community of Madrid (Spain) Psychology & Behavior, Vol 12, Number 2

Coutinho LMS, Scazufca M, Menezes PR. (2008) Methods for estimating prevalence ratios in cross-sectional studies. Rev Saúde Pública, 42(6):992-998.

Thomée S, Eklöf M, Gustafsson E, Nilsson R, Hagberg M. (2007) Prevalence of perceived stress, symptoms of depression and sleep distubances in relation to information and communication technology (ICT) use among young adults- an explorative prospective study. Computers in Human Behavior, 23(3):1300-1321.

Amerikan Psikiyatri Birliği. Ruhsal Bozuklukların Tanısal ve Sayımsal El Kitabı, Yeniden Gözden Geçirilmiş 4. Baskı (DSM-IV-TR). (E.Köroğlu, Çev.) Ankara, Hekimler Yayın Birliği. 2001.

Kawasaki N, Tanci S, Ogata F, Burapadaja S, Loetham C, Nakamura T, Tanada S. (2006) Survey on cellular phone usage on students in Thaliand. J Physiol Anthropol, 25(6): 377-382.

Thomée S, Härenstam A, Hagberg M. (2011) Mobile phone use and stress, sleep disturbances, and symptoms of depression among young adults – a prospective cohort study. BMC Public Health, 11:66.

Bianchi A, Phillips JG. (2005) Psychological predictors of problem mobile phone use. Journal of Cyberpsychol Behav, 8 (1): 39-51

Şar AH, Işıklar A. (2012) Problemli mobil telefon kullanım ölçeğinin Türkçeye uyarlaması. Int J Human Sci, (9) 2: 264-75

Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. (1961) An inventory for measuring depression. Arch Gen Psychiatry, 4: 561-71.

Hisli N. (1989) A study of the validity of the Beck Depression Inventory. Turkish J Psychol. 22 (6):118-26.

Tolonen H, Wolf H, Jakovljevic D, Kuulasmaa K and the European Health Risk Monitoring Project. Review of surveys for risk factors of major chronic diseases and comparability of the results. European Health Risk Monitoring (EHRM) Project. October, 2002. Available at: URL: http://www.ktl.fi/publications/ehrm/product1/title.htm. URN:NBN:fi-fe20021442.

Ozfatura N. Yesilay Alkol Raporu, (2009) Available at: http://yesilay.org.tr/yesilay.asp?p=dokuman&id=70. Accessed on Dcember 22, 2012.

Yetişkinlere yönelik testler ve anketler. (2012) http://www.hiperaktivite.net/hah5_3.htm (available date: 25-11

Ezoe S, Toda M, Yoshimura K, Naritomi A, Den R, Morimoto K. (2009) Relationships of personality and lifestyle with mobile phone dependence among female nursing students. Social Behavior and Personality, 37(2), 231-238

Toda M, Monden K, Kubo K, Morimoto K. (2004) Cellular phone dependence tendency of female universty students. Nihon Eiseigaku Zasshi, 59(4):383-6

Prezza M, Pacilli M G, Dinelli S. (2004) Loneliness and new Technologies in a group of Roman adolescents. Computers in Human Behavior, 20(5):691-709.

Koivusilta L, Lintonen T, Rimpelä A. (2005) Intensty of mobile phone use and healthy compromising behaviours: How is information and communication technology connected to health-related lifestyle in adolescence? Journal of Adolescence, 28:35-47

Toda M, Monden K, Kazuki K, Marimoto K. (2006) Mobile phone dependence and health-related lifestyle of universty students. Social Behavior and Personality, 34(10):1277-1284

Lajunen H R, Keski-Rahkonen A, Pulkkinen L, Rose R J, Rissanen A, Kaprio J. (2007) Are computer and cell phone use associated with body mass index and overweight? Apopulation study among twin adolescents. BMC Public Health, 7,24.