Psychometric Properties of Smartphone Addiction Questionnaire (SPAQ) among Sultan Qaboos University Undergraduate Students

Hafidha S. Al-Barashdi*
Sultan Qaboos University, Oman

Abdelmajid Bouazza
Sultan Qaboos University, Oman

AbdullQawi Al Zubaidi
Sultan Qaboos University, Oman

Submitted: 24/6/2014 Revised: 3/8/2014 Accepted: 4/8/2014

The aim of this study was to identify the psychometric properties of a smartphone addiction questionnaire. It explored the structure of the questionnaire: smartphone usage, the level of addiction to smartphones' different activities and applications, and the level of smartphones' addiction symptoms appearance. The dimensional structure of the questionnaire was investigated with a sample of 140 SQU undergraduates (37.1% males and 62.9% females). Based on the factor analysis results, the questionnaire consisted of five factors: disregard of harmful consequences, preoccupation, inability to control craving, productivity loss and feeling anxious and lost. The internal consistency and concurrent validity of SPAQ were verified (Cronbach's alpha= 0.76). SPAQ and its factors were significantly correlated with smartphone addiction scale (SAS). The reliability of SPAQ has been tested using test-re-test method and revealed a significant correlation of 0.67 between the two applications.

Keywords: psychometric properties, smartphone addiction, SQU, Oman

الخصائص السيكومترية لاستبيان إدمان الهاتف الذكي لدى طلبة جامعة السلطان قابوس

حفيظة سليمان البراشدي*
جامعة السلطان قابوس، سلطنة عمان

عبد المجيد بوعزة
جامعة السلطان قابوس، سلطنة عمان

عبد القوي الزبيدي
جامعة السلطان قابوس، سلطنة عمان

هدفت الدراسة الحالية إلى التعرف على الخصائص السيكومترية لاستبيان إدمان الهاتف الذكي. كما سعت الدراسة إلى البنية العاملية للاستبيان: استخدام الهاتف الذكي، مقدار الإدمان، وأعراض إدمان الهاتف الذكي. تم اختبار البنية العاملية على عينة من طلبة جامعة السلطان قابوس (ن = ١٤٠، ٣٧,١٪ ذكور). في ضوء نتائج التحليل العاملي تبين أن الاستبيان يحتوي على خمسة عوامل: عدم الاكتراث بالتبعات الضارة، والانهماك، وعدم القدرة على ضبط الرغبة، والشعور بالقلق والضياع. تم التحقق من الاتساق الداخلي والصدق التلازمي للمقياس حيث بلغت قيمة كرونباخ ألفا ٠,٧٦ كما ارتبطت درجات الاستبيان مع درجات إدمان الهاتف الذكي بدرجة دالة إحصائياً. وبلغ معامل استقرار الاستبيان ٠,٧٧

الكلمات المفتاحية: الخصائص السيكومترية، إدمان الهاتف الذكي، جامعة السلطان قابوس، سلطنة عمان.

*p012307@squ.edu.om

The smartphone has changed the ways in which people communicate with others, find information, have fun and manage their everyday lives (Park, Kim, Shon & Shim, 2013). As a result, smartphone use is rapidly spreading world-wide. In fact, the global mobile phone market now stands at approximately 6.8 billion subscribers (International Telecommunication Union, 2013), with more than 1.08 billion being smartphone users. Oman is no exception, according to the Telecommunication Regulatory Authority (TRA), mobile phone penetration rate (the number of subscriptions per 100 people) was 190.29% at the end of Q4 2012 (TRA, 2012).

While smartphone use has been increasing across economic and age sectors, university students have been seen as one of the most important target markets and the largest consumer group of smartphone services (Head & Ziolkowski, 2012). Hong, Chiu and Huang (2012) argue that mobile phones are popular among university students because they increase their social communication and expand their opportunities for making social relationships. However, although this expanding use of Smartphones among university students has provided them with an easy way of communication, Smartphones can also lead to addiction (Hassanzadeh & Rezaei, 2011).

"Addiction" is defined in the dictionary as: (1) a functional abnormality of the body caused by food or pharmaceutical toxins; (2) a pathologic condition that one cannot tolerate without the continuous administration of alcohol or drugs; and (3) the status of not being able to rationally judge or distinguish due to certain ideas or objects. Smartphone addiction is a type of behavioral addiction that can be destructive to social lives outside the smartphone devices. Although it is not considered officially as a type of addiction, it is now prevalent worldwide, as it causes trauma and anxiety, among other symptoms.

There is no consensus among the previous studies regarding the definition of smartphone addiction because of: a) The variety of addiction symptoms that are associated with smartphone use; b) The wide variety of smartphone new functions; c) The different problematic outcomes that are associated with smartphone addiction (Takao, Takahashi & Kitamura, 2009).

However, in contrast to material-related addictions, smartphone addiction may not produce observable signs or symptoms, such as physiological indications of cravings and the addicted individual may appear to be working in a normal and socially acceptable manner (Griffiths, 1996; Lemon, 2002). For Griffiths (1999) and Shaffer (1996), technological addictions involve extreme human-machine interactions which are developed when people become dependent on the device to reduce the negative mood states or to increase the positive consequences.

Surprisingly, most studies on mobile phone addiction seem to focus either on the amount of time allocated for the smartphone use by counting calls sent, calls received, messages sent, and messages received, or by counting the frequency of appearance of smartphone addiction symptoms, whereas both are needed.

Therefore, this study defines smartphone addiction as a type of behavior which associated by group of negative symptoms of: Disregard of harmful consequences, preoccupation, inability to control craving, productivity loss and feeling of anxiety and loss. This addiction can be measured by calculating three indications (the amount of time allocate for the use of Smartphones, the amount of money spend on Smartphone use, the frequency of appearance of smartphone addiction symptoms).

Although there were many studies developed scales to measure mobile phone/SMS addiction (e.g. Ahmed, Qazi&Perji, 2011; Bianchi & Phillips, 2005; Billieux, Linden & Rochat, 2008; Chóliz, 2012; Chung, 2011; Hong, Chiu & Huang, 2012; Igarashi, Motoyoshi, Takai& Yoshida, 2008; Krajewska-Kułak et al., 2012; Park, 2005; Pawłowska & Potembska, 2011; Perry & Lee, 2007; Szpakow, Stryzhak & Prokopowicz, 2011; Takao et al., 2009; Walsh, 2009).

Few studies developed scales to measure smartphone addiction. For example, in Korea, Kwon et al. (2013) developed a scale of smartphone addiction. It is a self-diagnostic scale based on the Korean self-diagnostic program for Internet addiction that can distinguish Smartphone addicts. Subjects were divided into three groups: a high-risk group, a low- to medium-risk group and the general group. Findings showed that smartphone addiction rates of the high- risk group and low-to me-

dium-risk group were 2.2 and 9.3% respectively in adolescents and 1.0 and 6.7% in adults. Based on factor analysis results, the subscale for the smartphone Addiction Scale (SAS) was divided as follows: Daily-life disturbance, positive anticipation, withdrawal, cyberspace-oriented relationship, overuse and tolerance.

Likewise, in China, Casey (2012) adapted a scale to measure smartphone addiction among university students. It identified addiction symptoms that were uniquely associated with smartphone use. Exploratory factor analysis of the smartphone Addiction Scale identified five symptoms which were: disregard of harmful consequences, preoccupation, inability to control craving, productivity loss and feelings of anxiety and loss.

The complexity of smartphone addiction is reflected, among other things, in the levels on which it has been studied, and the kind of methods by which it has been investigated. For this study we developed a questionnaire to measure the level of Smartphone addiction among SQU undergraduate students by assessing: 1) The amount of time they allocate to the use of Smartphones, 2) The amount of money they spend on the performance of a number of activities through the use of Smartphones, 3) The frequency of appearance of Smartphone addiction symptoms. Based on the overall average, the users classified it into three levels (casaual, moderate and heavy).

METHOD

Sample

Table 1 shows that the sample of this study consisted of (140) undergraduate students at Sultan Qaboos University. It included 37.1% males, 62.9% females aged between 18 and 27 years. They were sampled randomly from different colleges at Sultan Qaboos University (60.7% physical science students, 39.3% social science and Humanities students).

Instruments and procedures

Two instruments were employed in this study: a) Smartphone Addiction Questionnaire (SPAQ), b)Smartphone Addiction Scale (SAS). Below is a description of these instruments along with their administration procedures.

- **Smartphone addiction questionnaire (SPAQ)**: This questionnaire was adapted and modified from those in: (Walsh, 2009; Casey, 2012). Then, the contents of the questionnaire items was validated and its translation has been checked by group of referees from the Department of Information Studies at the College of Art and Social Sciences, and from the Departments of Psychology and Educational Technology at the College of Education. The questionnaire explored the level of Smartphone addiction among university students through three parts: the level of Smartphone usage, the level of addiction to Smartphones' different activities and applications, and the level of Smartphones' addiction symptoms appearance, as follows:

1. ***Level of smartphone usage***: Five questions regarding Smartphone use including the average number of calls sent, calls received, texts sent and texts received every day to measure the level of use as identified by (Walsh, 2009).The purpose of these questions are to identify the amount of time they allocate for the use of Smartphones and the amount of money they spend on the performance of a number of activities through the use of Smartphones (e.g. "How many calls would you make on your mobile phone per day?").

   Level of addiction to smartphone's activities and applications : Seventeen items were included to cover different smartphone activities and applications. The purpose of these items are to identify the type of addiction by recognizing the most addictive Smartphone's activities and applications among users (e.g., How often do you use your Smartphone to do the following: Watch videos, vote on a television programs/enter a competition, set an alarm/reminder, use the calculator, take photos, ..etc.).

Table1
Distribution of the sample by gender and field of study

Gender	Field study				Total	
	Physical Science colleges		**Social Science and Humanities colleges**			
	N	%	N	%	N	%
Male	31	22.1%	21	15%	52	37.1%
Female	54	38.6%	34	24.3%	88	62.9%
Total	85	60.7%	55	39.3%	140	100%

2. ***Level of smartphone addiction symptoms* appearances**: Seventeen items were included to cover the symptoms of Smartphone use distributed in a five-factor of Smartphone addiction profile as identified by Casey (2012). These factors were: disregard of harmful consequences (items: 1, 2, 3, 4), preoccupation (items: 7, 9, 10), inability to control craving (items: 5, 6, 11, 12), productivity loss (items: 13, 14, 15) and feeling anxious and lost (items: 8, 16, 17). The purpose of these items is to identify the frequency of appearance of Smartphone addiction symptoms among users.

- **Smartphone addiction scale (SAS)**: To verify the concurrent validity of the present study's Smartphone Addiction Questionnaire (SPAQ), the Smartphone Addiction Scale (SAS) by Kwon et al. (2013) was used. This scale identifies the subjective thoughts of the participants regarding the seriousness of their addiction. It consists of (48) items divided into seven subscales: daily-life disturbance, disturbance of reality testing, positive anticipation, withdrawal, cyberspace-oriented relationship, overuse and tolerance. Each item was assigned a five-point Likert-type scale. The internal-consistency (Cronbach's alpha) was 0.97.

Both questionnaires were administrated to the sample in the first application. Then the first questionnaire was administered to the same sample 2 weeks later.

Statistical analysis

Data were analyzed using SPSS. Cronbach's alpha coefficients and item total score correlations were computed for the reliability of the scale. Test–re-test correlation was calculated with Pearson's correlation method. For the validity of the scale, correlations between the scales were calculated with Pearson's correlation method. To evaluate the factor structure of the SPAQ, principle components factor analysis was used. The significance level was accepted as $p \leq 0.05$ throughout the analyses.

RESULTS and DISCUSSION

Descriptive statistics

This study measured the level of smartphone addiction among SQU undergraduates by assessing three types of Smartphone addiction indicators is shown in Table 2 Figure 1 in appendix. The casual level of smartphone addiction was the most frequent level (42.3%), followed by the heavy level (30.8%) and finally the moderate level (26.8%). SQU undergraduates at casual level of Smartphone addiction spend 1 yo 10 OR on their phone monthly, send and receive 1to 4 calls and messages daily, and show the least level of addiction symptoms. At the moderate level of Smartphone addiction they spend 11 to 20 OR on their phone monthly, send and receive 8 to 10 calls and messages daily and show a moderate level of addiction symptoms. But at the heavy level of smartphone addiction they spend more than 20 OR on their Smartphone monthly, send and receive more than 10 calls and messages daily and showed the highest level of addiction symptoms.

Validity findings

In this study, the following three methods were used to assess the validity of the Smartphone Addiction Questionnaire (SPAQ):

Factor analysis: Principal component factor analysis has been used to determine the potential groupings of the 17 items of Smartphone Addiction Questionnaire. Varimax rotation has been used to better account for expected correlations among potential factors. The factor loads that were less than 0.4 were ignored. Five factors emerged with eigen values greater than 1.0, explaining 61.3% of the total variance

Table 2
Percentages of smartphone addiction levels' among SQU undergraduate students

Addiction levels		Smartphone addiction indicators						
		Money spent	Calls send	Calls received	Messages sent	Messages received	Addiction symptoms	Average
Casual	F	100	123	113	8	6	6	59.3
	P	71.4%	87.9%	80.7%	5.7%	4.3%	4.3%	42.3%
Moderate	F	32	14	23	19	10	127	37.5
	P	22.9%	10%	16.45	13.6%	7.1%	90.7%	26.8%
Heavy	F	8	3	4	113	124	7	43.2
	P	5.7%	2.15%	2.8%	80.7%	88.6%	5%	30.8%
Total	F	140	140	140	140	140	140	140
	P	100%	100%	100%	100%	100%	100%	100%

Note: F= Frequencies, P= Percentage.

Table 3
Factor analysis of smartphone addiction questionnaire

Items	Factors				
	1	2	3	4	5
14- I was busy using my smartphone in a way that affect my social responsibilities	.796				
13- The quality of discharging my duties decreased because I am busy in using my smartphone all times	.741				
12- The time that I spend using my smartphone is not enough	.583				
17- I feel lost and anxious when I don't have my smartphone with me		.744			
15- I use my smartphone to escape from facing difficult situations		.724			
16- I feel upset when forced to shut down my smartphone		.716			
8- I feel that I lack something when I'm not able to use my smartphone		.631			
1- I often late for my lectures because I was occupied using my smartphone			.798		
6- I feel like not being able to control my desire to use my smartphone			.609		
2- My class grade declined as a result of the time I spend in using my smartphone			.585		
5- I tried to reduce the time that I usine my smartphone but I failed			.577		
4- I hide from others the amount of time I spend using my smartphone			.422		
10- I find myself use my smartphone for a longer time than planned				.791	
11- People tell me that I spend a lot of time using my smartphone				.580	
9- I improve my mood and get rid of depression when I use my smartphone				.574	
7- My mind keeps busy with my smartphone even when I don't use it					.841
3- More than once I have been in trouble because I didn't switched on my smartphone during lectures					.424
Eigen value	2.45	2.45	2.36	1.91	1.24
Variance (61.3%)	14.43	14.42	13.93	11.24	7.30

(Table 3). The first factor was "productivity loss". This consisted of three items reflecting how smar tphone addiction causes many problems that ends up with loss of productivity in the personal and professional lives of university students. This factor had an eigen value of 2.45 and explained 14.43% of the total variance. The second factor was "feeling anxious and lost". This factor had an eigen value of 2.45 and explained 14.42% of the total variance. The third factor was "disregard of harmful consequences". This factor had an eigen value of 2.36 and explained 13.93% of the total variance. The fourth factor was "preoccupation". This factor had an eigen value of 1.91 and explained 11.24% of the total variance. Finally the fifth factor was "inability to control craving". This factor had an eigen value of 1.24 and explained 7.30% of the total variance.

Construct Validity. Gender differences was used in this study as an approach to establish construct validity of Smartphone Addiction questionnaire (SPAQ).The majority of the previous studies have shown gender differences in smartphone addictive use (e.g., Billieux et al., 2008; Chóliz, 2012;Devís-Devís et al., 2009;Pawłowska & Potembska, 2011; Turner, Love & Howell, 2008; Villella et al., 2011; Walsh, 2009). In this study, an independent t-test was used to examine whether there were gender differences in smartphone Addiction among SQU students. The results revealed that there were significant gender differences in smartphone addiction among SQU undergraduates: Males were more addicted to smartphone use than females (Table 4).

Table 4
Gender differences in smartphone addiction among SQU undergraduates

Male (n=51)		Female (n=88)		*T*	*P*
M	*SD*	*M*	*SD*		
3.49	0.91	3.29	0.66	1.5	0.030

***Note*: n= number of cases, M=means, SD=standard deviation.**

Concurrent validity: smartphone Addiction Scale (SAS) by Kwon et al. (2013) have been used to test the concurrent validity of the present study questionnaire. This questionnaires was selected because of their high level of validity and reliability. To examine the concurrent validity, the researcher correlated the respondents' mean scores on both versions. The results revealed significant correlation of (0, 778) between present study questionnaires and the SAS (Table 5).

Table 5
Concurrent validity of smartphone addiction questionnaire

	Smartphone Addiction Questionnaire (SPAQ)	Smartphone Addiction Scale (SAS)
Factors	1- disregard of harmful consequences	0.547**
	2- preoccupation	0.215*
	3- inability to control craving	0.545**
	4- productivity loss	0.576**
	5- feeling anxious and lost	0.647**
The whole questionnaire		0.700**

* p. 0.05 (2-tailed), ** p. 0.01 (2-tailed).

Reliability

To address the issue of reliability two methods were used: a) test-retest reliability, and b) Cronbach's alpha. Below is a description of these indices.

Test-Re-Test finding. The reliability of the present study questionnaire has been also tested using Test-Re-Test method using a sample of (140) SQU undergraduates. It is worth noting that the questionnaire administered to students and repeated after two weeks, then the researcher correlated the respondents' mean scores for both applications. The results revealed a significant correlation of .667 between the two applications (Table 6).

Table 6
Test-re-test reliability of smartphone addiction questionnaire

Smartphone Addiction Questionnaire		Reliability
Factors	1- disregard of harmful consequences	0.686
	2- preoccupation	0.677
	3- inability to control craving	0.806
	4- productivity loss	0.705
	5- feeling anxious and lost	0.726
The whole questionnaire		0.667

Internal consistency of the test. The reliability of the present study questionnaires have been also tested using Cronbach's alpha Coefficient. The results revealed that the present study questionnaires have high internal-consistency. Cronbach's alpha Coefficient for the first questionnaire was (0.764) (Table 7).

Table 7
Internal reliability of smartphone addiction questionnaire

Smartphone Addiction Questionnaire		Cronbach's alpha
Factors	1- disregard of harmful consequences	0.583
	2- preoccupation	0.114
	3- inability to control craving	0.730
	4- productivity loss	0.653
	5- feeling anxious and lost	0.761
The whole questionnaire		0.764

CONCLUSION

The main purpose of this study was to identify the psychometric properties of smartphone addiction questionnaire (SPAQ) among SQU undergraduates. The validity of the SPAQ scores were tested using three methods of validity. First, the factor analysis of the SPAQ indicated that many of the 17 items loaded on five factors pertaining to the negative symptoms of Smartphone addiction. These were: disregard of harmful consequences, preoccupation, inability to control craving, productivity loss and feeling anxious and lost. Second, the concurrent validity of SPAQ scores were significantly associated with the SAS. That result lends support for the concurrent validity of the SPAQ. finally, the construct validity of the questionnaire has been checked through test the gender differences in smartphone addiction among SQU undergraduates. The results reveal that there were significant gender differences in Smartphone addiction among SQU undergraduates: Males were more addicted to Smartphone use than females. This result agreed with the majority of studies that have shown gender differences in Smartphone addiction (e.g., Billieux et al., 2008; Chóliz 2012; Devís-Devís et al., 2009; Pawłowska & Potembska, 2011; Turner et al., 2008; Villella et al., 2011; Walsh, 2009).

In addition, the reliability estimates for SPAQ score were calculated using two methods: Test-retest reliability, and Cronbach's alpha. The SPAQ was both internally consistent (Cronbach's alpha 0.76) and reliable across a 2-week time period (0.66). According to these results, the psychometric properties of the SPAQ are promising.

REFERENCES

Ahmed, I., Qazi, T., & Perji, K. (2011). Mobile Phone to Youngsters: Necessity Or Addiction. *African Journal of Business Management, 5(32),* 12512-12519.

Bianchi, A., & Phillips, J. (2005). Psychological predictors of problem mobile phone use. *CyberPsychology and Behavior, 8, (1),* 39-51.

Billieux, J., Linden, M., & Rochat, L. (2008). The Role of Impulsivity in Actual and Problematic Use of the Mobile Phone. *Applied Cognitive Psychology, 22,* 1195–1210.

Casey, B. M. (2012). *Linking Psychological Attributes To Smartphone Addiction, Face-To-Face Communication, Present Absence And Social Capital*. Unpublished Master's thesis, The Chinese University of Hong Kong, Hong Kong, China.

Chóliz, M. (2012). Mobile-phone addiction in adolescence: The Test of Mobile Phone Dependence (TMD). *Prog. Health Sc.i, 2(1),* 33-44.

Chung, N. (2011). Korean Adolescent Girls Additive Use Of Mobile Phones To Maintain Interpersonal. *Social Behavior and Personality, 39(10),* 1349-1358.

Devís-Devís, J., Peiró-Velert, C., Beltrán-Carrillo, V. J., & Tomás, J. M. (2009). Screen Media Time Use Of 12-16 Year-Old Spanish School Adolescents: Effects Of Personal And Socioeconomic Factors, Season And Type Of Day. *Journal of adolescence*, *32*(2), 213–31. doi:10.1016/j.adolescence.2008.04.004

Griffiths, M. (1996). Behavioral Addiction: An Issue For Everybody? *Employee Counseling Today, 8(3),* 19-25.

Griffiths, M. (1999). Internet addiction. *The Psychologist, 12*, 246-250.

Hassanzadeh, R., & Rezaei, A. (2011). Effect Of Sex, Course And Age On SMS Addiction In Students. *Middle-East Journal of Scientific Research, 10(5*), 619-625.

Hong, F-Y., Chiu, S-I., & Huang, D-H (2012). A Model Of The Relationship Between Psychological Characteristics, Mobile Phone Addiction And Use Of Mobile Phones By Taiwanese University Female Students. *Computers in Human Behavior, 28*, 2152–2159.

Igarashi. T., Motoyoshi. T., Takai. J., & Yoshida. T. (2008). No Mobile, No Life: Self-Perception And Text-Message Dependency Among Japanese High School Students. *Computers in Human Behavior, 24,* 2311–2324.

International Telecommunication Union (2013). *Mobile-Cellular Subscriptions*. Retrieved fromhttp://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx

Krajewska-Kułak, E., Kułak, W., Stryzhak, A., Szpakow, A., Prokopowicz, W., & Marcinkowski J.T. (2012). Problematic Mobile Phone Using Among The Polish And Belarusian University Students: A Comparative Research. *Prog. Health Sci., 2(1),* 45-50.

Kwon, M., Lee, J.-Y., Won, W.-Y., Park, J.-W., Min, J.-A., Hahn, C., … Kim, D.-J. (2013). Development and Validation of a Smartphone Addiction Scale (SAS). PloS one, 8(2), 1-7. doi:10.1371/journal.pone.0056936

Lemon, J. (2002). Can We Call Behaviors Addictive? *Clinical Psychologist, 6, (2),* 44-49.

Park. W. K. (2005). Mobile Phone Addiction. Computer Science, Mobile Communications, Computer Supported Cooperative Work, 31(3), 253-272.

Pawłowska, B., & Potembska, E. (2011). Gender And Severity Of Symptoms Of Mobile Phone Addiction in Polish Gymnasium, Secondary School And University Students. *CurrProbl Psychiatry, 12(4),* 433-438.

Perry, S., & Lee, K. (2007). Mobile Phone Text Messaging Overuse Among Developing World University Students. *COMMUNICATIO, 33(2),* 63–79.

Szpakow, A., Stryzhak, A., & Prokopowicz, W. (2011). Evaluation Of Threat Of Mobile Phone – Addition Among Belarusian University Students. *Prog. Health Sci., 1(2),* 96-101.

Takao, M., Takahashi, S., & Kitamura, M. (2009). Addictive Personality and Problematic Mobile Phone Use. *Cyber psychology Behavior; 12(5), 501-507.*

Telecommunication Regulatory Authority (2012). *Quarterly Report on Telecom Market Indicators Q2*, 2012 Market Research and Planning Economic Affairs Unit. Retrieved from www.tra.gov.om.

Turner, M., Love, S., & Howell, M. (2008). Understanding emotions experienced when using a mobile phone in public: The social usability of mobile (cellular) telephones .*Telematics and Informatics, 25(3),* 201-215.

Villella, C., Martinotti M., G., Di Nicola, M., Cassano, M., La Torre, G., Gliubizzi, M. D., Messeri, I., Petruccelli, F., Bria, P., Janiri, & Conte, G. (2011). Behavioral Addictions in Adolescents and Young Adults: Results from a Prevalence Study. *J Gambl Stud, 27,* 203–214.

Walsh, S. P. (2009). *Psychological Approach To Understanding Young Australian's Mobile Phone Behavior*. Unpublished PHD dissertation. Queensland University of Technology, Australia.

Appendix

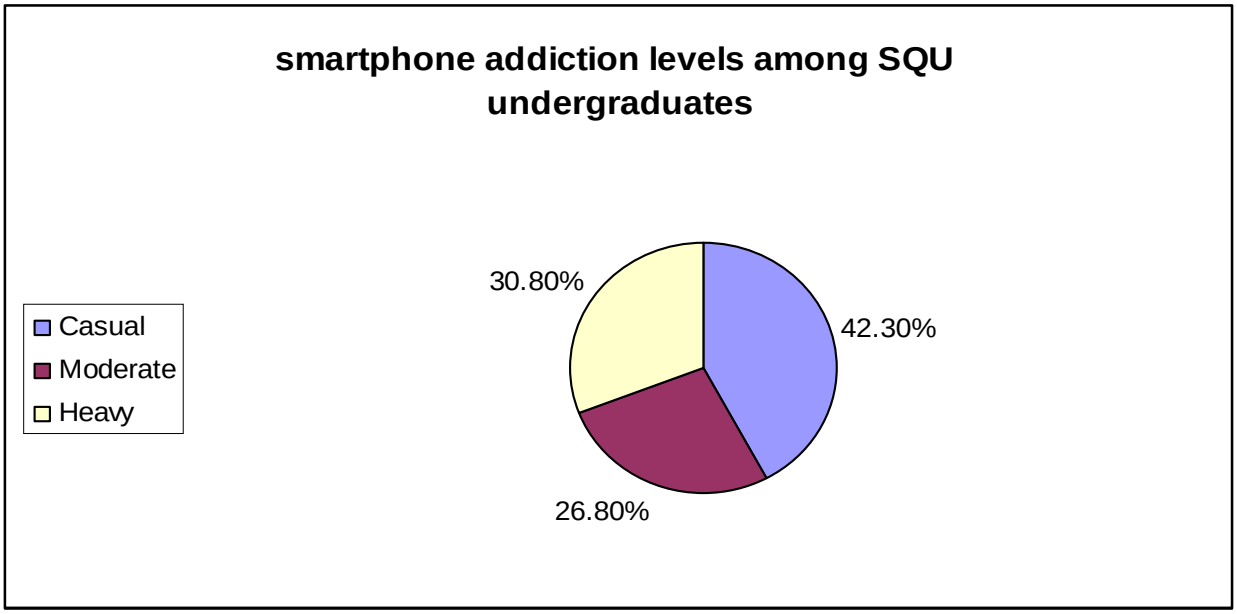

Figure 1. Percentage of smartphone addiction levels among SQU undergraduate students