

Relationship between Level of Internet Addiction, Loneliness and Life Satisfaction among College of Health and Rehabilitation Sciences Students' at Princess NourahBint Abdulrahman University

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Abstract: Background: The risk of internet addiction among students from age 18-24 was increasing in many countries now a day. Although the internet is useful tool, internet addiction was associated with physiological and physical problem. The aim of this study was to assess the relationship between level of internet addiction, loneliness, and life satisfaction among Health and Rehabilitation Science. Descriptive correlational design was used to achieve this aim. This study was done by students at Princess Nourah university in Riyadh. Multistage cluster sampling was utilized to determine the size of sample which was 180 female students. Three tools for data collection were used: standardized scales of Internet Addiction Scale (IAS) UCLA Loneliness Scale (ULS) and Satisfaction with Life Scale (SWLS). The result revealed that most of the participants were non-addicted to internet, had a moderate level of feeling of loneliness that were highly satisfied about their life. Based on this result it was concluded that there is no relationship between internet addiction, loneliness and life satisfaction ($p>0.01$). It is recommended to broaden the population for increasing the generalizability of the results to all Saudi population.

Key words: *Level of Internet Addiction, Loneliness and Life Satisfaction, University Students.*

Introduction:

The twenty-first century is the period of technology and quick access to information through the internet. The Internet has become a primary tool for trading, entertainment communication, and education.

Moreover, people use the internet because it facilitates access to information, enables research, and improves skills such as problem-solving, critical thinking, and creativity. Nevertheless, some people are at high risk of developing internet addiction due to excessive, out of

control, and unintended internet use (Ariffudin, Mulawarman, & Japar, 2018).

Internet addiction is characterized by a preoccupation with the use of the internet. The preoccupation is accompanied by repetitive thoughts about limiting and controlling the use of the internet, uncontrollable desire to use the internet, continuous use of the internet despite the impairments at various levels of functionality, and gradually increasing the time of the

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internet use (Koyuncu, Unsal, &Arslantas, 2014).

Internet addiction

The internet has many features that may potentially reinforce addictive behavior. These include: (1) easy and flexible access 24 hours a day, (2) anonymity, (3) provision of free, (4) diversified, an unlimited number of social networks without geographical boundaries, (5) greater control over one's self-presentation, (6) provision of numerous opportunities to fulfill the need for belongingness as well as to escape from emotional difficulties, (7) problematic situations, and (8) personal hardships (Yu &Shek, 2013). In addition, internet addiction has four characteristics that are recognized as (1) using the internet for a long time without being aware or have a sense of time, (2) feeling distressed and depressed if the internet is not available, (3) tolerance, involving the desire to use the internet for a long time, and (4) negative repercussions, involving arguments, lying, poor achievement and social isolation. Additionally, people with internet addiction may face time management problems and other negative consequences on different areas of their lives, such as school, health, and parental relationships (Bozoglan, Demirer, &Sahin, 2013).

Furthermore, internet addiction impacts physical activity and exercise. For instance, those lacking physical activity have a higher rate of internet use and loneliness than those who regularly participate in physical activities (Sahin& Lok, 2018). Besides, the level of internet addiction was low among students who engage in physical activities (Lok, Lok, &Canabaz, 2017). Moreover, internet addiction may create an elevated level of psychological arousal, resulting in

poor sleeping patterns, failure to eat for long periods, and limited physical activity. Also, the user may experience mental health problems such as depression, loneliness, low self-esteem, and anxiety (Kim et al., 2006). According to Taha Shehzad, Alamro, and Wadi (2019), a high internet addiction level was found among medical students at AlQassim university. Additionally, 50% of AlJouf university students scored high in Internet Addiction Scale (Abdel-Salam, Alrowaili, Albedaiwi, Alessa, &Alfayyadh, 2019). Furthermore, among 307 of Malaysian students, 13% classified as a normal internet user, 52% with a mild addiction, 32% with moderate internet addiction, and 3% with severe addiction (Talwar et al., 2019). While 23.3% of Indiana medical students considered to be internet addicted (Gedam, Goyal, Mod, Babar, &Patond, 2016).

Loneliness

Loneliness is defined as psychological and cognitive discomfort when a person perceives herself/himself as isolated from others. There are different views in psychological theories and research that explained the loneliness concept. Social psychology theory suggests that when an individual's needs for intimacy are not met, it may result in emotional distress. Further, the cognitive psychology theory proposes that the distressing experience occurs when consistency between the person's perception and the actual social relationship becomes contrasted. Besides, the humanistic approach theorized that loneliness is a painful aspect of the person's condition that may lower self-awareness and self-esteem (VandenBos, 2013).

Loneliness can be divided into different types. Among which positive

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loneliness can be recognized when an individual becomes withdrawn from social activities for a short period of time to achieve certain goals. These goals may encompass reflection, meditation, dedication towards writing or painting, and communication with God. The second type is a mixture of positive and negative aspects of loneliness. For example, when a person confronts her/himself in periods of crisis, he/she will experience feelings of loneliness even though social support is available. Eventually, these times of hardships provide a view of self-improvement, power, and motivation. The third type of loneliness is defined as an unpleasant experience that happens when a person lacks social connections (De Jong Gierveld, van Tilburg, & Dykstra, 2006).

Loneliness is regarded as a major risk factor for depression, suicidal ideation, and attempts. Besides, it has an impact on psychological and physiological well-being in a way that may cause cognitive decline, progression in Alzheimer's Disease, diminished executive functioning, impaired sleeping pattern, elevated blood pressure, increased hypothalamic-pituitary-adrenocortical activity, and lastly, morbidity and mortality (VanderWeele, Hawkey, Thisted, & Cacioppo, 2011).

The first year in university is stressful, and most students experience feelings of loneliness, isolation, and depression. A study revealed that 75% of new freshman college students stated that they felt lonely during their first two weeks at university. Also, they found that students' feelings of loneliness are positively associated with depression. Furthermore, students who experience loneliness usually lack the social skills or competency required to

initiate relationships (Wei, Russell, & Zakalik, 2005). One of the factors that contribute to loneliness among college students is shyness. The research found that there was a significant relationship between shyness and loneliness (Zhao, Kong, & Wang, 2012).

Internet addiction and loneliness

According to Bozoglan, et al (2013), the relationship between internet addiction and loneliness existed in their findings. Additionally, researchers found that internet addiction has a significant impact on experiencing feelings of loneliness among university students (Zarbakhsh, Bahri, Rashedi, & Khademi, 2013). Another study has confirmed that loneliness rates are higher among adolescents with internet addiction (Karapetsas, Karapetsas, Zygouris, & Fotis, 2015). Likewise, Koyuncu et al. (2014) considered internet addiction as a major health problem among middle and high school students, which confirms the existence of a relationship between internet addiction and loneliness.

Life satisfaction

Life satisfaction is a concept that encompasses both emotional and cognitive evaluation of one's life (Çapan, 2010). It is defined as a positive evaluation of an individual's conditions and a judgment that at least on balance. Also, it measured up favorably against person's standards or expectations (Prasoon & Chaturvedi, 2016). Moreover, life satisfaction could also be defined as the degree to which a person positively evaluates his/her life's overall quality. In other words, how much the person likes the life he/she leads (Countney, 2019). Several studies introduced various indicators of life satisfaction. For instance, a study stated that life

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satisfaction is positively associated with mental and physical health, job functioning, interpersonal relationships, and married status (Sirgy et al., 2006).

Likewise, Lounsbury, Saudargas, Gibson, and Leong (2005) stated that school satisfaction is related to college students' life satisfaction. Further, Xiao, Tang, and Shim (2009) reported that the financial domain is a significant domain for college students' life satisfaction. Besides, friendships and close peer experiences are essential indicators of life satisfaction (Amati, Meggiolaro, Rivellini, & Zaccarin, 2018).

Internet addiction and life satisfaction

In addition to loneliness, life satisfaction has a significant association with internet addiction (Lachmann, Sariyska, Kannen, Cooper, & Montag, 2016). Recent studies found a significant and adverse relation between internet addiction and life satisfaction among medical students (Salarvand et al., 2018). Additionally, Senol-Durak and Durak (2011) confirmed that internet addiction has an impact on life satisfaction (subjective well-being). In 2014, Shahnaz and Karim found that people with internet addiction would have poor life satisfaction. Whereas, another study showed that internet addiction has a positive correlation with life satisfaction, which stating that increased use of the internet is related to higher life satisfaction (Cao, Sun, Wan, Hao, & Tao, 2011). A cross-sectional study was conducted in 2020 to assess university 160 nursing students' levels of internet addiction, loneliness, and satisfaction with life, who were all provided sociodemographic form, the Internet Addiction Scale, UCLA Loneliness Scale, and Satisfaction with Life

Scales. The results stated that no significant correlation between internet addiction, loneliness, and life satisfaction among students. The Internet has become present in every area of daily life, which makes human life easier, therefore elevating the level of life satisfaction (Turan et al., 2020). In 2000, Chou and Hsiao have concluded the impact of internet overuse increased the level of life satisfaction among college students. In conclusion, although many studies approved the relationship between internet addiction, loneliness, and life satisfaction. Nonetheless, the assessment of the nature of the relation of these variables among Saudi Health and Rehabilitation Sciences College students at Princess Nourah University has not been found in previous studies. The current study, was designed to assess the relationship between the level of internet addiction, loneliness and life satisfaction among Health and Rehabilitation Sciences College students at Princess Nourah University (PNU) in Riyadh. We hypothesized that internet addiction will lead to increased feeling of loneliness, and lower life satisfaction. This area of research is important to assess to provide guidance and awareness about the possible issue. Also, to facilitate further research in this topic. Furthermore, students from age 17-26 are the most group age who is vulnerable to have internet addiction as well as loneliness (Kamel, 2016).

Methodology

Research Design

A descriptive correlational study design was utilized to conduct the current research. The study aims to find the relationship between three variables which are level of internet addiction, loneliness and life satisfaction using

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standardized questionnaires. The study was conducted at Princess Nourah University (PNU) and data was collected from students in Health and Rehabilitation Sciences College, involving Clinical Psychology, Health Education, Clinical Nutrition, Epidemiology, Physical Therapy, Occupational Therapy, Audiology, Speech-Language Pathology, Radiation Therapy, Nuclear Medicine,

Ultrasound and Diagnostic radiology programs.

Participants

The sample was recruited from Health and Rehabilitation Sciences College at Princess Nourah University (PNU) by using openepi calculator (N=188) and, confidence level of 95% was selected.

Sample Size for Frequency in a Population

Population size (for finite population correction factor or fpc) (N): 712

Hypothesized % frequency of outcome factor in the population (p):50%/+/-5

Confidence limits as % of 100(absolute +/- %)(d): 5%

Design effect (for cluster surveys-DEFF): 1

Sample Size (n)for Various Confidence Levels

Confidence Level	Sample Size
95%	188
80%	146
90%	224
97%	345
99%	438
99.9%	588
99.99%	696

Equation

$$\text{Sample size } n = [\text{DEFF} * Np(1-p)] / [(d^2/Z^2_{1-\alpha/2} * (N-1) + p * (1-p))]$$

Table 1. Results from OpenEpi, Version 3, open source calculator—SSPropor

Source:<https://www.openepi.com/SampleSize/SSPropor.htm>

Multistage cluster sampling technique was used to determine the sample size. The population size was 712 female university students in the Faculty of Health and Rehabilitation Sciences. The formula was used to determine the sample size is (number of students from each specialty/population size *196). The number of students was proportionate

to the population of the college, from Health Sciences Department, 18 students was collected from Epidemiology (67/712*196=18), 21 students from Clinical Psychology (75/712*196=21), 21 from Health Education (75/712*196=21) and 25 from Clinical Nutrition students (91/712*196=25),

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Whereas from Rehabilitation Sciences Department, 26 students was collected from Physical Therapy, (96/712*196=26), 14 from Occupational Therapy (50/712*196=14) and from Radiological Sciences Department, seven from Radiation Therapy (26/712*196=7), 17 from Diagnostic Radiology (62/712*196=17), 12 from Nuclear Medicine (43/712*196=12), five from Ultrasound (17/712*196=5). Also, from Communication Sciences Department, 11 from Audiology (38/712*196=11) and 11 from Speech-Language Pathology students (38/712*196=11). However, the targeting sample was not fully approached due to uncontrollable circumstances (Coronavirus crisis). Thus, 180 participants were approached via face to face and online survey (including the same standardized questionnaire mentioned in 3.3 Material section). The participants from each program in Health and Rehabilitation Sciences College are Epidemiology (n=18), Clinical Psychology (n=20), Health Education (n=21) and Clinical Nutrition (n=25), Physical Therapy (n=26), Occupational Therapy (n=14), Radiation Therapy (n=7), Diagnostic Radiology (n=17), Nuclear Medicine (n=8), Ultrasound (n=2), Audiology (n=11) and Speech-Language Pathology students (n=11).

Inclusion/Exclusion Criteria

This study included undergraduate students in Health and Rehabilitation Sciences College within the age range 17-26 years old at Princess Norah Bint Abdulrahman University (PNU). Whereas, this study excluded all students from all other colleges of Health Campus.

Procedure

Researchers continued to carry out with the research project after they received the permission from the Ethics Committee of the College of Health and Rehabilitation Sciences. The data collection procedure lasted approximately one month. First, researchers reached out to the Research Centre of College of Health and Rehabilitation Sciences, with request to send an email letter to Health and Rehabilitation Sciences College to demonstrate the aim of the research project and to obtain permission and support in data collection. Separately, students were approached around different college settings such as classrooms and college campus. The students were asked to participate in this research, and some students were willing to take part in the study, however, some of them refused to participate.

Students who agreed to participate were then provided verbally with a brief introduction of the research aim, a consent form to sign it, and then they were asked to fill out the sociodemographic questionnaire.

Prior to the administration of each scale, the participants were provided with brief explanation of the instructions of each scale that was used. First scale that was introduced is the Internet Addiction Scale (IAS) then the UCLA Loneliness Scale (ULS) and at last the Satisfaction with Life Scale (SWLS). Some participants were provided with the scales via QR code scan to complete the scales online on Google Forms website, and some participants were provided with paper and pencil. Finally, participants were asked to write down their emails if they want to receive a feedback report and confidentiality was assured.

Materials

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Scales were administered to the participants to assess the relationship between the level of internet addiction, loneliness and life satisfaction. Scales were Likert-type scales which are Internet Addiction Scale (IAS), UCLA Loneliness Scale (ULS), Satisfaction with Life Scale (SWLS), and also one Sociodemographic Questionnaire.

Scale A : Socio-demographic questionnaire.

The questionnaire was prepared to collect personal information about the participants include age, educational level, specialty, marital status. Some questions were related to the internet such as internet spending hours, most used social media application, and if they have smart devices with internet.

Scale B: Internet Addiction Scale (IAS).

The Internet Addiction Scale (IAS) developed by Arnout (2007), to assess the level of adult dependency on the internet and technology, and the issues that are associated with the internet use (prominence, mood change, endurance, withdrawal symptoms, conflict and relapse). The scale was in Arabic language and consists of 60 items rated on a three-point Likert-type scale (agree, slightly agree, and disagree) with a score range from zero to 120. Individual gets two for agree, one for slightly agree, and zero for disagree. The intermediate score is (60), so the high score (higher than 60 score) indicates internet addiction, while low score (less than 60 score) does not indicate internet addiction (Kamel, 2016). According to Arnout (2007) the Internet Addiction Scale (IAS) has a high internal consistency (.79) and reported that alpha value is (.87) that

indicates the accuracy and consistency of the scale.

Scale C: The UCLA Loneliness Scale (ULS).

The scale developed by Russell (1996) to examine the level of subjective feeling of loneliness and social isolation. It consists of 20 items that have four options O (“I often feel this way”), S (“I sometimes feel this way”), R (“I rarely feel this way”), N (“I never feel this way”). The scale has a high internal consistency (coefficient a ranging from .89 to .94) and test-retest reliability over a 1-year period ($r = .73$) (Russell, Peplau, & Ferguson, 1978). It was translated and validated into the Arabic language by Aldosogy (2013). In scoring system, O's =4, S's =3, R's =2, and N's =1 and that only for the numbered statements (2-3-4-7-8-11-12-13-14-17-18), while for the statement with numbers (1-5-6-9-10-15-16-19-20) the scoring system will be in the opposite direction, so if the participant answer with “never” it is assigned a degree (4), and if the answer (rarely) it is allocated the degree (3) and so on. The range of score is 20 to 80, and higher scores indicating greater loneliness (VandenBos, 2013).

Scale D: The Satisfaction with Life Scale (SWLS).

The scale created by Dr. Aldosogy (2013) to assess individual's cognitive judgment of their satisfaction with life. It is made up of 30 statements distributed on six dimensions which are happiness, psychological stability, tranquility, contentment, social appreciation and sociality. The participants who will complete the questionnaire are asked to rate how much they are agree or disagree about each of the statements by using 5-point Likert type scale, with range

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from 1 being 'strongly disagree' to 5 being 'strongly agree' with the statement. The maximum score that participants can get is 120 and the minimum score is zero. The higher the score, the higher the sense of life satisfaction, likewise the lower and the score the lower sense of life satisfaction. The Cronbach's alpha is .863 that indicates a high level of internal consistency (Mufti, 2019).

Statistical analysis

The data was analyzed by using SPSS (Statistical Package for Social Sciences) program. Descriptive statistics involving mean, frequency and percentile were used to describe the sociodemographic of participants such as age, educational level, specialization, marital status, and also variables related to the internet and their scores from Internet Addiction Scale (IAS), UCLA Loneliness Scale (ULS) and Satisfaction with Life Scale (SWLS). The Spearman's rank correlation coefficient was used to assess the relationship between level of internet addiction, loneliness and life satisfaction and to predict if the internet addiction will lead to feeling of loneliness, and lower life satisfaction.

Ethical considerations

The study data collection accomplished after obtaining ethical approval from the Institutional Review Board Committee of Princess Norah Bint Abdulrahman University. All participants were provided with a consent form about the purpose of the study and their role in the study. The participation was voluntary, and they have the option to refuse to take part in the study. There were no physical or psychological risks by being in this study. And there was no direct benefit

to participants. In addition, the permission that have been acquired from Health and Rehabilitation Sciences to collect data from participants from their college

Results

The research conducted data that were analyzed by using SPSS (Statistical Package for Social Sciences) program. Firstly, descriptive statistic involving mean, frequency and percentile were used to describe the sociodemographic of the participants such as age, educational level, specialization, marital status, and variables related to the internet. Also, their scores from Internet Addiction Scale (IAS), UCLA Loneliness Scale (ULS) and Satisfaction with Life Scale (SWLS). Furthermore, the Spearman's rank correlation coefficient was used to assess the relationship between level of internet addiction, loneliness and life satisfaction to predict if the internet addiction will lead to feeling of loneliness, and lower life satisfaction.

Sociodemographic Analysis

The total number of the sample that researchers accessed and collected data were N=180. Some sociodemographic variables were asked from students including age, marital status, specialty, educational level, internet spending hours, most used social media application, and if they have internet connection and smart devices.

Participants' sociodemographic questionnaire was categorized into two parts. Personal information category including age, marital status, specialty, education level. Second parts including variable related to internet which are spending hours,

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smart devices, internet connection, applications.
and most uses social media

Table 2.Sociodemographic information for the sample of the study n=180

Variables	N (%)	M	SD
Age (In years)			
17-19	39(21.7)	1.883	.552
20-22	123(68.3)		
23-26	18(10)		
Specialties			
Clinical Psychology	20(11.1)		
Epidemiology	18(10)		
Health Education	21(11.7)		
Clinical Nutrition	25(13.9)		
Radiation Therapy	7(3.9)		
Physical Therapy	26(14.4)		
Occupational Therapy	14(7.8)		
Audiology	11(6.1)		
Speech-Language Pathology	11(6.1)		
Nuclear Medicine	8(4.4)		
Ultrasound	2(1.1)		
Diagnostic Radiology	17(9.4)		
Current educational level			
3-4	95(52.8)		
5-6	35(19.5)		
7-8	50(27.8)		
Marital state			
Single	175(97.2)		
Married	5(2.8)		

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Table2. shows that participants with the age 17-19 (21.7%), and about more than half of the participants were aged 20-22 (68.3%). Where the lasting participants were aged 23-26 (10%). Regarding marital status, most participants were single (97.2%), while just (2.8%) of them were married. Most participants were from Physical Therapy (N=26, 14.4%), whereas number of participants from Audiology and Speech-Language Pathology were

equal (N=11, 6.1%). The remaining participants were from Clinical Psychology (N=20, 11.1%), Epidemiology (N=18, 10%), Health Education (N=21, 11.7%), Clinical Nutrition (N=25, 13.9%), Occupational Therapy (N= 14, 7.8%), Diagnostic Radiology (N=17, 9.4%), and the lasting number of participants were from Nuclear Medicine (N=8, 4.4%), Radiation Therapy (N=7, 3.9%) and Ultrasound (N=2, 1.1%).

Table 3. Variables related to internet

Variables	N (%)	M	SD
Hours spending in internet			
2-4	31(17.2)	2.07	.64
5-8	105(58.3)		
9 and more	44(24.4)		
Having smart devices			
Yes	180(100)		
No	0		
Having internet connection			
Yes	177(98.3)		
No	3(1.7)		
Most used Social media			
Snapchat	52(28.9)		
WhatsApp	35(19.4)		
Instagram	23(12.8)		
Twitter	69(38.3)		
Facebook	1(.6)		

Table 3. shows that the majority of the participants use the internet for five to eight hours (N=105, 58.3%), whereas (N=44, 24.4%) were using the internet for nine hours and more, and lastly (N=31, 17.2) were using the internet for two to

four hours. All of the participants answered with "Yes" when they were asked about having smart devices (N=180, 100%), (N=177, 98.3%) of them answered "Yes" for having the internet connecting, and only (N=3, 1.7%)

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answered with "No". Regarding the most used social media, most of the participants chose twitter as the most application they used (N=69, 38.3%),

(N=52, 28.9%) Snapchat, (N=35, 19.4%) WhatsApp, (N=23, 12.8%) Instagram, and only (N=1, 0.6%) were use Facebook.

Internet Addiction Scale (IAS)

Internet Addiction Scale (IAS) has two categories, which are internet addicted and internet non-addicted. Categories

table will highlight the response frequencies and percentages of respondents.

Table 4. Categories of Internet Addiction Scale (IAS)

IAS	f	%	M	SD
Internet addicted	22	12.2	36.77	22.29
Internet non-addicted	158	87.8		

Table 4. presents that most of the participants reported internet non-addicted (N=158, 87.8%), and (N=22, 12.2%) were internet addicted.

UCLA Loneliness scale (ULS)

In UCLA Loneliness Scale (ULS), there are three categories which are low, moderate and high.

Table 5. Categories of UCLA Loneliness Scale (ULS)

ULS	f	%	M	SD
Low	47	26.1	58.05	6.49
Moderate	133	73.9		
High	-	-		

As illustrate in table 5. that most of the participants have a moderate level of feeling of loneliness (N=133, 73.9%),

whereas (N=47, 26.1%) scored high in loneliness feeling.

The Satisfaction with Life Scale (SWLS)

The Satisfaction with Life Scale (SWLS) is categorized into three parts, low, moderate and high. Table 5

illustrates the frequency for each category.

Table 6. Categories of Satisfaction with Life Scale (SWLS)

SWLS	f	%	M	SD
Low	1	.6	133.19	19.18
Moderate	78	43.3		
High	101	56.1		

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According to table 6. Most of the participants were highly satisfied about their life (N=101, 56.1%), (N=78, 43.3%) scores were moderate, and only (N=1, .6%) had a low level of satisfaction about their life.

Spearman's rank correlation coefficient

Spearman rank correlation is a non-parametric test that is used to measure the degree of relationship between

variables of internet addiction, loneliness and life satisfaction

Table 7. Correlation matrix of main variable among female Health and Rehabilitation Sciences students n=180

Variables	Total IAS	Total ULS	Total SWLS
IAS	-	-	-
ULS	.153	-	-
SWLS	.108	.001	-

** p < 0.01

Note. Internet Addiction Scale (IAS), UCLA Loneliness Scale (ULS) and Satisfaction with Life Scale (SWLS).

Table 7. Shows that there is no relationship between the level of internet addiction, loneliness, and life satisfaction among female Health and Rehabilitation Sciences students at Princess Norah University. Thus, this result accepts the null hypothesis that there is no relationship between level of internet addiction, loneliness and life satisfaction, and rejects the alternative hypothesis that there is a significant relationship between the level of internet addiction, loneliness and life satisfaction. Also, reject the additional

hypothesis that internet addiction would predict feeling of loneliness, and lower life satisfaction among College of Health and Rehabilitation Sciences students 'at Princess NourahBint Abdelrahman University. So, students who are internet addicted will not have feeling of loneliness and low life satisfaction. Furthermore, there is a negative relationship between UCLA Loneliness Scale and Satisfaction with Life Scale that indicating that students who have high level of life satisfaction, less feeling of loneliness.

Spearman's rank correlation coefficient with additional variables

Spearman's rank correlation coefficient also used to assess the relationship between the main variables and sociodemographic variables.

Table 8. Correlation matrix of main variable and additional variable n=180

Variables	Age	Educational level	Spatiality	Internet hours

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IAS	.910	.448	.370	.001
ULS	.584	.227	.919	.979
SWLS	.688	.748	.286	.388

** p< 0.01

Note. Internet Addiction Scale (IAS), UCLA Loneliness Scale (ULS) and Satisfaction with Life Scale (SWLS).

Table 8 proves that there is no relationship has been found between the main variables and socio-demographic variables. However, there is a positive relationship between internet addiction

and internet usage hours, stating that students who are internet addicts spend more hours on the internet, and students who are internet non-addicts spend less time on the internet.

Discussion

The main aim of this research was to assess the existence of a relationship between level of internet addiction, loneliness and life satisfaction. Several studies confirmed the effectiveness of the internet addiction on individuals' life, and most research have suggested that students at higher risk to addicting internet. The present study assessed the relationship between internet addiction, loneliness and life satisfaction by collecting data from Health and Rehabilitation Sciences students at Princess Norah University.

Scales. The finding showed that only small percentage (12.2 %) of university students were internet addicted. Likewise, a previous study that was conducted by Lićwinko, Krajewska-Kulak, and Łukaszuk (2011) reported that only about 10% of the students at the Medical University had symptoms of the internet addiction. Also, Hasmujaj (2016) stated that a small percentage (2%) of Shkodra University students were internet addicted.

The first alternative hypothesis stated that, there is a significant relationship between level of internet addiction, loneliness and life satisfaction. While the null hypothesis suggested that there is no relationship between level of internet addiction, loneliness and life satisfaction. The results revealed that there was no correlation between level of internet addiction, loneliness and life satisfaction among Health and Rehabilitation Sciences Students. While there is a negative relationship between UCLA Loneliness Scale and Satisfaction with Life Scale

The findings of this study presented that there is no relationship between internet addiction and loneliness among students. This finding is consistent with previous studies which established that the duration of internet use has not been linked to the experience of loneliness among adolescence (Eldeleklioglu, 2008). In addition, Hasmujaj (2016) stated that there is no significant level of internet addiction and loneliness among university students. However, another study found that internet addiction has a weak negative significant relationship with loneliness, which demonstrates that the level of internet addiction does not predict loneliness significantly (Eldeleklioglu&Vural, 2013). Further, Hasmujaj (2016) found that there is a negative mild correlation between internet addiction and feeling of loneliness

Participant's scores on Internet Addiction Scale was found to not be related to their scores on Loneliness and Life Satisfaction

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among university students, which can be explained that individuals who spend more time on the internet, form a relationship with other internet users.

In contrast, several studies have confirmed the strong correlation of internet addiction and loneliness. Hardie and Tee (2007) suggested that there is a relationship between loneliness and internet addiction. Similarly, Erdoğan (2008) found that loneliness was associated with using the internet excessively. Another study that comprised university students, found that internet addiction was linked with psychological disorders like depression and feeling of loneliness (Koc, 2011).

The evident differences in the findings can be attributed to the difference in culture, individuals' internet usage, purpose of internet use, and nature of Internet service (Li, O'Brien, Snyder, & Howard, 2015). Furthermore, the cultural differences may impact the relationship between internet addiction and loneliness (Anderson, 1999). Also, the age of the sample can uphold an impact on findings, for instance, recent study conducted on adults showed that the use of internet for communication leads to reduced feelings of loneliness (Cotten, Anderson, & McCullough, 2013). The low level of internet addiction among students can be attributed to their specialization in the health field, where their educational programs emphasize solely on physical and psychological health. Another reason can be the nature of the students' education demands, where they have less time to spend it on the internet.

The association between internet addiction and life satisfaction was also investigated. In the current study, results revealed that there was no significant relationship between internet addiction and life satisfaction. Students' scores in the Satisfaction with Life Scale were obviously high. One of the reasons could be the low level of internet addiction among students

(12.2%). A study conducted by Bozoglan et al. (2013), revealed that life satisfaction was the final factor affecting internet addiction, yet there was no clear and direct association established between them, which might indicate that life satisfaction affected internet addiction through loneliness. In the same research, life satisfaction had a spillover impact on internet addiction also through low self-esteem. Where some studies have shown the association between life satisfaction and self-esteem (Diener & Diener, 2009). Bozoglan et al. (2013) argued that self-esteem and life satisfaction had a spillover effect on internet addiction through loneliness.

A study conducted by Hawi and Samaha (2017), showed that the internet addiction was not causally related with life satisfaction. Moreover, this result is in accordance with other studies, which suggested the use of social networking sites had no direct impact on the satisfaction with life (Apaolaza, Hartmann, Medina, Barrutia, & Echebarria, 2013). There is a possibility that internet addiction is not tied with university students' satisfaction with life to assess the overall quality of life, which includes several aspects such as family, friends, teachers, classmates, and employers (Hawi & Samaha, 2017).

In contrast, other studies have found that there is a clear relationship between internet addiction and life satisfaction. one study that comprised university students discovered a positive relationship between internet addiction and life satisfaction (Serin, 2011). Another study that was done by Ko, Yen, Yen, Lin, and Yang (2007) demonstrated the extent to which personality traits, self-esteem, life satisfaction, mental health, and family functions predict internet addiction. Likewise, other study found that personality traits and mental health disorders particularly in adults, played an important role in developing internet

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addiction, thus adults with internet addiction experienced decrease in life satisfaction and social wellbeing (Serin, 2011).

Comparatively, other studies discovered that internet addiction was negatively linked with life satisfaction (Akin, 2012; Leung & Lee, 2005). In 2001 Moody reported that people addicted to the internet were less happy or had less life satisfaction than non-addicted. In addition, Lachmann et al. (2016) stated that all specific facets of life satisfaction tied negatively and significantly with internet addiction.

The association between feeling of loneliness and level of life satisfaction was also investigated. The results of this study indicated that loneliness is negatively related to life satisfaction, which suggested that students who are highly satisfied about their life have less feeling of loneliness. This result is consistent with the related research in the literatures. The relevant studies found a negative relationship between loneliness and life satisfaction ($r = -0.449$, $p < 0.001$). In other word, the more satisfied individuals were with their life the less lonely the felt (Wong, Gan & Chong, 2016). Likewise, other study which defined loneliness as a negative and unpleasant feeling, while life satisfaction as a positive expectation, suggested that, individuals' satisfaction level about their life was increased when their level of loneliness was decreased (Turan&Çekiç, 2018). One possible explanation that social support and self-esteem are two factors that had a significant influence in reducing feeling of loneliness and increasing individuals' life satisfaction (Yildiz, 2017).

Finally, this study found positive correlation between spending internet hours and Internet Addiction Scale. Students who spend five to eight hours a day have more scores on Internet Addiction Scale than those who spend from two to four hours a day. This correlation is

supported by other research findings. Eldeleklioglu and Vural, (2013) stated that adolescences who spend more than five hours a day have more scores on Internet Addiction Scale than those who spend less than one hours a day. In addition, Lin and Tsai (2002), reported that individuals with internet addiction have a strong desire to spend longer time on the internet to gain excitation.

Limitations

Several limitations of this study should be noted, to provide direction for future research. First, the total numbers of the sample in some specialists were not collected due to the corona virus crisis. Also, the sample of this study consisted of female university students only, thus it may not be representative of all Saudi population and make the generalization of the results somewhat limited.

Another limitation, data collection was in midterms exam duration for most of the participants, and the questionnaires that were used was having many number of items, so most of the participants were either refused to participate or they just answer for the purpose of finishing, and that was one of the difficulties that we faced in collecting data.

In addition, all the scales that were used were self-reported questionnaires, therefore the risk of subjectivity in the answering might be found in the received data.

Recommendations

With students who have internet addiction, it is important to have university counselors who provide group or individual counseling to help manage and increase awareness of how to use the internet efficiently. Also, there should be a responsible authority to enhance knowledge about the negative consequences of excessive use of internet

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supported by evidence-based research. For future research, it can be including both genders (males and females) and broader population (e.g. other universities, different cities...etc), to help to generalize the results of the study to all Saudi population. In addition, it will be important to investigate whether the correlations will be present in specific population groups, such as high school students, university students, and other adolescents. Future research can be using both quantitative and qualitative techniques for more information about internet addiction, loneliness and life satisfaction. As there was found that there is no significant relationship between internet addiction, loneliness and life satisfaction among Rehabilitation Sciences College students at Princess Norah University, future studies might benefit from this study.

Conclusion

In conclusion, internet use has been wildly spreading in the world, and it is a dominant, and convenient way of communication, as it has brought the world together. Additionally, loneliness had been explored among numerous studies with a relation to many factors. This research assessed the relationship of internet addiction, loneliness and life satisfaction among female Health and Rehabilitation Sciences College students at Princess Norah University. Three scales were used to measure the three variables, which are Internet Addiction Scale, UCLA Loneliness Scale and Satisfaction with Life Scale (SWLS). Sociodemographic questionnaire that was created to collect personal data about the participants. The findings revealed that there was no relationship between internet addiction, loneliness and life satisfaction. Lastly, the study also found that there was a negative relationship between loneliness and life satisfaction.

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