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**Prevalence of Internet Addiction among Nursing
Students and the Association with their Academic
Performance and Mental Health**

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Abstract

The objective was to investigate the prevalence of Internet Addiction (IA) among nursing students and its association with their mental health and academic performance, at King Saud Bin Abdul-Aziz University for Health Sciences, Jeddah. A descriptive correlation exploratory design was used with 147 female students selected conveniently. A self-administered Arabic version of Young (1995) IA scale and depression scale developed by Radloff (1977) were used to collect data. Almost 2 thirds of the participants (59.6%) were average on-line users compared with 38.4% and 2.1% experiencing both moderate, and severe IA, respectively. More than 2 thirds (64.6%) were experienced with depressive symptoms compared with only 35.4%, who were normal. A significant correlation was found between IA, time spent on the Internet, and depressive symptoms ($r=0.335$ and $r=0.205$), respectively. Therefore, conducting an in-service training program of Internet use and promoting a supportive environment of counseling will decrease the psychological morbidity of stress and depression among college students.

Introduction

Losing control on using the Internet leads to uncontrolled behavior, that leads to difficulties in the users daily lives and their relationship (Ko et al. 2012, Young and Rogers 1998) describe as Internet addiction (IA) (Shapira et al. 2003, Holden 2001). More specifically, IA has been defined as excessive preoccupation with the Internet, recurring thoughts about limiting and controlling use of the Internet, inability to eliminate cravings for Internet access, continued use of the Internet despite impaired functioning in various domains, spending increasingly more time on the Internet, and experiencing longings and cravings for the Internet even when it is unavailable (Young and Rogers 1998, Pirzadeh 2012).

Several studies have examined the prevalence of IA during the past few years. For example, a study conducted in the USA reported a prevalence of 1.0% (Ko et al. 2007). A study conducted in Europe reported a prevalence of 9.0% (Christakis et al. 2011), and studies conducted in Asia reported prevalence ranging from 2.0% to 18.0% (Jenaro et al. 2007). However, data from those studies reported an inconsistent occurrence rate of IA, it is no doubt that IA has become a serious public health problem around the world (Jung Koo and Hye Kwon 2014), especially in adolescents (Sung et al. 2013). Previous studies suggested that IA increased the risk of suffering from a number of negative social and health consequences, such as poor academic performance, poor personality relationship, anxiety, depression (Jie et al. 2014) and other behavioral problems (Li et al. 2010, Lin et al. 2015).

The Internet has enlightened the community world by providing copious applications and well known benefits. These benefits have been widely investigated and comprise keeping in touch with colleagues, family partners through electronic email post, finding information about food, goods, and merchandize services. In addition to the services of transferring money, searching for jobs, and getting the recent and updating news of medical health information. Moreover, other Internet advantages include; downloading of recreational soft music, visiting discussion forums, engaging with entertainment games and assisting with educational and academic needs (Akhter 2013). However, the overuse and the absence of controlling behavior over its use might have created its own problems and the Internet addiction is the commonest one among Internet users (Kapahi et al. 2013, Jahanian and Seifury 2013, Zhang et al. 2015).

The risks to people and to the community include "decrease of communal, socialization and cognitive or constructive skills". Besides, other skills could be affected by Internet overuse such as loss of inspiration for more productive accomplishments, unemployment and daily living activities (Neumann 1998).

Many research studies indicate that, IA disrupts family functioning by leading to problems in users' daily lives and relationships among family members (Young and Rogers 1998, Ko et al. 2007, Christakis et al. 2011). Like other non-chemical addictions such as those involving gambling, sex, and shopping, the primary features of Internet addiction include preoccupation,

emotional liability, tolerance, withdrawal, interpersonal conflict, and engagement in repetitive behaviors (Jenaro et al. 2007, Mohammadsalehi et al. 2015).

Nowadays, Internet is becoming an integral part of the daily life for many people in Saudi Arabia and it is spreading quickly. On the other hand, a considerable effort has been completed from the Saudi government and the Ministry of Communications to block sites that swarm offensive content and services for example undesired adult content, electronic games that contain gambling activities, and socializing and mixing relationship especially between two genders. These sites are prohibited as they conflict with the religious, cultural, legal and traditional norms. In fact, adolescents and university students are an at-risk group of population for Internet addiction because of their academic and educational needs or stressors that make them unable to control the time spent on line (Shaw and Black 2007). Alike, Internet addiction has been reported among 1.4% to 17.9% of young adult and university students in both Western and Eastern societies (Fu et al. 2010, Shaw and Black 2007).

College students experienced a lot of stressors throughout their life (Hosseini et al. 2015). Among those stressors that may involve different types of life events such as interpersonal problems, school related problems, family related problems and personal problems that are characterized by either a higher or lower frequency of occurrence. Accordingly, Jie et al. (2014) found in his study that life-stress from inter personal and school correlated positively with IA. Furthermore, Jie et al. (2014), Velezmoro et al. (2010), Li et al. (2010) concluded that life events that occur in higher frequency rather than life events that occur in lower frequency are induced to IA. In addition, Yan et al. (2013) in their study reported that, the interaction of traumatic life events and psychosomatic indications may increase the risk of IA. The relation between Internet addiction and mental health problems was reported in earlier studies. Nevertheless, depression is the most common mental disorder to be associated with Internet addiction among teenagers and university students (Yen et al. 2008). As well, several studies have been found as a relationship between insecure attachment styles and alcohol or drug addiction (McNally et al. 2003, De Rick and Vanheule 2007). Furthermore, a recent study about the relationship between Internet addiction and attachment styles (Shin et al. 2011) found an association between anxious and avoid ant styles and Internet addiction. In addition Jie et al. (2014) reported that the Internet addicts scored higher on the stressful life events, depression symptom and anxiety symptoms than the non-addicts, as the significances were only found on interpersonal problems, and school related problems and anxiety symptoms.

Significance of the Study

As, it has been reported that the estimated number of Internet users around the world reached 1,733,993,741 users by the end of September 2009 (Miniwatts Marketing Group 2010) which means that the Internet service has already penetrated to more than 25% of the world's population. This reflects a worldwide Internet user growth of more than 38% since the year 2000. The

topic of online addiction has fuelled a growing concern of the impact of virtual lives that people live online, on their real-world existence, or real-life with different factors related stressors. However, it remains unknown, whether Internet addiction is the cause or the consequence of depression, because most of these studies are cross-sectional by nature. As well, there is no evidence based research found whether there is or not an association between IA, academic performance and psychological morbidity for depression. Therefore, in the present study we were looking at identifying the prevalence of IA and its association with academic performance and mental health of nursing students at the nursing college affiliated to king Saud Bin Abdul-Aziz University for Health Sciences, Jeddah.

The aim of the present study was to investigate the prevalence of IA and its association with academic performance and the mental health of nursing students studying at the Nursing college of king Saud Bin Abdul-Aziz University for Health Sciences, Jeddah. More specifically we looked at assessing the prevalence level of IA and depressive symptoms among the nursing students, examining the association between IA, academic performance and students' mental health, and exploring the correlation between academic performance, IA and participants' demographic characteristics.

Methods

Participants and Methods

Design

An exploratory descriptive correlational design was utilized to achieve the objectives of the current study.

Sampling and Setting

A convenient sampling technique was used to collect data from undergraduate nursing students studying at nursing colleges affiliated to king Saud Bin Abdul-Aziz University for Health Sciences, Jeddah.

To achieve the purpose of the present study 3 main tools were used, it consisted of:

- **First part:** Socio-demographic characteristics sheet of the participants contains questions enquires about; age, academic year, academic performance (GPA), marital states, stream, residence, number of hours spent on the Internet.
- **Second instrument:** The Arabic version of Internet Addiction Test (IAT) was administrated to assess the prevalence rate of IA among nursing students. Originally, IAT was designed by Young (1995). The Arabic version of IAT has been validated in a study conducted in Lebanon by Hawi (2013). It is a self-rated test that contains 20 items. Each item was scored on a scale of 0-5. As 0 means (Does not

apply) to 5 (Always). A three categorical score was given to describe the level of Internet addiction as following: a score of 20-49 suggests controlled or average usage (mild addiction), a score of 50-79 suggests occasional or frequent problems (moderate addiction); and a score of 80-100 suggests significant problems (severe addiction). IA was assessed by summing the scores and scores ≥ 50 were classified as IA (Young 1995). IAT is the most popular and commonly used instrument for the measurement of Internet addiction. The tool validity and reliability were confirmed through a reported study that indicated adequate reliability of Chinese, Arabic and English (Cronbach alpha ≥ 0.90) (Guan et al. 2012, Khazaal et al. 2008).

- **Third instrument:** Center for Epidemiologic Studies Depression Scale (CES-D) developed by (Radloff 1977) which has been used extensively in studies of adolescents. The respondents were asked to complete the 20-item of the Depression Scale by indicating how often they have felt or behaved during the past week. All Items are rated from 0 to 3, except for items no. 4, 8, 12, & 16 were rated in reverse as rated from 3 to 0. The Score is the sum of the 20 item weights. A score of 16 or greater is considered depressed. The (CES-D) scale had a very Internal Consistency Reliability (Cronbach alpha ≥ 0.91).

Data Management and Analysis Plan

The data was analyzed by using the most recent SPSS version 20. The collected data was coded; validated, cleaned and the missing data was controlled before the analysis. Appropriate statistical tests such as, descriptive statistics (frequencies, percentages, and graphs) and the association among variables of the study with socio-demographic background by using the Spearman Rank Order Correlations. A suitable test will be used to achieve the current study objectives.

Ethical and Legal Consideration

An official permission from the College Ethical Research Committee in the nursing college was taken for data collection. The participants learned about the nature and the objective of the study, that their participation is voluntary and that they can revoke from the study at any time. A written consent was obtained from all participants. The confidentiality and anonymity of the collected data was assured for all participants.

Results

Table 1 shows the demographic criteria of studied participants. Their age ranged between 18-30 with 21.17 ± 3.9 , while their GPA ranged from 1.75 to 4.6 with a total mean of 3.63 ± 0.59 .

Table 1. Socio-Demographic Characteristics of the Study Nurses

	Minimum	Maximum	Mean	±SD
Age (years)	18	30	21.17	3.88
GPA	1.75	4.6	3.63	0.59

Source: Authors' calculations.

Table 2 shows that the majority (77.5%) of participants were in stream I, 91.2% were single and 82.9% lived in Jeddah.

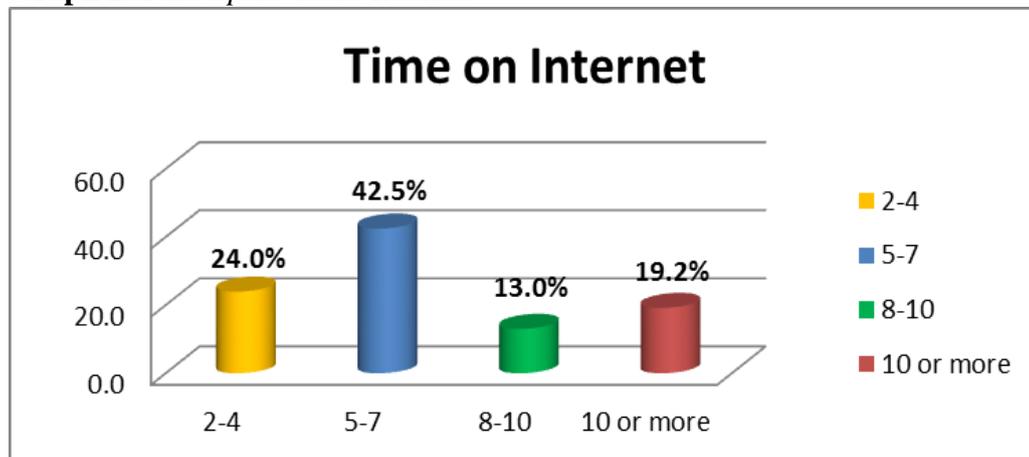
Table 2. Frequency Distribution of Participants' Demographic Characteristics

Variables	No	%
Educational Program		
Stream I	110	77.5%
Stream II	37	25.2%
Marital Status		
Single	134	91.2%
Married	13	52.8%
City		
Jeddah	122	82.9%
Makkah	23	15.6%
Madinah	2	1.5%

Source: Authors' calculations.

Graph 1 shows the time spent by studied participants on the Internet, nearly half 42.5% of them spent 5-7 hours followed by 24.0% spent 2-4 hours and only 19.2% spent 10 hours or more.

Graph 1. Time Spent in the Internet



Source: Authors' calculations.

Table 3 shows the frequency of distribution for Internet addiction statements among the studied participants. Most of the participants scores ranged from rarely and frequently using Internet except for item no. 1, 2, 5, 11, and 12 (6.8%, 13.0%, 13.1%, 20.0% and 9.6%) respectively.

Table 3. Frequency Distribution for Internet Addiction Statements

Statements	Rarely		Occasion.		Frequent.		Often		Always	
	N	%	N	%	N	%	N	%	N	%
1. How often do you find that you stay on-line longer than you intended?	10	6.8	36	24.7	52	35.6	25	17.1	23	15.8
2. How often do you neglect household chores to spend more time on-line?	19	13.0	48	32.9	49	33.6	21	14.4	9	6.2
3. How often do you prefer the excitement of the Internet to intimacy with your partner?	59	44.4	38	28.6	23	17.3	8	6.0	5	3.8
4. How often do you form new relationships with fellow on-line users?	44	30.3	48	33.1	32	22.1	14	9.7	7	4.8
5. How often do others in your life complain to you about the amount of time you spend on-line?	19	13.1	60	41.4	33	22.8	19	13.1	14	9.7
6. How often do your grades or school work suffers because of the amount of time you spend on-line?	42	29.8	46	32.6	43	30.5	8	5.7	2	1.4
7. How often do you check your email before something else that you need to do?	40	27.4	54	37.0	29	19.9	9	6.2	14	0.6
8. How often does your job performance or productivity suffer because of the Internet?	46	32.6	51	36.2	32	22.7	7	5.0	5	3.5
9. How often do you become defensive or secretive when anyone asks you what you do on-line?	50	34.2	47	32.2	23	15.8	16	11.0	10	6.8
10. How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?	34	23.4	39	26.9	41	28.3	18	12.4	13	9.0
11. How often do you find yourself anticipating when you will go on-line again?	29	20.0	40	27.6	42	29.0	13	9.0	21	14.5
12. How often do you fear that life without the Internet would be boring, empty, and joyless?	14	9.6	31	21.2	41	28.1	17	11.6	43	29.5
13. How often do you snap, yell, or act annoyed if	39	26.7	50	34.2	32	21.9	19	13.0	6	4.1

someone bothers you while you are on-line?										
14.How often do you lose sleep due to late-night log-ins?	37	25.7	34	23.6	38	26.4	14	9.7	21	14.6
15.How often do you feel preoccupied with the Internet when off-line, or fantasize about being on-line?	58	39.7	29	19.9	33	22.6	15	10.3	11	7.5
16.How often do you find yourself saying "just a few more minutes" when on-line?	46	31.5	39	26.7	34	23.3	14	9.6	13	8.9
17.How often do you try to cut down the amount of time you spend on-line and fail?	37	25.5	46	31.7	38	26.2	11	7.6	13	9.0
18.How often do you try to hide how long you have been on-line?	74	51.7	26	18.2	24	16.8	14	9.8	5	3.5
19.How often do you choose to spend more time on-line over going out with others?	45	30.8	54	37.0	33	22.6	8	5.5	6	4.1
20.How often do you feel depressed, moody or nervous when you are off-line, which goes away once you are back on-line?	43	29.5	52	35.6	28	19.2	15	10.3	8	5.5

Source: Authors' calculations.

Table 4 shows the frequency of distribution for statements among studied participants. Most of the participants scores ranged from rarely and some of the day and occasionally felt depressive symptoms except for statements no. 4 (25.7%), no. 5 (27.9%), and no. 7 (26.2%), respectively.

Table 4. Frequency Distribution for Depression Statements

Statements	During the past week							
	Rarely (less than 1 day)		Some of the time (1-2 days)		Occasionally (3-4 days)		Most of the time (5-7 days)	
	N	%	N	%	N	%	N	%
1. I was bothered by things that usually do not bother me.	65	44.8	45	31.0	23	15.9	12	8.3
2. I did not feel like eating; my appetite was poor.	59	40.7	64	44.1	18	12.4	4	2.8
3. I felt that I could not shake off the blues even with help from my family or friends.	51	36.2	62	44.0	21	14.9	7	5.0
4. I felt I was just as good as other people.	36	25.7	52	37.1	39	27.9	13	9.3
5. I had trouble keeping my mind on what I was doing.	39	27.9	58	41.4	34	24.3	9	6.4
6. I felt depressed.	56	38.1	52	35.4	33	22.4	6	4.1
7. I felt that everything I did was an effort.	38	26.2	58	40.0	35	24.1	14	9.7
8. I felt hopeful about the future.	30	20.8	37	25.7	32	22.2	45	31.3
9. I thought my life had been a failure.	70	49.0	40	28.0	24	16.8	9	6.3
10. I felt fearful.	59	40.7	54	37.2	23	15.9	9	6.2
11. My sleep was restless.	39	27.7	51	36.2	32	22.7	19	13.5
12. I was happy.	26	17.8	45	30.8	38	26.0	37	25.3
13. I talked less than usual.	42	30.2	53	38.1	30	21.6	14	10.1
14. I felt lonely.	69	47.9	42	29.2	27	18.8	6	4.2
15. People were unfriendly.	54	37.0	54	37.0	28	19.2	10	6.8
16. I enjoyed life.	33	23.1	36	25.2	31	21.7	43	30.1
17. I had crying spells.	62	43.1	51	35.4	25	17.4	6	4.2
18. I felt sad.	59	41.0	55	38.2	21	14.6	9	6.3
19. I felt that people dislike me.	74	52.1	42	30.3	20	14.1	5	3.5
20. I could not get "going".	58	39.7	57	39.0	26	17.8	5	3.4

Source: Authors' calculations.

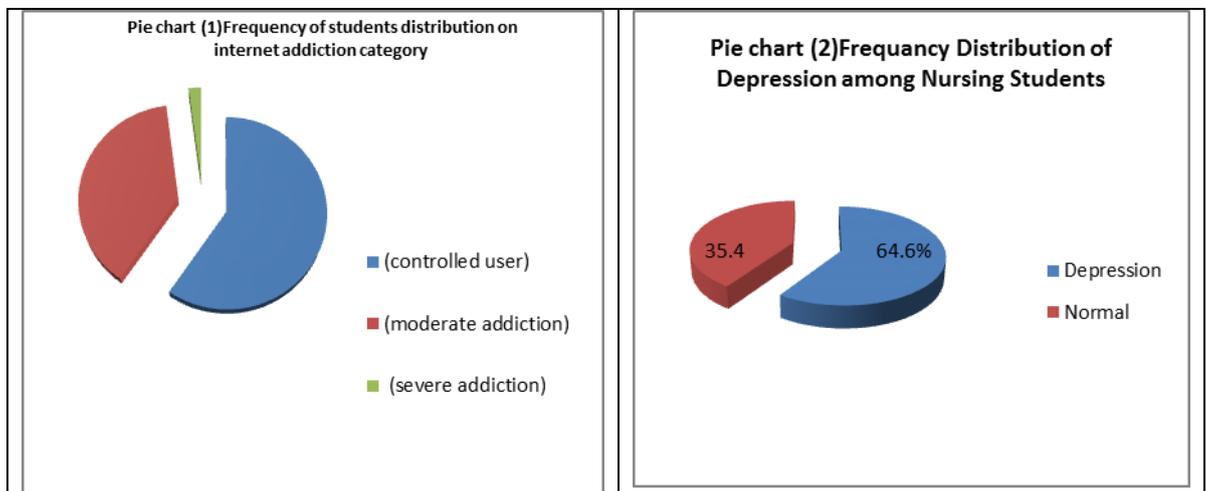
Table 5 showed the total mean of the depression score was 20.18 ± 7.743 while 48.53 ± 13.851 was given for IA total score.

Table 5. Mean and Standard Division for Depression and Internet Addiction

	N	Minimum	Maximum	Mean	Std. Deviation
Depression total score	147	3	51	20.18	7.743
Addiction total score	147	27	88	48.53	13.851

Source: Authors' calculations.

Pie chart 1 shows classification of students according to Internet addiction categories of score and depression. The total score for IA was categorized into 3 main categories accordingly almost two third (59.6%) of the participant students were in average online use followed by 38.4% occasionally or frequently used and only 2.1% were faced with significant problem so they are significantly used the online intranet. Pie chart 2 shows the prevalence of depression among student participants, it is surprising that more than 2 third (64.6%) of them suffering from depression compared by 35.4% had no depressive symptoms.



Source: Authors' calculations.

Regarding the correlation between age, GPA, time on Internet, addiction and depression, the results showed that there is a significant correlation between Internet addiction ($r = 0.335$) and the time spent on line and depressive morbidity ($r = 0.205$) and IA, while age of participants and GPA did not show any significant correlation with any of the measured variables of IA and the depression scale (Table 7).

Table 7. *Pearson Correlation between Age, GPA, Time on Internet, Addiction and Depression*

	Age	GPA	Time on Internet	Addiction	Depression
Age	1				
GPA	-0.055	1			
Time on Internet	0.002	-0.112	1		
Addiction	-0.003	-0.128	0.335**	1	
Depression	-0.061	0.150	0.057	0.205*	1

Source: Authors' calculations.

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Discussion

Internet addiction (IA) is a comparatively recent arena of academic and educational inquiry. Experiential researches proposed that IA, like other well researched addictive behaviors, has an influence on many features of individuals' daily living activities, such as academic work performance, socialization, and physical and psychological health (Goldberg 1996, Young 1996).

The main objective of the current study was to examine the prevalence of IA among nursing students and its association with their academic performance and mental health in king Saud Bin Abdul-Aziz University for health sciences, Jeddah.

The current research finding revealed that 38.4% and 2.1% of our participants were categorized as moderate to severe Internet addiction respectively. This result is congruent with Alhajjar (2014) in his study in a Palestine sample of students at Gaza strip as he found that 30.1% were at risk for Internet addiction. Also, Lam et al. (2014) in their study found that 10.2% of the studied adolescents were moderately addicted, and 0.6% were severely addicted to the Internet.

Moreover, there have been several studies about the prevalence rate of Internet addiction in the middle and Far East. Among those studies an Iranian study done by Mazhari (2012) examining the prevalence of IA among medical students as she found that 21% of the students were identified as problematic Internet users, and Kheirkhah et al. (2010) investigated the prevalence of Internet addiction in the Mazandaran province as they found that 22.8% of the Internet users were Internet addicts and Internet addiction was significantly higher in males and younger age groups. In fact an extensive body of research concluded that 54.7% of Internet addicts were university students (Kheirkhah et al. 2010).

Besides, university students are among high risk groups for Internet addiction because they use the Internet for both educational purposes, such as doing assignments and searching information sources and non-educational purposes like communication with friends and entertainment. In addition, easy

access to the Internet in the universities and absence of parental control are factors resulting in Internet overuse by university students. Accordingly, the previous research done in European university students reported the higher prevalence rate of Internet addiction among them as it has been reported to be 4% in the United States, 10.6% in China, 5.9% and 17.9% in Taiwan, and 34.7% in Greece (Chou and Hsiao 2000, Wu and Zhu 2004, Christakis et al. 2011, Frangos and Sotiropoulos 2011).

Regarding the prevalence of depression among the studied sample, the present research finding is very surprising as more than 2 thirds (64.6%) of participants had depression and has a significant correlation with Internet addiction. This reported results goes on the same track with the results of previous research and perspectives conducted by Li and Chung (2006) Mesch (2001), Treuer et al. (2001) and Yellowlees and Marks (2005) who noted that students who were categorized as pathological and excessive user of the Internet, their mental health would be declined. They found that the students who use Internet pathologically and excessively, showed greater psychiatric vulnerability for depression and suicidal ideation and psychological problems such as anxiety and self-injurious behavior than students who did not have such experiences. Indeed, the current research results are in the same line with findings of Iqbal et al. (2014), Kutty and Sreeramareddy (2014), Muussesa et al. (2014), Yoo et al. (2013), Bidi et al. (2012), Alavi et al. (2010), Kim et al. (2006), and Alhajjar (2014).

As mentioned earlier that, college students experienced a lot of stressors throughout their life. Among those stressors that may involve different types of life events such as interpersonal problems, school related problems, family related problems and personal problems that characterized by either higher or lower frequency of occurrence. Accordingly, Jie et al. (2014) found in his study that life stress from inter personal and school correlated positively with IA. Moreover, nursing students face a lot of stress factors in their educational experiences such as clinical settings environment, death and dying patients, barrier in application of their clinical skills, conflict relationship with nurses and patients, examinations ,curriculum and academic workload and lack of free recreational time (Gibbons et al. 2009, Pryjmachuk and Richards 2008).

Several studies proved that Internet addiction has a negative impact on the academic performance of the students (Akhter 2013, Asemah et al. 2013, Sachitra 2015, and Wang et al. 2011). Those results are not consistence with our findings as no association was found between IA and students' academic performance. This may be due to limited response rate from the participants since the study sample was recruited conveniently from female students applied to one program (nursing program) in the university and the research relies on self-report and voluntary response, and the comparison between two genders has a major role in the findings of previous studies on IA. Also, it was reported that female students usually have a higher GPA than male students.

In a previous study done by Nasiri et al. (2011) they reported that students try to forget the stress of academic work load by spending more time in intranet this is in the same line with our finding of significant correlation was found

between time spent in intranet and IA. The evidence of IA has been recommended by an extensive body of research as it was reported that some of the Internet users spend longer periods of time connected and experience alienation, isolation and depressive symptoms when offline. Besides, the preoccupied individuals with electronic games, search and recreational activities may be liable to neglect sporting and aerobic exercise, and familial communication as well as societal accomplishments (Kim et al. 2010, Nalwa and Anand 2003, Seo et al. 2009, Yang and Tung 2007, Young 2004).

Conclusion and Recommendations

From the current study findings it was concluded that nursing students are experienced moderate to severe levels of Internet addiction without any impact on their academic performance with higher prevalence rate of psychiatric and psychological morbidity for depression.

Therefore, it is urgent and important to pay more attention to medical and nursing colleges students' psychological morbidity for IA and depression. Conducting an in-services educational program, for college students, that provides information about the impact of the pathological use of online use on their physical, psychological and mental health. In addition, providing controlled intranet services in the university compound may play an important role in decreasing the prevalence of IA among students. It is recommended to replicating the study using both genders and studying the reasons for Internet addiction and depression as it may be rooted in some common etiological factors that requires further exploration. Also, future studies on the relationship between Internet addiction and stressful life events may provide a clear explanation for the higher prevalence rate of depression among college students.

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