RESEARCH ARTICLE

INTERNET ADDICTION AMONG SECONDARY SCHOOL STUDENTS IN RIYADH CITY, ITS PREVALENCE, CORRELATES AND RELATION TO DEPRESSION: A QUESTIONNAIRE SURVEY

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ABSTRACT

Background: There has been an explosive growth of internet usage worldwide and this is expected to continue with its use becoming an integral part of everyday life. The internet provides tremendous educational benefits; however, excessive internet use can lead to negative outcomes such as poor school performance and social isolation.

Aims & Objective: To measure the prevalence of internet addiction among secondary school students in Riyadh city, its correlates and its relation to depression.

Material and Methods: A cross sectional survey, was conducted between May and June 2010, using a self-administered questionnaire distributed to randomly selected 770 secondary schools students, using 20-item Young's internet addiction test, and the Center for epidemiological studies depression scale, with questions related to demographic, social, academic and internet use factors.

Results: 716 students answered the questionnaire, 391 are males and 325 are females. Prevalence was 5.3%, with male predominance. Internet addiction was associated with a lower degree of school performance, more hours using internet every day, lower level of parental control, and higher level of depression.

Conclusion: Internet addiction has psychological, physical, and social effects on adolescents' life, which requires preventive strategies and therapeutic interventions.

Key-Words: Internet Addiction; Pathological Internet Use; Prevalence; Adolescents; Depression

Introduction

There has been an explosive growth of internet usage worldwide and this is expected to continue with its use becoming an integral part of everyday life. The internet has become more accessible in homes, schools, colleges, libraries and internet cafes; access is further aided with the increasing affordability of home computers and high-speed connections over the last decade.[1]

Preliminary studies done by the National Center of Education Statistics[2], have shown that a large number of children and adolescents in America (5 to 17 years old) have access to the internet, and are being exposed to the internet at a very early age; with 78% of adolescents in the age group 15–17 years being internet users.

Common online activities include completing schoolwork, playing online games, reading and writing emails and engaging in real time chatting.[3] The internet provides tremendous educational benefits including access to information across a wide variety of topics, establishing educational links and enhancing communication with teachers and classmates.[1] However, excessive internet use can lead to negative outcomes such as poor school performance, social isolation, and might impede an adolescent's achievement of psychosocial developmental tasks.[3]

As such, internet addiction has become a growing area of concern, interest, research, and debate.[4] Essentially, internet use becomes pathological when it interferes with one or more major areas of life functioning such as significant relationships, occupation, school, mental health, or physical health.[4]

This study aimed to estimate the prevalence of internet addiction, determine its associated factors and its relationship with depression among secondary school students in Riyadh city.

Materials and Methods

A cross sectional survey, using a self-administered questionnaire, was conducted between May and June 2010, among governmental Saudi secondary school students (boys and girls) in Riyadh city, Saudi Arabia. There are 217 secondary schools for boys with 89,008 students, and 266 secondary schools for girls with 88,481 students in Riyadh city.[5]

Two-stage random sampling was used, in the first stage, a

sample of six governmental secondary schools had been selected by simple random technique, three school for boys and three for girls. In the second stage, five classes from each school were selected by simple random technique; the whole class was invited to participate in the study, except those who are non-Saudi or not lying between 15-18 years of age.

The sample size (770 participants) was calculated using open epi info software, using confidence level of 95%, power 80%, and population size of 177500.

A self-administered questionnaire of three parts was utilized for data collection, the general information part, followed by the measure of internet addiction, and then the measure of depression. The general information part includes demographic data; age, gender, the performance in the school last semester, the average time using the internet every day, family economic status, the preferred type of website usually accessed, the usual daily sleeping hours, the number of days of missing class, and the degree of parental control.

The measurement of internet addiction part is a 20-item Young's internet addiction test (IAT) examines the degree of pre-occupation, compulsive use, behavioural problems, emotional changes, and the impact on life related to internet use.[6]

The 20 items of the IAT are calibrated scores ranging from 1–5 (given a total score ranging from 20–100), self-rating questions with the Likert scale of one (rarely) to five (always), with higher scores reflecting a greater tendency toward addiction.

Three types of internet-user groups were identified in accordance with the original scheme of Young: internet addicts, possible internet addicts, and non-addicts, as follow: Internet addicts: defined as those who have score from 70 to 100, the internet is causing significant problems for them. Possible internet addicts: defined as those who have score from 40 to 69, which signifies frequent problems due to internet usage. Non-addicts: defined as those who have score less than 40, they are average online users, who have complete control over their usage, and did not exhibit any disturbances in their daily lives as a result of internet use.[7] The IAT appears to be valid and reliable.[7]

The existence of Depression was assessed using the Center for epidemiological studies depression scale for children (CES-DC), which is a 20-item self-reported depression inventory, with the Likert scale of zero (not at all) to three (a lot), however, items 4, 8, 12, and 16 are phrased positively, and thus are scored in the opposite order. The total possible scores ranging from 0 to 60.[8] The most frequently used cutoff score for the CES-D is 16, which indicates moderate depression.[9] It has been approved to be reliable and valid in children and adolescents.[10]

The two scales were translated into Arabic language, and then retranslated back to English to ensure accuracy of translation and validity of Arabic version. The questionnaire was pre-tested on 20 students and it was clear and understandable. Permission from Educational authorities in Riyadh was obtained. The purpose of the study was explained to students and teachers. It was also explained to the participants that the data would be used solely for the purpose of the study, and that their privacy and anonymity would be fully protected. All participants completed the questionnaire in the class rooms, anonymously after obtaining verbal consent.

Statistical Analysis

Data were analyzed using the statistical package for social science (SPSS) software (version 15.0). Descriptive analyses were performed on all variables. Cross-tabulation was used to test for demographic differences among the three internet addiction test (IAS) groups. Correlation tests were used to describe the distributions of participant characteristics. Student's t-test and analysis of variance (ANOVA) were conducted to compare scores between the three IAS. P-value of 0.05 was used as a test of significance.

Results

770 self-administered questionnaires were distributed to the students. 716 questionnaires were completed, 54 questionnaires were not filled, not completed or not returned, giving a response rate of 93%. Of those 716 students, 391 were males and 325 were females. The mean age was 17 years. 52 students (7.2%) reported that they did not access the internet before. Other demographic data are shown in table 1.

The overall prevalence of internet addiction was 5.3%. Boys reported more internet addiction than girls, with percentage of 7% and 4.2% respectively. The 38 participants with Internet addiction comprised 25 male students (65.8%) and 13 female students (34.2%). Of the 664 internet users, 337 students (50.7%) were possible addicts, and 289 (43.5%) were non-addicts (Figure-1).

No significant difference in internet addiction between different ages included in the study. Internet addiction was

associated with a lower degree of school performance, only 21% of internet addicts they had grades more than 90% last semester, compared to 38% and 29.4% of non-addicts and possible addicts respectively (Table 2). Furthermore, students with grades less than 70% have higher score on internet addiction test (46.23) compared to other students with better grades (Table 3). Also, the internet addicts have higher absence rate from school, 29% of them have more than 5 absence days last month, compared to 17% and 23.1% of non-addicts and possible addicts respectively. But the result is statistically insignificant.

Table-1: Demographic Characteristics of Secondary School Students

Demographic		No. (n=716)	%
Age (Years)	15	29	4.1
	16	163	22.8
	17	255	35.6
	18	269	37.6
Gender	Female	325	45.4
	Male	391	54.6
Degree in the last semester	90% & above	227	31.7
	80-<90%	187	26.1
	70-<80%	184	25.7
	<70%	118	16.5
Family monthly income	<5000	67	9.4
	5000-9999	256	35.8
	10000-15000	210	29.3
	>15000	183	25.6
Own computer?	Yes	474	66.2
	No	242	33.7
Used internet before?	Yes	664	92.7
	No	52	7.3
Average internet using hours/day	> 5 hours	170	25.6
	> 3 - ≤ 5 hours	119	17.9
	2-3 hours	184	27.7
	<2 hours	191	28.8
Preferred place for using internet	Home	590	88.9
	Internet Cafe	42	6.3
	School	4	0.6
	Others	28	4.2
Parents know about my internet activities	Never	113	17.0
	Rarely	84	12.7
	Sometimes	194	29.2
	Most of the times	136	20.5
	Always	137	20.6
Preferred website	Forums	153	23.0
	E-mailing	139	20.9
	no preferred website	70	10.5
	Chatting	71	10.7
	General websites	69	10.4
	Community sites	62	9.3
	Games	41	6.2
	Blogs	5	0.8
	Others	54	8.1
No. of sleeping hours/day	<3 hrs	25	3.8
	3-4 hrs	83	12.5
	> 4-6 hrs	221	33.3
	>6 hrs	335	50.5
No. of absence days from school last month	Nil	258	38.9
	1 day	70	10.5
	2-3 days	136	20.5
	4-5 days	62	9.3
	>5 days	138	20.8

But there was significant relationship between number of absence days and average score on internet addiction test, those who had more than 4 absence days last month had slightly higher average score (Table 4). There was also no significant relationship between internet addiction and family economic status, or the preferred place of using internet. Having own computer is found to be more with internet addicts (81.6% of them), compared to 65.3% and 73.3% of non-addicts and possible addicts respectively.

Table-2: Different Factors and their Relation to Internet Addiction

Demographic		Internet Addiction						P-value
		No (n=289)		Possible (n=337)		Yes (n=38)		
		N	%	N	%	N	%	
Age (Years)	15	8	30.8	16	61.5	2	7.7	0.567
	16	62	40.0	85	54.8	8	5.2	
	17	105	44.7	119	50.6	11	4.7	
	18	114	46.0	117	47.2	17	6.9	
Gender	Female	167	46.6	166	46.4	25	7.0	0.033
	Male	122	39.9	171	55.9	13	4.2	
Degree in the last semester	≥90%	110	50.7	99	45.6	8	3.7	0.031
	80-<90%	72	41.1	96	54.9	7	4.0	
	70-<80%	71	42.8	81	48.8	14	8.4	
	<70%	36	34.0	61	57.5	9	8.5	
Family monthly income	<5000	29	51.8	24	42.9	3	5.4	0.122
	5000-9999	113	48.3	107	45.7	14	6.0	
	10000-15000	70	35.2	118	59.3	11	5.5	
	>15000	77	44.0	88	50.3	10	5.7	
Own computer?	Yes	189	40.5	247	52.9	31	6.6	0.029
	No	100	50.8	90	45.7	7	3.6	

Table-3: Different Factors and their Relation to Average Score on Internet Addiction Test

Demographic		N	Internet Addict Test		
			Means ± SD	Test	P-value
Age (Years)	15	26	49.04 ± 14.82	F= 1.677	0.171
	16	155	44.19 ± 14.00		
	17	235	42.61 ± 14.39		
	18	248	43.46 ± 14.84		
Gender	Female	358	43.21 ± 15.13	T= -0.656	0.512
	Male	306	43.95 ± 13.76		
Degree in the last semester	≥90%	217	40.81 ± 13.72	F= 4.309	0.005
	80-<90%	175	44.59 ± 13.81		
	70-<80%	166	44.33 ± 15.46		
	<70%	106	46.23 ± 15.00		
Family monthly income	<5000	56	42.18 ± 14.93	F= 0.576	0.631
	5000-9999	234	43.24 ± 14.71		
	10000-15000	199	44.59 ± 13.97		
	>15000	175	43.21 ± 14.76		
Own computer?	Yes	467	44.64 ± 14.57	3.004	0.003
	No	197	40.96 ± 14.06		

Regarding average time spent on internet per day, internet addiction was associated with more hours using internet every day. 25 students (65%) of the internet addicts are using the internet more than 5 hours per day, compared to 11.7% and 32.9% of non-addicts and possible addicts respectively (table 5). Those who spend more than 5 hours per day reported higher score on internet addiction test (53.16) as compared to other participants. Internet addiction was inversely related to the level of parents' control over internet, 44.7% of internet addicts have their parents they never know about their internet activities, compared to 11.7% and 18.4% of non-addicts and possible addicts respectively.

Table-4: Cont. Different Factors and their Relation to Average Score on Internet Addiction Test

Demographic		N	Internet Addict Test		
			Means ± SD	Test	P-value
Average internet using hours/day	> 5 hours	170	53.16 ± 13.90	F= 63.387	0.000
	> 3 - ≤ 5 hours	119	47.05 ± 14.18		
	2-3 hours	184	40.89 ± 11.21		
	<2 hours	191	35.38 ± 12.35		
Preferred place for using internet	Home	590	43.24 ± 14.21	F= 1.116	0.342
	Internet Cafe	42	47.36 ± 15.85		
	School	4	42.00 ± 15.03		
	Others	28	44.57 ± 18.18		
Parents know about my internet activities	Never	113	49.99 ± 16.59	F=10.420	0.000
	Rarely	84	44.67 ± 13.97		
	Sometimes	194	44.22 ± 13.54		
	Most of the times	136	40.65 ± 13.73		
	Always	137	39.47 ± 13.12		
Preferred website	Forums	153	43.60 ± 13.75	F =8.735	0.000
	E-mailing	139	44.66 ± 13.97		
	no preferred	70	38.07 ± 13.96		
	Chatting	71	54.96 ± 13.98		
	General websites	69	39.96 ± 1458		
	Community sites	62	42.68 ± 13.54		
	Games	41	42.12 ± 13.60		
	Blogs	5	37.40 ± 7.93		
	Others	54	39.87 ± 13.78		
No. of sleeping hours/day	<3 hrs	25	52.40 ± 14.45	F =8.288	0.000
	3-4 hrs	83	48.57 ± 15.5		
	> 4-6 hrs	221	43.29 ± 14.62		
	>6 hrs	335	41.82 ± 13.75		
No. of absence days from school last month	Nil	258	41.31 ± 14.13	F =3.682	0.006
	1 day	70	43.11 ± 14.74		
	2-3 days	136	43.66 ± 13.31		
	4-5 days	62	46.52 ± 14.32		
	>5 days	138	46.50 ± 15.71		

The preferred websites by internet addicts are the two-way communication websites, which are chat rooms (26.3%) followed by community websites (21%). For the non-addicts and possible addicts only 3.1% and 15.4% respectively they prefer chat rooms. Among The 2 groups, the preferred type of websites is the e-mail, with almost the same percentage (23%). Higher score on internet addiction test (54.96) was reported by those who prefer chat rooms as compared to others.

Results also showed significant relationship between internet addiction and poor sleep, 8% of internet addicts have their sleep duration less than 3 hours per day, compared to 1.7% and 5% of non-addicts and possible addicts respectively. Also, students with poor sleep (less than 3 hours daily) have higher score on internet addiction test (52.4) as compared to other students. Regarding the association between internet addiction and depression, there was a statistically significant relationship.

Of the 38 internet addicts, 36 (94.7%) were diagnosed to be depressed on CES-DC depression scale, compared to 46% and 68% of non-addicts and possible addicts respectively (table 6). The average score of internet addicts on CES-DC depression scale was 32.58 compared to 17.07 and 22.16 by non-addicts and possible addicts respectively (table 7).

Table-5: Cont. Different Factors and their Relation to Prevalence of Internet Addiction Test

Demographic		Internet Addiction						P-value
		No (n=289)		Possible (n=337)		Yes (n=38)		
		N	%	N	%	N	%	
Average internet using hours/day	> 5 hours	34	20.0	111	65.3	25	14.7	0.000
	> 3 - ≤ 5 hours	36	30.3	74	62.2	9	7.6	
	2-3 hours	86	46.7	96	52.2	2	1.1	
	<2 hours	133	69.6	56	29.3	2	1.0	
Preferred place for using internet	Home	261	44.2	299	50.7	30	5.1	0.421
	Internet Cafe	14	33.3	23	54.8	5	11.9	
	School	2	50.0	2	50.0	0	0.0	
	Others	12	42.9	13	46.4	3	10.7	
Parents know about my internet activities	Never	34	30.1	62	54.9	17	15.0	0.000
	Rarely	31	36.9	50	59.5	3	3.6	
	Sometimes	74	38.1	112	57.7	8	4.1	
	Most of the times	75	55.1	56	41.2	5	3.7	
	Always	75	54.7	57	41.6	5	3.6	
Preferred website	Forums	18	43.9	22	53.7	1	2.4	0.000
	E-mailing	68	44.4	78	51.0	7	4.6	
	no preferred	2	40.0	3	60.0	0	0.0	
	Chatting	9	12.7	52	73.2	10	14.1	
	General websites	41	58.6	27	38.6	2	2.9	
	Community sites	56	40.3	75	54.0	8	5.8	
	Games	28	45.2	31	50.0	3	4.8	
	Blogs	37	53.6	28	40.6	4	5.8	
	Others	30	55.6	21	38.9	3	5.6	
No. of sleeping hours/day	<3 hrs	5	20.0	17	68.0	3	12.0	0.002
	3-4 hrs	27	32.5	46	55.4	10	12.0	
	> 4-6 hrs	92	41.6	116	52.5	13	5.9	
	>6 hrs	165	49.3	158	47.2	12	3.6	
No. of absence days from school last month	Nil	134	51.9	112	43.4	12	4.7	0.058
	1 day	31	44.3	35	50.0	4	5.7	
	2-3 days	54	39.7	75	55.1	7	5.1	
	4-5 days	21	33.9	37	59.7	4	6.5	
	>5 days	49	35.5	78	56.5	11	8.0	

Table-6: Relation of Internet Addiction to Depression

Internet Addiction	CES-DC		
	Means ± SD	Test	P-value
Not addicts	17.07 ± 10.33	F = 43.930	0.000
Possible addicts	22.16 ± 10.66		
Internet addicts	32.58 ± 12.10		

Table-7: Average Score on CES-DC Depression Scale in Relation to Internet Addiction Test

Internet Addiction	CES-DC Depression Scale				P-value
	Depressed		Not depressed		
	No.	%	No.	%	
Not addicts	133	46.0	156	54.0	0.000
Possible addicts	229	68.0	108	32.0	
Internet addicts	36	94.7	2	5.3	

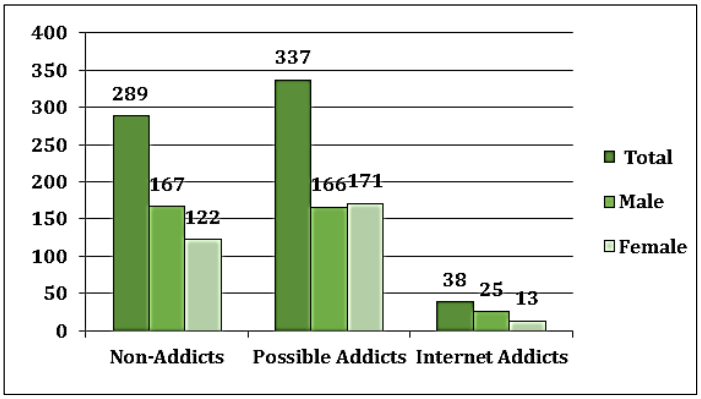

Figure-1: Results of Internet Addiction Test on Both Gender

Discussion

A dramatic change did take place in the mid-late 1990s and early 2000s. It is the revolution in Information and Communication Technologies. Probably the most notable component of this was the dramatic growth of the internet in world.[1] The internet usage prevalence is increasing in Saudi Arabia as mentioned earlier.[11] This rapid growth of the Internet has been accompanied by questions about its impact, both positive and negative, on society and users.

The only study on internet addiction done on Saudi population was done by Ismail. She had a sample of 1000 university students, 600 Egyptian and 400 Saudi students, from both genders. The assessment tool was a 60-item questionnaire developed by the author. The overall prevalence was 54.6 %, but no prevalence was calculated for the Saudi sample. This is the only study about internet addiction done on pure Saudi sample. The prevalence of internet addicts was 5.16% which is near to those reported in previous studies.[12-15]

We found that males were twice as likely as females to be internet addicts. This finding is consistent with Niemz et al.[16], who reported that males were 3 times more likely to be pathological internet users than females. Most of previous studies showed male predominance for internet addiction, this was explained by Griffiths[17] who suggested that males are more likely to use the internet to fuel other addictions such as gambling and gaming.

School and academic problems are evident by our research, internet addicts showed less degree of school performance as well as more absence rate from school. This factor was also found by all previous researchers, such as Beard[11], Young[18], Caplan[19], who considered this factor one of the criteria for diagnosis of internet addiction in their scales.

The preferred websites by internet addicts are the two-way communication websites, which are chat rooms and community websites. For non-addicts, the preferred type of websites is the e-mail. These findings are similar to those of Young[18], who found that non-addicts predominantly used those aspects of the internet which allowed them to gather information (i.e., Information Protocols & E-mail). Comparatively, addicts predominantly used the two-way communication functions available on the internet (i.e., chat rooms and online games).

Also, it was found that internet addicts are at higher risk of having poor sleep, which is consistent with most of previous research. Young[18] has explained this association, he suggested that sleep pattern is typically disrupted due to late night log-ins. Dependents typically stayed up post normal bedtime hours and reported being on-line until two, three, or four in the morning with the reality of having to wake for work or school at six a.m. Such sleep deprivation causes excessive fatigue often making academic or occupational functioning impaired and decreases one's immune system leaving dependents vulnerable to disease.

Increasing time spent on internet per day is also a feature of internet addiction; this was also finding of Niemz et al.[16], and Nalwa and Anand[20]. This is most likely due to inability of adolescents to restrict their time online, especially when they engage in chat and community websites, and the availability of 24 hours internet service at homes.

Level of parents' control over internet at home is found more with non-addicts, as compared to addicts, which gives an inverse relationship to the internet addiction. Parents' control can be worsen by seriously disrupted relationship with their addicted children, because they gradually spend less time with real people in their lives for their increasing time in front of the computer. Our findings also suggest that increased levels of depression are associated with those who become addicted to the internet. These findings are consistent with the studies done by researchers like Shapira et al.[21], Young and Rodgers[22], and Petrie and Gunn[23].

It is likely that low self-esteem, poor motivation, fear of rejection, and the need for approval associated with depressed adolescents contribute to increased internet use. Depressed adolescents are drawn to electronic communication because of its anonymous nature, which allows them to talk with others through fictitious names and personalities. However, withdrawal from significant real-life relationships is a consequence of internet addiction. Therefore, the possibility exists that increased levels of social isolation subsequent to excessive time spent in front of a computer may result in increased depression. Therefore, further experimentation with a more comprehensive level of analysis is necessary to examine cause and effect.

Conclusion

In conclusion, Internet addiction is growing problem, which has psychological, physical, and social impact on adolescents' life, and requires preventive strategies as well as therapeutic interventions.

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