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Original Research Article

Escaping Online: Pathological Internet use among Medical trainees in Primary and Secondary Health Care in The Kingdom of Bahrain

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Abstract

By Far the most defining feature of the 21st century, the Internet, has become an integral part of our daily lives. So much so, that many of us have become pathologically addicted to its use. This cross sectional study attempts to examine the existence and possible effects of Internet addiction among medical trainees in the Kingdom of Bahrain. A total of 291 medical doctors were asked to fill the "Internet Addiction Diagnostic Questionnaire" developed by Dr. Kimberly Young. The prevalence of Internet addiction was found to be quite significant, proving that medical trainees are among high-risk pathological Internet use groups because they use the Internet for both educational purposes and non-educational purposes as found in the results. The Majority of the participants frequently stayed online longer than they intended. It was also found that many of the participants frequently neglected their household chores to spend more time online, blocked out disturbing thoughts about life with soothing thoughts of the Internet, found themselves anticipating when they would go online again, feared that life without Internet would be boring, empty and joyless and tried to cut down the amount of time they spent online but failed.

Keywords: Internet, Addiction, Medical, Bahrain, Pathological Internet Use.

INTRODUCTION

The Internet has come to be viewed as the defining tool of the 21st century. Whether it is information, communication or entertainment all can be found "online". As of March 2017, experts have calculated that there are more than 3.7 billion active Internet users worldwide [1]. This represents an increase of more than 1.2 billion active users since 2014 [2].

Prevalence of Internet use is usually higher in populations with higher economic and education levels [3]. For example, in 2004, South Korea, one of the world's strongest economies according to the Organization for Economic Cooperation and Development (OECD), had a 69.9% Internet penetration rate. Of all South Korean adolescents and young teens, 98% consider the Internet part of their daily lifestyle [4]. On the other hand, the total number of Internet users in India that has a large disparity in terms of wealth distribution was estimated to be 81 million (i.e. 6.9% of the total population) in 2010 [5].

Problematic internet use is defined as an individual's inability to control their internet use, which in turn leads to feelings of distress and functional impairment of daily activities [6]. Pathological internet use can also be classified as specific or generalized where Specific pathological internet use refers to particular content such as video games while generalized pathological internet use refers to overall internet use including, but not limited to chatting activities, email or social networking [7, 8].

A study in turkey indicated alarming prevalence rate of problematic Internet use among college students ranging between 5.9% and 18.3% [9]. Young adults and Medical students in particular tend to use the Internet to keep up to date with the explosive amount of information [10]. In China, juveniles account for about 60% of Internet users, representing the largest portion of Internet users. The rate of Internet penetration has reached 70% among urban citizens in China [3]. It is also worth noting that males in general, represent a greater proportion of Internet users than females [11, 12]. A recent study conducted in china reported that 70% of Chinese male citizens use the Internet as compared to 63% of female citizens [3].

The extraordinary growth of active Internet users has spurred concerns that the Internet was as addictive as gambling, alcohol or drugs [13, 14]. Epidemiological studies reveal that Internet addiction occurs in 1.4–17.9% of adolescents in both western and eastern populations. This indicates that Internet

addiction is a major mental health problem in adolescents worldwide [15]. A recent study has found that 6% to 11% of all Internet users in the United States are addicted to the Internet [16].

A similar study carried out in Korea on Junior High and High school Students found that 30% and 4.3% of students showed intermittent Internet addiction and Internet addiction respectively [17].

Internet use has both positive and negative aspects. The positive effects of Internet use include enhanced self-confidence, increased frequency of communication with family and friends, and feelings of empowerment [5]. On the other hand, negative effects of constant access to the Internet include sleep disorders, isolation from family members and community, refusing to answer calls, musculoskeletal pain, headache, eye irritation, depression, low quality of work, increased risk for carpal tunnel syndrome and even cardiac arrest [5, 18].

The American journal of psychiatry states that Internet addiction appears to be a common disorder that merits inclusion in DSM5 [18]. The DSM5 task force proposed a new category of addiction and related disorders encompassing both substance and non-substance addiction.

Although some authors suggest that addiction is not necessarily a disease; it's just a strong appetite for a rewarding behavior. This also means that what may be considered an addiction in one social-environmental location may not be considered as an addiction in another location [19].

Other authors agree that addiction is in fact a disease that alters species functioning both biologically and psychologically. One study has even found Orbitofrontal cortical alterations, mainly decreased thickness of lateral side in adolescents with Internet addiction reflecting a shared neurobiological marker of addiction-related disorders in general [20].

Furthermore, depression, anxiety, increased hostility, impaired sleep cycle and deteriorating family relationships are all major long-term negative consequences to pathological Internet use. These will ultimately affect the person's productivity, academic performance and quality of life on an interpersonal, social, occupational, psychological, and physical level [5, 9].

The estimated prevalence of emotional disturbance found in different studies on medical trainees was higher than that in the general population, in particular among females.

Many factors contribute to students vulnerability to stress such as their environment, the rigid system which encourages competition rather than cooperation between learners, faster acquaintance with changing technology, the psychological and developmental characteristics of young adulthood, feelings of independence, relatively limited or no parental supervision, exam stress and internet-dependent courses in terms of assignments and projects as well as communication with peers and mentors [18, 21, 22].

Internet addiction is becoming more prevalent in doctors undergoing training compared with general population. They are among high-risk pathological Internet use groups because they use the Internet for both educational purposes and non-educational purposes. Internet addiction can have a tremendous impact on medical trainees, the associated symptoms of mood and sleep disorders, as well as self-esteem issues can be damaging to their long-term success [2].

EXPERIMENTAL SECTION / METHODS

Research Aim

This study attempts to develop awareness regarding Internet addiction among medical trainees and its consequences on all their life aspects.

RESEARCH OBJECTIVES

- To study the pattern of internet use among medical trainees in Primary and Secondary Health Care in Bahrain
- To estimate the prevalence of pathological internet use among medical trainees in Primary and Secondary Health Care in Bahrain
- To study the impact of pathological Internet use on the academic, social and personal life of medical trainees in Bahrain.

Research Question

What are the patterns of Internet use and the prevalence of pathological Internet use and its impact on medical trainees in primary and secondary health care in the Kingdom of Bahrain?

Study Design

Cross sectional study.

Study Setting

The research was conducted in the kingdom of Bahrain in period between 2017-2018. Medical trainees were recruited to participate in the study from both primary and secondary training programs in the kingdom of Bahrain.

Study Population

291 medical doctors (75 family medicine trainees and 216 specialty medical trainees) during the training year 2017-2018.

Inclusion Criteria and Exclusion Criteria

All medical male and female trainees in both Salmaniya

medical complex and primary health care centers were included in the study except those who were on leave or refused to participate.

Sample Size

291 medical doctors (75 family medicine trainees and 216 specialty medical trainees).

Sampling Technique

Entire population has been selected due to small size.

Data Collection Tool (Questionnaire)

The questionnaire consists of two parts:

Part 1: Socio-demographic data such as age, gender, marital status and year of residency, and internet usage patterns such as internet experience, access device, access location, frequency, duration and motivations.

Part 2: The Internet Addiction Diagnostic Questionnaire developed by Dr. Kimberly young originally for the Internet addiction center, USA [23]. This is a commonly employed screening tool to examine pathological Internet use.

Formal Permission was obtained from Dr. Kimberly Young (founder of the internet addiction center) to use this questionnaire for the current study.

The Internet addiction questionnaire contains 20 questions that examine the manifestation of Internet addiction based upon a five-point Likert scale (0=Not applicable, 1=Rarely, 2=Occasionally, 3=Frequently, 4=Often, 5=Always). After all the questions were answered, the numbers for each response was tallied to obtain a final score. The higher the score, the greater is the level of addiction.

The severity impairment index is determined as follows:

- None: 0–30 points
- Mild: 31–49 points.
- Moderate: 50–79 points
- Severe: 80–100 points

Internet addiction scale demonstrated acceptable value on the alpha coefficient, with a 0.933, which indicates that it possesses a very good internal consistency and reliability.

Data Collection Procedure

Data were collected over a period of 2 weeks in 2018. A pilot study was conducted on 15 random subjects.

Each participant was briefed about the purpose of the study and personal confidentiality of the research before handing an envelope with their name on containing consent form and the questionnaire. Filling the questionnaire was considered approval for participation in the study. The questionnaire was then collected by hand without envelopes.

Statistical Analysis

Data was compiled and analyzed using SPSS 23 analysis software. Frequencies and percentages were computed for categorical variables. Mean, Median, SD, range, and interquartile range were computed for age and internet addiction test items. Overall mean and total scores were computed for the internet addiction test in relation to socio-demographic data. T test was used to determine whether there is a significant difference in mean scores between two groups if the sample size in both groups is greater than thirty. Kruskal Wallis test was used to determine whether there is significant difference in mean scores if the sample size in at least one group is less than thirty. Pearson correlation coefficient was used to investigate the significance of correlation between two quantitative variables. Spearman correlation coefficient was used to investigate the significance of correlation between an ordinal variable and a quantitative variable. In all statistical tests, p-value less than 0.05 were statistically considered significant.

Ethical Considerations

Data collected was kept confidential, accumulated data has been adequately stored and protected. Research protocol was submitted and approval was obtained from the ethical committee. For conducting the research, permission was obtained from the head of family residency program (Dr. Ebtisam Fakhro) and the head medical education and training in secondary care (Dr. Emtithal Al Jishi).

RESULTS AND DISCUSSION

Socio-Demographic Characteristics of Internet Users

As illustrated in Table-1, the study covered 291 participants. Females (61.5%) outnumbered males (38.5%). In our sample, (69.8%) fell into the 25-29 age group while the remaining (30.2%) were older than 30 years of age. Most were married, and worked in secondary health care. Mean age of responders was 28.8 SD (1.8) years (Range 25-37years).

Table 1: Socio-Demographic Data of Study Participants

		n	%
Gender	Male	112	38.5%
	Female	179	61.5%
	Total	291	100.0%
Age	25-29	164	69.8%

	30+	71	30.2%
	Total	235	100.0%
Marital status	Single	107	36.9%
	Married	182	62.8%
	Divorced	1	0.3%
	Widow	0	0.0%
	Total	290	100.0%
Year of residency	Year 1	82	28.2%
	Year 2	28	9.6%
	Year 3	126	43.3%
	Year 4	37	12.7%
	Year 5	18	6.2%
	Total	291	100.0%
Specialty	Primary health care	75	25.8%
	Secondary health care	216	74.2%
	Total	291	100.0%

Patterns of Internet Use

Table-2 shows that the majority of respondents (91.4%) have been using the Internet for more than 5 years. A total of 253 respondents (86.9%) accessed the Internet at home, whereas (57.7%) accessed the Internet at work. Even though 281 (96.6%) of the respondents reported to have internet access via their mobile phones, most (226 or 77.7%) preferred to access the World Wide Web through their PC or laptop.

Internet usage statistics revealed that 263 (90.4%) respondents used the Internet several times a day with 93 (32.1%) of them admit to having spent more than 4 hours a day online. Of the remaining 198 respondents, 47 (16.2%) used the Internet for 3-4 hours a day, 67 (23.1%) used the internet for 2-3 hours a day, another 47 (16.2%) used the Internet for 1-2 hours a day while the rest only accessed the Internet for less than one hour a day.

With regard to motivation, looking-up information for study and work purposes emerged as the most common Internet access motivation for the participants. The least common Internet activity was to "know and meet new people online". It should be noted, however, that the second most common Internet activity which the participants were involved in was messaging and online chatting.

Table-2: Internet Use Pattern (N = 291)

		n	%
Internet experience in years	<1	8	2.7%
	1-2	8	2.7%
	3-4	9	3.1%
	>5	266	91.4%
Access device	Laptop, Pc	226	77.7%
	Mobile phone	281	96.6%
	Tablet	163	56.0%
Access location	Home	253	86.9%
	Work, Training facility	168	57.7%
	Wifi hotspots	147	50.5%
	Other	87	29.9%
Frequency	Few times a month	2	0.7%
	Few times a week	5	1.7%
	About once a day	21	7.2%
	Several times a day	263	90.4%
Duration per day	<0.5 hour	8	2.8%
	0.5-1 hour	28	9.7%
	1-2 hours	47	16.2%
	2-3 hours	67	23.1%
	3-4 hours	47	16.2%
	>4 hours	93	32.1%
Motivations	Facebook or other social network	184	63.2%
	Looking for information for study or work	263	90.4%
	Downloading, viewing or listening to movies/ music	154	52.9%

	Messaging or online chatting	207	71.1%
	Emailing	174	59.8%
	Looking for information for non-work purposes	150	51.5%
	News	119	40.9%
	Online gaming	57	19.6%
	Knowing and meeting new people online	21	7.2%
	Others	28	9.6%

Internet Addiction Scale and Severity

The majority of the sample given, (30.6%) stated that they frequently stayed online longer than they intended. Approximately (19.2%) were always online longer than they intended, only four respondents (1.4%) stated that they only stayed online for as long as it was absolutely needed. It was also found that many of the participants (70.9%) more than occasionally "neglected their household chores to spend more time online". It was also worth noting that almost a third of the participants (37.2%) would more than frequently use the internet as a coping mechanism and that (37.5%), blocked out disturbing thoughts about life with soothing thoughts of the Internet.

It was also interesting to see that only (34.7%) of the respondents found themselves anticipating when they would go online again. This was followed up by the observation that more than frequently (41.9%) of the respondents feared that life without Internet would be boring, empty and joyless while (42.6%) of respondents tried to cut down the amount of time they spent online but failed.

On the average, not many of the participants had complaints about the amount of time they spent online with (73.2%) stating that they received such complains only occasionally or less. Grades and training program assignments did not seem to suffer because of the amount of time respondents spent online, nor did they feel that they had "snapped, yelled or acted annoyed if someone bothers them while they are online".

On the other hand, (32.6%) of the respondents more than occasionally lost sleep due to late night log-in while (19.6%) more than occasionally felt depressed, moody or nervous when they are offline; a feeling which goes away when they are online.

Table-3: Distribution of Answers in Internet Addiction Test (N = 291)

	Does not apply		Rarely		Occasionally		Frequently		Often		Always	
	n	%	n	%	n	%	n	%	n	%	N	%
Staying online longer than intended	4	1.4%	22	7.6%	56	19.2%	89	30.6%	64	22.0%	56	19.2%
Neglecting household chores to spend more time online	13	4.5%	72	24.7%	75	25.8%	84	28.9%	29	10.0%	18	6.2%
Choosing the excitement of the Internet to intimacy with your partner	100	34.4%	91	31.3%	47	16.2%	33	11.3%	15	5.2%	5	1.7%
Forming new relationships with fellow on-line users	75	25.8%	117	40.2%	49	16.8%	35	12.0%	11	3.8%	4	1.4%
Receiving complaints from others about the time you spend online.	34	11.7%	98	33.7%	81	27.8%	52	17.9%	15	5.2%	11	3.8%
Negative	51	17.5%	92	31.6%	78	26.8%	44	15.1%	19	6.5%	7	2.4%

effects of staying online on your grades or the training program assignments.												
Checking your email before doing something else than you need to do	26	8.9%	87	29.9%	71	24.4%	64	22.0%	26	8.9%	17	5.8%
Job performance or productivity suffer because of the Internet	48	16.5%	109	37.5%	76	26.1%	39	13.4%	15	5.2%	4	1.4%
Acquiring Defensive behavior when anyone asks you what you do on-line	53	18.2%	117	40.2%	57	19.6%	36	12.4%	24	8.2%	4	1.4%
Blocking out disturbing thoughts about your life with soothing thoughts of the Internet	54	18.6%	73	25.1%	55	18.9%	66	22.7%	29	10.0%	14	4.8%
Anticipating when you will go on-line again	48	16.5%	78	26.8%	64	22.0%	58	19.9%	30	10.3%	13	4.5%
Having fear that life without the Internet would be boring, empty, and joyless	33	11.3%	75	25.8%	61	21.0%	54	18.6%	44	15.1%	24	8.2%
Snap, yell, or act annoyed if someone bothers you while you are on-line	48	16.5%	114	39.2%	59	20.3%	44	15.1%	18	6.2%	8	2.7%
Losing sleep due to late-night log-ins	42	14.4%	87	29.9%	67	23.0%	45	15.5%	33	11.3%	17	5.8%
Preoccupied with the Internet	65	22.3%	92	31.6%	68	23.4%	42	14.4%	17	5.8%	7	2.4%

when off-line, or fantasize about being on-line												
Saying "just a few more minutes" when on-line	27	9.3%	51	17.5%	72	24.7%	78	26.8%	39	13.4%	24	8.2%
Attempts to cut down the amount of time you spend on-line and fail	36	12.4%	79	27.1%	52	17.9%	74	25.4%	35	12.0%	15	5.2%
Hiding how long you've been on-line	62	21.3%	97	33.3%	56	19.2%	47	16.2%	23	7.9%	6	2.1%
Spending more time on-line over going out with others	62	21.3%	118	40.5%	52	17.9%	30	10.3%	18	6.2%	11	3.8%
Feeling depressed, moody or nervous when you are off-line, which goes away once you are back on-line	60	20.6%	114	39.2%	60	20.6%	29	10.0%	23	7.9%	5	1.7%

In conclusion, the prevalence of Internet addiction is (59.1%). Approximately (35.4%) and (23.0%) of the participants were suffering from mild and moderate addiction, respectively and the subsequent consequences resulting from Internet usage (Table-4). It was noted that (40.9%) of the residents had no Internet Addiction and (0.7%) were suffering from severe Internet addiction.

Table-4: Severity of Internet Addiction

	n	%
None	119	40.9%
Mild	103	35.4%
Moderate	67	23.0%
Severe	2	0.7%
Total	291	100.0%

Relationship of socio-demographic data, pattern of Internet use with severity of Internet addiction

No significant difference was noted in the total score of Internet addiction between gender (p=0.979), marital status (p=0.288), year of residency (p=0.862) and specialty (p=0.992) as shown in (Table-5).

Table-5: relationship Between Socio-Demographic Data and Total Scores of Internet Addiction Test

		n	Mean	SD	Test	P-value
Gender	Male	112	37.43	18.33	T-test	0.979
	Female	179	37.37	16.65		
Marital status	Single	107	38.87	18.30	T-test	0.288
	Married	182	36.62	16.73		

Year of residency	Year 1	82	38.46	15.45	Kruskai Wallis	0.862
	Year 2	28	35.61	16.01		
	Year 3	126	36.50	18.38		
	Year 4	37	37.78	15.64		
	Year 5	18	40.78	22.83		
Specialty	Primary health care	75	37.41	15.31	T-test	0.992
	Secondary health care	216	37.39	17.95		

As shown in Table-6, there was no statistically significant correlation between the total score of Internet addiction and age (r=-0.087, P=0.186). However, there was statistically significant correlation between the total score of Internet addiction and duration of daily Internet usage (r=0.263, P=<0.001).

Table-6: Correlation between Total Score of Internet Addiction and Age in Years and Duration of Daily Internet Usage

		Total score
Age	Pearson Correlation	-0.087
	P-value	0.186
Duration	Spearman Correlation	0.263
	P-value	**<0.001**

DISCUSSION

A number of studies have been conducted around the world, especially among medical students regarding internet addiction. This study is a primary step towards understanding the extent of Internet addiction among medical trainees in kingdom of Bahrain.

The inconsiderable variance of the prevalence rates of internet addiction among medical trainees and students reported (Between 35% and 59%) [18] may be attributable to accessibility and acceptance of the internet and psychological predispositions (stressful work environment, long working hours and night shifts and residency programs requirements).

In our study participants have prioritized internet use for study and work purposes, this finding is not surprising since the internet has had a huge contribution to research, patient care, education and dissemination of healthcare information. The least common Internet activity was online dating, this is again not very surprising - taking in a consideration the lack of time and socio-cultural limitations. It should be noted, however, that the second most common Internet activity was messaging and online chatting, this could be explained by the revolutionized growth of social media and a way to release work related stress.

Significant discrepancies in results were noted regarding complaints received by participants enrolled in our study and a study conducted in the Malaysian university about the amount of time they spent online (18%) [18] as compared to (1%) reported by a study done in USA [18]. This could be attributed to the patriarchal structure of the societies in the Kingdom of Bahrain and Malaysia as well as the dependence of individuals on their families until marriage as compared to the cultural diversity and family situations usually found in the United States.

More than 50% of respondents reported that their academic performance was affected by their internet usage habit which seems to support the previously mentioned scientist's claim that non substance addiction such as internet addiction follows the same pathway as substance addiction. Similar data was observed from a study conducted on Malaysian medical students [18], however lower percentages was recorded by a number of studies conducted in the USA and Italy (less than 50%) [18] therefore managing Internet overuse among trainees is crucial for resident's productivity and wellbeing.

Several studies reported a positive correlation between abusive online users and mood disorders including depression, anxiety, and sleep disorders followed by poor performance. More than (35%) of participants in the current study acquired symptoms suggestive of mood alterations such as long compulsive internet use time with negative effect on social life and obligations, participants also exhibited hostile and defensive behavior, depressive and anxious thoughts and feelings when staying offline, as well as sleep deprivation and daydreaming with failed abstinence attempts. The current participants acquiring such tendencies are also in the same path of addiction.

Internet addiction was reported in (59%) of the cases, Mild internet addiction was seen in (35%) of study sample, which is comparable to outcomes reported from studies carried out in Asia, Europe and USA [18]. A slightly higher percentage of participants were noted to be suffering from moderate addiction (23%) as compared to other studies carried out in the

Middle East; (1%) of cases were reported to have severe addiction, which is similar to the findings observed in other Asian studies.

Limitations

This cross sectional study included only medical trainees in Salmaniya medical center and primary care and therefore the results of our study cannot be generalized. Moreover, as the study was a cross sectional study we could not finalize a cause-effect relationship between Internet Addiction and psychological impact among medical trainees. In order to establish a cause effect relationship a longitudinal study should be done to detect the fashion of Internet usage among medical trainees and its negative effects on trainees learning as well as their physical and mental health.

CONCLUSION

The present study concluded that the prevalence of Internet addiction is high and is comparable to international figures. Approximately half of the participants were suffering from mild and moderate addiction, and the subsequent consequences resulting from Internet usage.

The Majority of the participants frequently stayed online longer than they intended. It was also found that many of the participants frequently neglected their household chores to spend more time online, blocked out disturbing thoughts about life with soothing thoughts of the Internet, found themselves anticipating when they would go online again, feared that life without Internet would be boring, empty and joyless and tried to cut down the amount of time they spent online but failed.

Medical trainees are among high-risk pathological Internet use groups because they use the Internet for both educational purposes and non-educational purposes as found in our results. Internet addiction can have a tremendous impact on medical trainees, the associated symptoms of mood and sleep disorders, as well as self-esteem issues can be damaging to their long-term success. Appropriate prophylactic and interventional measures need to be initiated to encourage rational use of Internet in order to protect the physical and mental health of the users.

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