

Medical Students and Internet Addiction: A Study at Bolan University of Medical and Health Sciences Quetta, Pakistan

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Authors' contributions

This work was carried out in collaboration among all authors. Authors ZK and MYB designed the study, performed the statistical analysis and wrote the protocol. Author ZK wrote the first draft of the manuscript. Authors ZK and MYB managed the analyses of the study. Authors AZK and HS managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Objective: The use of internet is unavoidable in daily life. The young individuals are more prone to this condition. Beside many good benefits certain hazards are indicative richly observed in adolescent. The addiction test for internet usage is largely popular by using Internet Addiction Test IAT globally. This study is designed to assess and explore the internet addiction among Pakistani adolescents.

Methods: 300 medical students of Bolan University of Medical and Health Sciences aged from 18-25 years randomly selected for this study. Data collected based on scoring Internet Addiction Test 20 questionnaire. Factor categorization with Internet addiction assessment measured and analyzed according to age groups and gender specification.

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Results: The study results explored the addiction level of students. No sign of addiction seen in 32.33% (n=97) of students. Low and moderate level of addiction found in 46% (n=138) students and severe form of internet addiction seen in 21.66% (n=65) of medical students.

Conclusion: On the outcomes of current study, the measures should be seen for social and emotional behaviors and positive time given to internet use. Selected prevention measures should be planned for adolescent based on internet addiction.

Keywords: Internet; addiction test; medical students; adolescent.

1. INTRODUCTION

The revolutionary breakthrough in the form of internet changed the life of human being [1]. The pattern of life style especially of young people integrated internet as vital part of life thinking. High school and college students are using internet very regularly in daily life for amusement and academic motives. This significant internet existence in our youngster's life has created an internet addiction environment. This mount in internet usage cannot separate one's life by its non-constructive effects. Masses alarming devastating events related to internet addiction globally amongst young adolescent. Reports' indicating that internet addiction is an emerging psychological problem globally and has a direct impact on stress, anxiety and depression [2]. Challenging applications of internet comprises the experience of internet addiction. More than last two decades researches had in focus of internet and its addiction.

The internet addiction test by Dr. Young is authentic and widely used tool for researchers to detect problems linked with internet addiction [3]. 1996, was the year in which addiction study was started by Dr. Young and since then this tool is popularly in use by researchers globally. Dr. Young explained this as, "a person's incapability to manage his or her exercise of internet, which ultimately results psychological, social, institutional or workplace problems in a person's life [4]. Addiction of internet looks to be quite frequent behavioral addiction, and its occurrence has been roughly approximated just over or less than 10% in various studies [5,6]. Similarly, in studies carried out on health and medical students, analogous values have been resulted [7,8]. The obstacles faced by those who make use of internet heavily are grouped into five categorized: interpersonal relationship, academic, professional, physical and financial [9].

1.1 Internet Addiction Test

A protocol was made by Dr. Young for diagnosing the internet addiction problem by Internet Addiction Diagnostic Questionnaire (IADQ) which highlighted the following criteria for addiction [9]:

- Internet anxiety among individuals.
- For getting maximum satisfaction by using internet need to spend more and more time.
- Abandoned efforts to manage, lessen or disrupt the usage of internet.
- Depression and anxiety feelings if avoiding internet use.
- Sitting for a longer duration using internet.

Internet Addiction Test (IAT) comprises 20 questions based on IADQ. The presence and severity of internet addiction is measured through 20-item scale given by IAT. This IAT was intended for researchers to diagnose the problem. Internet addiction is explained as online compulsive behavior that originates hindrances in normal interfaces, encouraging strain, loneliness, nervousness and despair. Referring IAT results in some countries reports reflected that, in Italy research done on youngsters aged 14-21 years for addiction of internet resulted in no addiction 94%, mild to moderate addiction in 5% and high level of addiction seen only in 0.79% [10] while simultaneous type of research conducted in people aged 15-61 years in Mexico manifested the results as no addiction in 91.8%, at moderate risk are 8% and 0.2% are at high addiction of internet [11]. Another study conducted by Cheng and Li, in various countries the results found related to internet addiction that in Middle East its 10.9%, Southeast Europe 6.1% and North West Europe it is 6.1% [12]. Many studies reported different results especially major part of addiction comes through men [13,14,15] while few reflects the results in female internet addiction [16]. Chang in his study said that there is no any difference seen in internet level of

addiction between male and female persons [17].

1.2 Validation of Internet Addiction Protocol

Dr. K Young with her team recognized five subtypes of IAT which assessed behavioral control problems [18]. Clinicians and researchers have validated the importance of addiction tool due to its huge number projected in studies of various countries. Research practices in countries like, China [17], Italy [19], UK [20,21], Germany [22], Finland [23], France [24], Poland, [25], Greece [26] and Portugal [27] all proved importance of Internet Addiction Test. Medium to high level of addiction homogeneity noted in studies of these countries while China and Finland have some different outcomes.

The main aim of this research is to know the level of internet addiction and its dimensions on medical young students of an urban population of Pakistan basing IAT to establish adequate interpretation. The literature reviews that usage of internet is highly seen in young adolescents. Internet Addiction Test was applied to young medical students of a medical university in Pakistan after categorization of addiction. By irregular outcomes through IAT application on specific age groups irrespective of sexual differences we will interpret the level of addiction on male and female students both individual or collective bases. The findings of study will give us an enhanced perception of internet addiction among young adolescent population of Pakistan. The study findings can give us realistic suggestions for better planning interferences with young children to overcome problematic use of internet.

2. MATERIALS AND METHODS

This study was conducted during the months of November- February 2019-20 in medical students of Boaln University of Medical and Health Sciences Quetta Pakistan. Students were randomly selected from first year to final year MBBS and BDS classes. Cross sectional study design included 300 medical students with 18-25 years of age group. The distribution of students questioned in current study, according to age and gender specified in Table 3. Students were informed about internet addiction test (IAT) [28]. Students were given IAT questionnaire comprised of 20 questions.

2.1 Internet Addiction Test Tool

The Test for Internet Addiction (IAT) tool [9] was applied to assess the addiction in medical students. This test measures the addiction level by using 20 scales with a reply range of 0-5 points in answer (0=no reply, 1=rarely, 2=occasionally, 3=frequently, 4=often, 5=always). Questionnaire ranges from 0-100 points. The participants reply can be categorized in various sense of addiction. The outcomes of responses from, 0-19 explains No addiction, 20-39 an average internet user with low level of addiction, 40-69 shows a moderate level of addiction while 70-100 points shows sever level of addiction. Internal consistency reliability by Cronbach alpha (SPSS) on this study sample is 0.91.

2.2 Statistical Analysis

Statistical work for this study conducted using SPSS-25 of IBM. Confirmatory factor analysis Lavaan used for principal component analysis of IAT factor structure [29]. On the basis of IAT results the sample was separated in four categories. The scores of IAT factor was tested by Multivariate analysis of variance. Invariance was tested on single and three factor solutions before testing the gender differences measurement. For invariance measurement semtools package used [30].

3. RESULTS

3.1 Factor Arrangement

The 20 scale questionnaire specifies suitability for factor analysis. The value of coefficient is 0.92 (value=Kaiser Meyer Olkin KMO coefficient) which is quite acceptable for analysis of IAT results. According to Bartlet's test of sphericity expresses that correlation matrix are different significantly from 0. After looking at 300 correlations of IAT results almost all were statistically significantly ($p < 0.05$). Varimax rotation was used for major analysis of components. Initially three components were extracted and resulted for total variance of 52.74%. All components have greater saturation than .43 (ranged from .35 - .74). Single component saturation explained in Table 1. The component one is called lacking self control and neglecting work, second component is online life dependence-cognitive and emotional internet obsession and third component is social problems. For accurate sufficiency of IAT

outcomes three factors analyzed for confirmatory results. This three factor model is well fit to the current data of study. Root Mean Square Error of Approximation RMSEA= .070, CFI=.861, SRMR=.052 while ($\chi^2/df < 3$) Chi Square/df ratio is lower than 3. According to the theory all values are acceptable [31]. While conferring special focus on gender differences on IAT results, measurement invariance tested on three factors and one factor solutions.

3.2 Internet Addiction Level

To assess the internet addiction level of students, their replies were divided in four classes. A group of 32.33% (n=97) of students manifested no sign of addiction. Low and moderate level of addiction found in 46% (n=138) students and sever internet addiction found in 21.66% (n=65) of individuals. All description seen in Table 2 including mean with standard deviations of both male and female students assessed for IAT scores. Exclusion of three factors resulted in outcome of various factor scores for formulating the disparities in classes of gender and internet addiction on various components of IAT shown in Table 1.

The outcomes of multivariate analysis of variance (MANOVA) including addiction risk class and gender as independent and IAT score by factor as dependent variable highlighted in Table 5. Significant variables observed related to

IAT constituent (F=53.129; $p<.01$) and gender part (F=5.371; $p<.01$) while gender plus IAT class (F=.893; $p<.05$) was found not significant. The dissimilarities in the dimension of the effects where the results of variations for the cognitive and emotional concerns to the internet was tremendously soaring while for remaining two found very low.

This can be observed and said that in internet addiction risk utmost imperative part linked to cognitive and emotional concerns with internet while neglecting the work, social problems and self control lacking are less significant. By looking at divergences, a statistically significant multivariate outcome is observed due to which univariate effects have been noted. Vast variations have been seen during neglecting work, social problems and lacking self control, while in cognitive and emotional concerns with IAT scores no significant differences have been observed in this study.

4. DISCUSSION

Addiction of internet is a well recognized behavioral mess linked to an accelerated physical and mental mortality [32]. The severity of internet addiction is very high among young individuals. This study was aimed to assess the internet addiction level in medical students of Bolan University of Medical and Health Sciences Pakistan since can said to be one of the detailed prelude study in the country. Simultaneously this

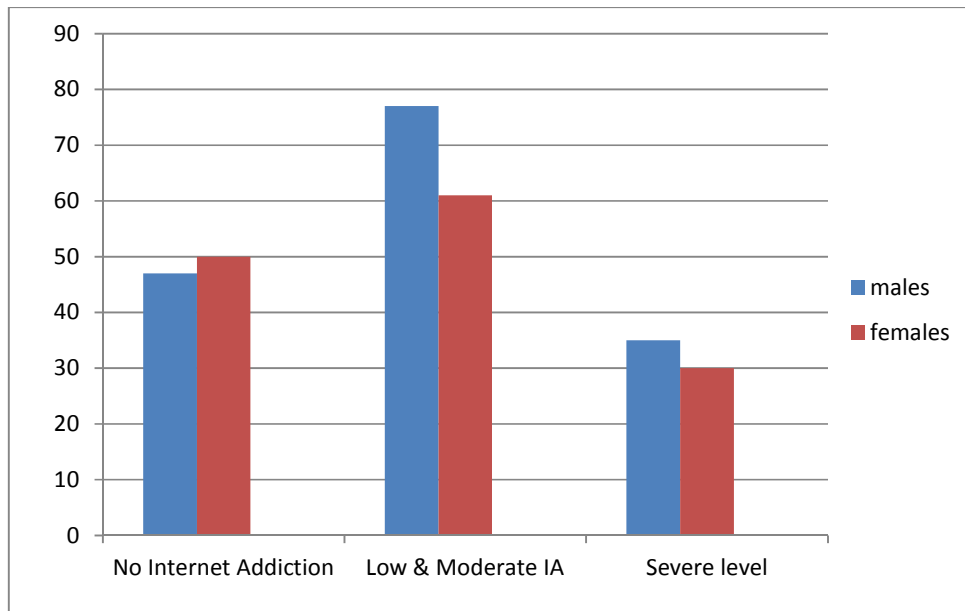


Fig. 1. Gender Variations on IAT scores according to number of students

Table 1. Internet addiction Test IAT scale factor structure

IAT Scales	Saturation of factor		
	F1	F2	F3
IAT 01 How often do you find that you stay online longer than you intended?	0.701	-	-
IAT 02 How often do you neglect household chores to spend more time online?	0.693	-	-
IAT 03 How often do you prefer the excitement of the internet to intimacy with your partner?	-	-	0.645
IAT 04 How often do you form new relationships with fellow online users?	-	-	0.623
IAT 05 How often do others in your life complain to you about the amount of time you spend online?	0.411	0.397	0.439
IAT 06 How often do your grades or school work suffer because of the amount of time you spend online?	0.718	-	0.318
IAT 07 How often do you check your email before something else that you need to do?	-	-	0.521
IAT 08 How often does your job performance or productivity suffer because of the internet?	0.776	-	-
IAT 09 How often do you become defensive or secretive when anyone asks you what you do online?	-	0.309	0.489
IAT 10 How often do you block out disturbing thoughts about your life with soothing thoughts of the internet?	-	0.401	0.371
IAT 11 How often do you find yourself anticipating when you will go online again?	0.320	0.628	0.332
IAT 12 How often do you fear that life without the internet would be boring, empty, and joyless?	-	0.609	-
IAT 13 How often do you snap, yell, or act annoyed if someone bothers you while you are online?	0.313	0.695	-
IAT 14 How often do you lose sleep due to being online?	0.479	0.491	-
IAT 15 How often do you feel preoccupied with the internet when off-line, or fantasize about being online?	-	0.731	-
IAT 16 How often do you find yourself saying “just a few more minutes” when online?	0.621	0.519	-
IAT 17 How often do you try to cut down the amount of time you spend online and fail?	0.603	0.449	-
IAT 18 How often do you try to hide how long you’ve been online?	-	0.644	-
IAT 19 How often do you choose to spend more time online over going out with others?	-	0.609	-
IAT 20 How often do you feel depressed, moody, or nervous when you are off-line, which goes away once you are back online?	-	0.790	-
Variance %	17	20	10
Cronbach alpha	459	093	083
	0.837	0.860	0.617

study is conducted by using standard data authenticated by any global research frame of its time. To exercise the fortitude of internet addiction level on mental dimensions of young medical students it was better to assume the IAT factor categorization. Different international

studies on internet addiction have manifested certain variations among factors [17,25,33]. Tri factorial structural dimensions has analyzed as principal part of IAT assessment of medical students.

- Cognitive and emotional concerns dependant on online streaming.
- Self control deficiency and lack of work interest.
- Social life barriers.

Such similar findings have been noted in the studies of [17,34,35] explained with the factor structural dimensions as did in current study. The results of this study have almost the same outcomes seen in Chinese study. Results in a study conducted in Germany also manifested such results [22]. Studies in Italy, UK, Finland, India, Croatia, Germany, China, Saudi Arabia and USA also proved the same results on these three factorial dimensions like in current study [20,22,35,36,37]. The outcomes of current study should be envisaged for its recommendations and disadvantages if any must be addressed for

onward research. To assess the internet usage this is also important to examine that time which is spent on internet. The query is whether the students are internet dependant in common rather than using for certain activities. Certain studies advocate that collective functions of internet are linked to its massive usage and involvement of students in collective online relevance manifest an addictive conduct affinity [16,38]. Current research did not know the time spent on different internet surfing focused for frivolous or educational activities. The least correlation related to general score on IAT is how frequently students overlook confidence with their fellow student. Regulation of internet obsession evaluates for diverse age classes is obligatory to facilitate all age groups. It is a question here that IAT test result diagnostic criteria and subject grouping should be the same

Table 2. Description by gender using data of internet addiction scores-risk applications

		Scores of IAT		Social problems		Emotional & cognitive concerns		Absent Self control & work ignorance	
		M	Sd	M	Sd	M	Sd	M	Sd
Female	No Addiction (n=50)	09.07	3.298	-.57	0.429	-1.21	0.590	-.69	0.651
	Low & moderate (n=61)	25.39	4.439	-.21	0.537	-.26	.977	0.09	0.979
	Severe level (n=30)	41.22	1.003	0.77	1.117	0.77	0.894	0.72	2.182
	Total n=141	29.87	14.372	-.12	1.004	-.37	.973	0.20	1.723
Male	No Addiction (n=47)	11.20	3.321	-.39	0.392	-.88	.404	0.70	0.812
	Low & moderate (n=77)	31.19	1.992	-.11	0.622	-.37	.711	0.32	0.511
	Severe level (n=35)	52.32	3.451	0.69	0.711	0.72	.552	0.05	0.726
	Total n=159	37.21	17.599	-.17	1.007	-1.01	0.911	-.71	0.877
Total Students									
	No Addiction (n=97)	12.39	2.97	-.81	0.662	-.51	.977	-.09	0.519
	Low & moderate (n=138)	31.37	6.39	-.29	0.433	-.91	0.510	-.11	1.002
	Severe level (65) n=300	49.21	2.79	0.55	.539	0.101	0.873	0.67	0.991
		30.91	19.266	0.89	1.221	0.02	1.001	0.07	1.299

Table 3. Description of participants by gender and age

	1 st year	2 nd year	3 rd year	4 th year	5 th year	Total
Girls	30	35	22	29	25	141
Boys	40	37	35	25	22	159
Total	70	72	57	54	47	300
Age M (SD)	18.02 (53)	19.0 (52)	20.57 (59)	21.91 (53)	22.87 (59)	21.0(1.12)

for all countries. Here it is obligatory to calculate cultural invariance IAT with addition of validation studies by using separate classes of students who reveals internet addiction symptoms in clinical circumstances. This is important as well to observe the occurrence of internet addiction indicators and obstacles linked to massive internet use to give a measure of problem recognition. Such observations are highly needed for inspecting the deterrence and interference programs.

Table 4. Replies to the questions of Young's IAT form (n and %)

Question	Never	Rarely	Occasionally	Often	Always
Q 1	120(40)	43(14.3)	54(18)	34(11.3)	49(16.3)
Q 2	94(31.3)	65(21.6)	65(21.6)	45(15)	31(10.3)
Q 3	89(29.6)	65(21.6)	54(18)	44(14.6)	48(16)
Q 4	103(34.3)	88(29.3)	54(18)	23(7.6)	32(10.6)
Q 5	119(39.6)	67(22.3)	44(14.6)	34(11.3)	36(12)
Q 6	101(33.6)	59(19.6)	65(21.6)	21(7)	54(18)
Q 7	99(33)	87(29)	77(25.6)	31(10.3)	06(2)
Q 8	131(43.6)	64(21.3)	43(14.3)	31(10.3)	31(10.3)
Q 9	87(29)	100(33.3)	64(21.3)	32(10.6)	17(5.6)
Q 10	122(40.6)	77(25.6)	59(19.6)	28(9.3)	14(4.6)
Q 11	129(43)	65(21.6)	73(24.3)	17(5.6)	16(5.3)
Q 12	97(32.3)	96(32)	77(25.6)	28(9.3)	02(0.6)
Q 13	137(45.6)	67(22.3)	40(13.3)	30(10)	26(8.6)
Q 14	117(39)	87(29)	54(18)	40(13.3)	02(0.6)
Q 15	120(40)	67(22.3)	74(24.6)	32(10.6)	07(2.3)
Q 16	111(37)	99(33)	50(16.6)	40(13.3)	00(00)
Q 17	100(33.3)	101(33.6)	34(11.3)	29(9.6)	36(12)
Q 18	91(30.3)	93(31)	66(22)	43(14.3)	07(2.3)
Q 19	78(26)	94(31.3)	87(29)	40(13.3)	01(0.3)
Q 20	104(34.6)	103(34.3)	63(21)	30(10)	00(00)
N %					

Table 5. Multivariate analysis of variables (dependent=IAT scores & factors) and (independent=gender categories)

Dependent variable	Independent variable	Univariate tests ηp^2	Multivariate tests ηp^2
Scores of IAT	Classes of IAT	.407**	.899**
Neglecting work			.321**
Emotional & Cognitive concern			.770**
Social problems			.201**
Scores of IAT	Gender	.097**	.007
Neglecting work			.010
Emotional & Cognitive concern			.042**
Social problems			.012*
Scores of IAT	Gender IAT classes	.019	.009
Neglecting work			.002
Emotional & Cognitive concern			.004
Social problems			.005

* $p < .05$, ** $p < .01$

5. CONCLUSION

Through this study it is revealed that selective projects should be planned for prevention of internet addiction levels in adolescent population. Psychosocial conceptual framework with behavioral problems of young individuals should be adopted and addressed for a better future planning.

CONSENT

As per international standard informed and written participant consent has been collected and preserved by the authors.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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