

Original Research Article

Internet Dependence, Fatigue, and Sleep Difficulties among University Students: A Cross-sectional Study

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Abstract

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Youth and young adults have already been exposed from the beginning of their lives to digital technologies, and so children and teenagers are heavily affected by this digital technology. They were called the generation of digital, or the Y generation. Research in six Asian nations found that 62 percent of young people have mobile phones, and about 68 percent of Hong Kong teenagers use the Internet every day to communicate. The cross-sectional study design is used in the study. This study is conducted in a private university. The study population is the students who are currently studying in university. A total of 386 out of 400 subjects were selected for data collection. The data was analyzed on SPSS version 21.0. Internet addiction prevalence is high in university students (71.20%). They are suffering in their grades and sleep too. There is a significant difference between internet addicted (internet hours use per day) and non-internet addicted. This study revealed that internet addiction is much higher among university students of the Islamic Republic of Pakistan. Overall, the level of internet addiction is moderate, not at a severe level. While the effect of internet addiction on the level of fatigue and sleepiness is revealed.

Keywords: Internet Dependence, Fatigue, Sleep, University, Students

INTRODUCTION

In recent decades, technological growth, especially digital technology, including internet networking has developed rapidly. Youth and young adults have already been exposed from the beginning of their lives to digital technologies and so children and teenagers are heavily affected by this digital technology. They were called the digital generation or the Y generation (Young, 2017)

Due to changes in modern society where parents are busier and are not able to monitor their children, academic achievement, working standards are exposed to wonderful technological advances that meet their needs and allow them to escape their problems. This generation is most likely to experience internet addiction. Since technology is an integral part of daily life, there is no clear distinction between inappropriate and efficient

use of the Internet. It can also be defined based on eight symptoms:

- I. Preoccupation: a strong desire for internet use and always thinking of previous online activities.
- II. Withdrawal: the feeling of boredom, anxiety, and mood disturbance after several days of internet inactivity.
- III. Tolerance: heavy use of the internet to get a certain level of pleasure.
- IV. Difficult to control: the continuous desire for the internet and inability to cutback, or control internet use.
- V. Disregard for harmful consequences: negligence related to psychological, physical problems related to long term internet use, whether they are persistent or recurrent
- VI. Loss of social communication and interest: loss of

concern in hobbies and social interaction and entertainment, just desire for internet use.

VII. Alleviation of negative emotions: excessive internet use to run away or alleviate mood swings or dysphoric moods i.e. vulnerability, responsibility, or nervousness.

VIII. Hiding from friends and relatives: covering up the truth related to internet use, like money spent on the internet, and time too, from family, friends, and therapists, etc (Kurniasanti et al., 2019).

China Internet Network Information estimated that 27.3% of the 485 million internet users are young people. Research in six Asian nations found that 62 percent of young people have mobile phones, and about 68 percent of Hong Kong teenagers use the Internet every day to communicate (Xu et al., 2020). As of June 2019, the number of internet users in China reached 854 million, reaching 61.2 percent. The faster internet access at lower prices fueled the growth of use, with a monthly average mobile data usage by a user of 7.2 GB, 1.2 times the world average, the study said. Compared to the last five years, the average mobile broadband download speed was approximately six times higher and the cost for mobile internet fell by over 90% (Xiaoxia, 2019).

The subject immediately became a more oriented and highly researched topic. Specific Internet use, such as online socialization, games, gambles, and sex, could lead to pathological misconduct (Kim et al., 2016). Prevalence among undergraduates worldwide is high for poor sleep quality, internet dependence, and depression symptoms (Nepal Telecommunication Authority, 2016)

However, Internet addictions in Nepalese undergraduate students have not so far been studied, but they can be estimated to be very widespread as most internet users are aged between 18 and 24, the typical undergraduate age group. The percentage of Nepalese between the ages of 18 and 25 who are affected by depression is also 5.61%. (Risal et al., 2016)

Students who suffer from sleeping problems spend more time watching TV and browsing social media pages. The most common symptoms for students who spend a long time on the internet are depression-related symptoms (Chen and Gau, 2016). Overuse of the internet may result in atrophy of grey matter in the brain, affect concentration, memory, and decision-making, and goals. Long term Internet usage may also cause psychological disorders, like Internet addiction, anxiety, and depression. Students with an Internet problem also can mask their sensitive and negative feelings like depression to escape negative or stressful events caused by excessive use of the Internet (Tan et al., 2016)

Individuals who have emotional and psychological problems like depression, anxiety, isolation, irritation, and a lack of sleep, can become addicted to online activity. Excessive Internet use can contribute to physical health conditions, such as dry eyes, CTS, repetitive movement injuries, pain in the hand, neck, back, and shoulder,

migraine, and thumb, index, and middle finger numbness and pain (Bener et al., 2018).

Yilmazsoy and Kahraman (2017) found that the degree of Internet dependence is linked to the length of internet use and the growing length of Internet use contributes to an increase in internet dependence. The sum of the active seconds was then separated by the number of days being used by the respondent over the duration, creating an average number of minutes of internet activity each day, taking into account only the days when internet use occurred. The internet was used for 126.27 minutes on average (Araujo et al., 2017)

Although the Internet "offers a fascinating place to observe relations and intimacy and to learn about them," it also allows spouses more opportunities to meet in acts that are not faithful in committed relationships (Vossler and Moller, 2019). Many who did not heavily use the Internet had better connections with their administration employees, higher academic qualifications, and better learning than internet addicts. Internet overuse could expose the students to their dark side such as spam, malware, hacking, phishing, private invasion, prostitution, etc (Javaeed et al., 2019). Organizations need to recognize not only to identify this stress but also how to fight social media before there's an important issue. Technostress is possible in conjunction with using social media in the workplace for non-work related activities and can adversely affect employee productivity (Brooks and Califf, 2017).

People adopt secretive information behaviors that can facilitate the positive navigation of information in risky and stressful circumstances (Fulton, 2019). There are indications that offline social network interaction is adversely linked with the use of social networking sites online. Behavioral variations have negative effects on subjective health, both fear of lack, and pathological Internet use. They affect personal and emotional well-being in specific. It implies that the use of social media influences subjective health not just because of what we are but also because of how we handle ourselves (Stead and Bibby, 2017).

For each teenager, it is necessary at least to have had a social media account to keep him or her up to date upon this globe. The use of the internet is linked to initial isolation and the use of the internet overtime lowers isolation. Loneliness is related to low performance, school suspension, fleeing from homes, and illegal activities such as voles, gambling, and crime (Rathakrishnan et al., 2018).

Students used social networking sites for social purposes than academic knowledge. The use of social media and technology among students enhances social interaction. The students consider social media "irresistible" in that they updated their websites before doing anything else, felt that their learning productivity was impaired by social networks, could not minimize their

social media time, received negative feedback from others about their social network use and felt stressed by the use of social networks (Akakandelwa and Gabriel, 2018)

A few medical students were not internet dependent, which is quite alarming for Pakistan because the internet is still not very cheap and super-fast. Those addicted to the Internet reported low academic results in comparison to non-addicted. Internet addiction is not yet formally declared mental illness, although it may be (Javaeed et al., 2019)

Sociodemographic factors serve as a potential indicators of Internet addiction (Aznar-Díaz et al., 2020). Students need frequent guidance on the possible consequences of internet addictive behavior and how to restrict their use of the Internet so as not to harm their academic activity and performance. They should use the Internet for promoting scholarships. Possible future negative effects of internet dependence should be aimed to balance the strategies of education and learning between virtual internet-based and well-tested conventional teaching methods (Yusuf et al., 2020). Indeed some behavioral potential for addiction may be especially high, including sex-related online problem activities, gambling, sports betting, or social networking (Laconi et al., 2015)

Internet addiction is a serious problem with negative physical and psychological effects. It involves greater self-esteem, while internet dependency can be related to depression and suicidal thoughts. Also, IA is associated with insomnia, apnea, nightmares and mental health disorders, depression and lower levels of performance in academia. IA can lead to a lack of physical inactivity, increased risk of depression and musculoskeletal problems (Dang et al., 2018). The Internet offers amazing opportunities, it provides us with knowledge, news, entertainment, etc. It is a valuable interactive tool that enables reasonable use of our everyday lives. For extreme behaviors, the use of social networking websites should be done cautiously in particular by young people (Kassiani et al., 2018)

Problem Statement

Internet dependence is very common among universities nowadays as the influence of social media and internet provision is free in university. Many students are scrolling social media throughout day and night to seek pleasure and kill time rather than doing any kind of physical activity. Therefore, internet dependence and its association to sleep quality, and fatigue need to be checked in university students.

Aim of the Study

This study aims to check out the level of internet dependence in the students and their quality of life, level of fatigue and sleep, and also check out the association between internet dependence, sleep problems, and fatigue among university students.

Objectives of the study

The objectives of the study are:

- I. Assess the level of internet dependence among university students.
- II. Assess the level of fatigue in internet-dependent university students.
- III. Assess the quality of sleep in internet-dependent university students.
- IV. Determine the association between internet dependence, sleep problems, and fatigue among university students.

Significance of the Study

This study will help to understand the internet dependency level among university students and tell about the hours a student spends on social media. This will also tell us about the level of fatigue and sleep disturbance among university students so that further actions should be taken by the authorities to decrease the internet dependence, fatigue, and sleep disorders in university students and their health and physical activity should be improved.

Research Hypothesis

H_0 = There is no significant relationship between the demographics (age, gender) and internet use.

H_a = There is a significant relationship between demographics (Age, gender) and internet use.

Study Gap

Internet addiction has become a major disorder among college and university students. Different studies are conducted to check out internet addiction in the general population worldwide and on college students in Pakistan. But no study is conducted on university students regarding internet addiction and the quality of sleep, fatigue in Pakistan.

RESEARCH METHODOLOGY

Research Design: The study design used in this study is the Cross-sectional Study Design.

Research Setting: This study was conducted at a Private University in Lahore city.

Target Population: The target population of this research includes the students of the university who are currently studying there, especially the undergraduates.

Sample Size

The sample size is calculated through the Cochran Formula Equation 1, which comes out 385. As the level of confidence is 95%, so Z on Z-score table is 1.96, at margin of error of 05% (0.05), p is the (estimated) proportion of the population which has the attributes in question and q is the remaining portion (1-p)

$$n = \frac{Z^2 pq}{e^2}$$

$$n = \frac{(1.96)^2 (0.5) (0.5)}{(0.05)^2}$$

$$n = 385$$

Sampling Technique

A non-probability convenient sampling technique is used during this study.

Research Instrument

The research instrument consists of five portions, one in the socio-demographics of the participants, the next part is the question related to testing their internet addiction by using the Internet Addiction Test (IAT), and the third part is related to their lifestyle, their daily habits, and the medical disorders, the fourth one comprised of Fatigue scale to check out their level of fatigue. The fifth and the last one is related to checking out their sleep by using the Epworth Sleep Scale. According to Benner et al. (2019). IAT has a Cronbach alpha of 0.89, the physical fatigue scale has 0.85 and the mental fatigue scale has 0.82. The Epworth sleep scale has a Cronbach alpha of 0.88.

Questionnaire

The first part consists of socio-demographics. This part consists of 13 questions which are the mixed one i.e. the MCQ type, and fill in the blank too. The second part is the internet addiction test, having a total of 20 questions on a 6 pointed Likert Scale. It is indicated the frequency of their internet use in different situations. "Always"

indicates that they are online all day (5), "Very frequently" (04), "occasionally" (03), "rarely" (02), "Very rarely" (01), and "never" indicates they aren't online throughout the day and has a score of 00). IAT is being used to check out the level of addiction, has the maximum score of 100 to a minimum of 00, 0 to 49 is categorized as normal, and 50-79 is categorized as moderate and 80-100 is categorized as the severe level addiction. A study has claimed that if a person uses the internet for more than 35hr per week, he will be declared an internet addict.

IAT consists of four factors. Factor 1 consists of nine variables (Q10 to Q13, Q15, and Q17 to Q20). It is concerned with behavioral attitudes related to internet addiction and non-internet addiction. The second factor consists of seven variables (Q3 to Q9). This is concerned with the effects of being online for a long time. The third factor consists of two variables (Q14, Q16). This is concerned with the controlling of time when you are online. The fourth factor also comprises of two variables (Q1, Q2). They are concerned with spending more time online. Cronbach's alpha of IAT scale was adequate as factor 1 = 18.76, factor 2 = 13.65, factor 3 = 12.18, factor 4 = 10.56 (Benner et al., 2019).

The lifestyle, dietary, and comorbid factors are of eleven items. Out of these eleven, eight (1-8) are related to medical disorders and co-morbid, with yes representing 1 and no as 0, 2 questions are dietary related and one is activity-related, and these are MCQ's.

The fourth one is the fatigue scale. It has two parts; the first one is physical fatigue questions (1-8) and the second one is mental fatigue questions (9-14) on the 04-Likert Scale, with 01 representing the better than usual, 02 representing more than usual, 03 representing the worse than usual, and the 04 representing the much worse than usual.

The last part is the Epworth Sleepiness Scale (ESS), which is used to assess daytime sleepiness. It consists of 8 questions and has a maximum score of 24. The score of 1 to 10 is considered normal while the score of 11 to 24 is considered abnormal. In the form of impairment, it has three classes, as <10 denotes no impairment, i.e. normal; 11-15 is moderate impairment, and 16-24 is a severe impairment.

Data Collection

The data is collected through a questionnaire. Permission is obtained from the participants. The questionnaire were presented directly to the participants and the completed questionnaire were collected later directly.

Data Collection Procedure

Step I: Before the data collection procedure, the permis-

sions were obtained from the setting authorities.

Step II: The researcher introduced himself to the students and participants.

Step III: By using the convenient sampling method, the questionnaire was distributed among the students during their free time i.e. during break time or the free lecture time. The time of one hour will be given to them to fill up the questionnaire.

Step IV: Informed consent will be obtained from all the subjects after explaining to them the purpose of the study and the contents of the questionnaire.

Step V: A total of four hundred questionnaires were distributed among the students. Out of these four hundred, three hundred and eighty-six questionnaires were selected, which were completed and not meeting the exclusion criteria.

Step VI: The collected data will be tabulated and analyzed on SPSS version 21.0.

Data Analysis

Data was analyzed by using the SPSS version 21.0 statistical software package. The demographics data were analyzed in the form of a percentage, frequency, and standard deviation in form of tables.

Ethical Considerations

The ethical rules for this research were set by The University of Lahore and the participants' rights were preserved until the end. Ethical approval was obtained from the Lahore School of Nursing, The University of Lahore. Written informed consent was obtained from every participant. All the information obtained was kept confidential and anonymity was maintained. Participants were informed that they can withdraw from the study at any time if they feel any disadvantage or risk during the study conduction. The questionnaires were kept under strict measures as they are kept in a locked cabinet and the soft files were protected by password and each questionnaire is given a specific number which is only known to the researcher.

RESULTS

Demographics

The demographics are given in table 1. The average age of the subjects is 21.25 ± 2.31 and the overall ratio of male and female is 39.38% and 60.62%. The overall prevalence of internet addiction is 71.2% in university students. The proportion of internet addiction was much in females as out of 234 females, 183 were internet-

addicted (78.20%) as compared to males 92 out of 152 (60.52%). In the case of university students, internet addiction is high in different departments. But non-medical students are at higher risk of internet addiction as compared to medical department students. The third and fourth-year students are highly addicted as compared to the first and second years. Those who are suffering from internet addiction are getting poor grades (06.50%) in university exams as compared to those who are not suffering from addiction (02.70%). However, most of the students whether they are addicted (44.0%) or not (42.3%) are getting good grades nearly equal. (Table 1, Figure 1)

In table 2, the IAT score and other variables i.e. Epworth Sleep Scale are compared among the internet-addicted and the non-internet addicted. The prevalence of headache and other medical comorbid is also compared among these two groups. The average score of the internet addiction test on Internet Addicted is 48.20 ± 14.94 which is high as compared to Non-Internet Addicted which is 33.95 ± 11.58 . The internet use hour per day on internet-addicted is 8.64 ± 3.69 which is very high as compared to non-internet addicted (3.19 ± 1.16). The fatigue physical symptoms are high on internet-addicted but the mental symptoms are a little bit higher in non-addicted ones. The average score of Epworth sleep score lies in the mild sleep impairment which is 10.16 ± 4.61 but of non-internet addicted is 07.94 ± 3.63 , which lies in no impairment. But 12% of internet-addicted are suffering from severe sleep impairment which is much higher while less than one percent are non-internet addicted ones. The frequency of eating food daily is much affected in internet-addicted subjects, about 09.5% of them are eating once a day, while in non-internet addicted, and it is 06.3%.

There is a high prevalence of headaches in internet-addicted subjects (74.5%) as compared to non-internet addicted (52.3%). This shows that the headache is highly associated with internet addiction. The other medical comorbid in internet-addicted ones are blurred vision (50.2%), double vision (38.5%), eye hurt (50.9%), eye tire (57.1%), dizziness (39.3%) and hearing problems (29.8%). While in non-internet addicted, these are not so common as a percentage of blurred vision, double vision, eye hurt, eye tire, dizziness and hearing problem are 37.8%, 29.7%, 39.6%, 35.1%, 36.0%, and 21.6% respectively. However, it is alarming that mental health issues are more common in non-internet addicted (20.7%) as compared to internet-addicted (15.6%).

In table 3, the fatigue scale components score is compared among the internet-addicted and non-internet addicted subjects. There is a significant difference between the physical symptoms of fatigue associated with internet addiction as compared to no internet addiction. The fatigue physical symptoms are more common as compared to mental symptoms because of

Table 1. Demographic Data

Variables	IA(275)	NIA(111)
Age	21.09 ±2.02	21.67 ± 2.90
Gender		
Male	92 (33.5)	60 (54.1)
Female	183 (66.5)	51 (45.9)
Department		
Nursing	61 (22.2)	24 (21.6)
Mechanical Eng.	29 (10.5)	33 (29.7)
Physiotherapy	17 (6.2)	03 (2.7)
Medical Imaging	11 (4.0)	00 (0.0)
Vision Sciences	14 (5.1)	04 (3.6)
Diet and Nutrition	19 (6.9)	04 (3.6)
Pharmacy	24 (8.7)	08 (7.2)
Business	07 (2.5)	04 (3.6)
Mathematics	06 (2.2)	02 (1.8)
Microbiology and Biotechnology	07 (2.5)	03 (2.7)
Sport Sciences	07 (2.5)	02 (1.8)
Lab Technology	10 (3.6)	01 (0.9)
Computer Science	05 (1.8)	03 (2.7)
BDS	10 (3.6)	05 (4.5)
MBBS	11 (4.0)	04 (3.6)
Psychology	07 (2.5)	02 (1.8)
Creative Arts	06 (2.2)	03 (2.7)
Public Health	07 (2.5)	00 (0.0)
Chemistry	05 (1.8)	03 (2.7)
Aviation	08 (2.9)	02 (1.8)
Biomedical Engineering	04 (1.5)	01 (0.9)
Year of Study		
1 st	38 (13.8)	11 (9.9)
2 nd	96 (34.9)	27 (24.3)
3 rd	96 (34.9)	53 (47.7)
4 th	36 (13.1)	18 (16.2)
5 th	09 (3.3)	02 (1.9)
Semester		
1 st	27 (9.8)	09 (8.1)
2 nd	11 (4.0)	02 (1.8)
3 rd	28 (10.2)	10 (9.0)
4 th	68 (24.7)	17 (15.3)
5 th	48 (17.5)	30 (27.0)
6 th	48 (17.5)	21 (18.9)
7 th	18 (7.3)	12 (10.8)
8 th	16 (5.8)	08 (7.2)
9 th	04 (1.5)	01 (0.9)
10 th	05 (1.8)	01 (0.9)
Degree		
BS	274 (99.6)	104 (93.7)
MS	01 (0.4)	07 (6.3)
Family Income		
<25000PKR	61 (22.2)	16 (14.4)
25001-35000PKR	50 (18.2)	13 (11.7)
35001-50000PKR	90 (32.7)	34 (30.6)
>50000PKR	74 (26.9)	48 (43.2)
Father Education		
Primary	44 (16.0)	27 (19.8)
Secondary	51 (18.5)	16 (14.4)
Intermediate	62 (22.5)	37 (33.3)
University	118 (42.9)	36 (32.4)
Father Occupation		

Table 1. Continue

Not Working	31 (11.3)	12 (10.8)
Worker	84 (30.5)	38 (34.2)
Businessman	71 (25.8)	34 (30.6)
Government Officer	89 (32.4)	27 (24.3)
Rank in university exams.		
Very Good	52 (18.9)	24 (21.6)
Good	121 (44.0)	47 (42.3)
Average	84 (30.5)	37 (33.3)
Poor	18 (6.5)	03 (2.7)
Frequency of watching TV.		
Never	49 (17.8)	24 (21.6)
Rarely	72 (26.2)	38 (34.2)
Sometimes	128 (46.5)	39 (35.1)
Always	26 (9.5)	10 (9.0)
Any type of physical activity.		
Yes	172 (62.6)	75 (67.6)
No	103 (37.5)	36 (32.4)
No of bedrooms	4.22 ± 2.11	4.63 ± 2.54
The number of people living.	6.44 ± 3.44	6.87 ± 3.73
Hours of internet use per day.	8.64 ± 3.69	3.19 ± 1.16
Sleep duration/day	7.52 ± 2.16	7.23 ± 1.91
TV Hours/day	2.02 ± 2.26	1.19 ± 1.38

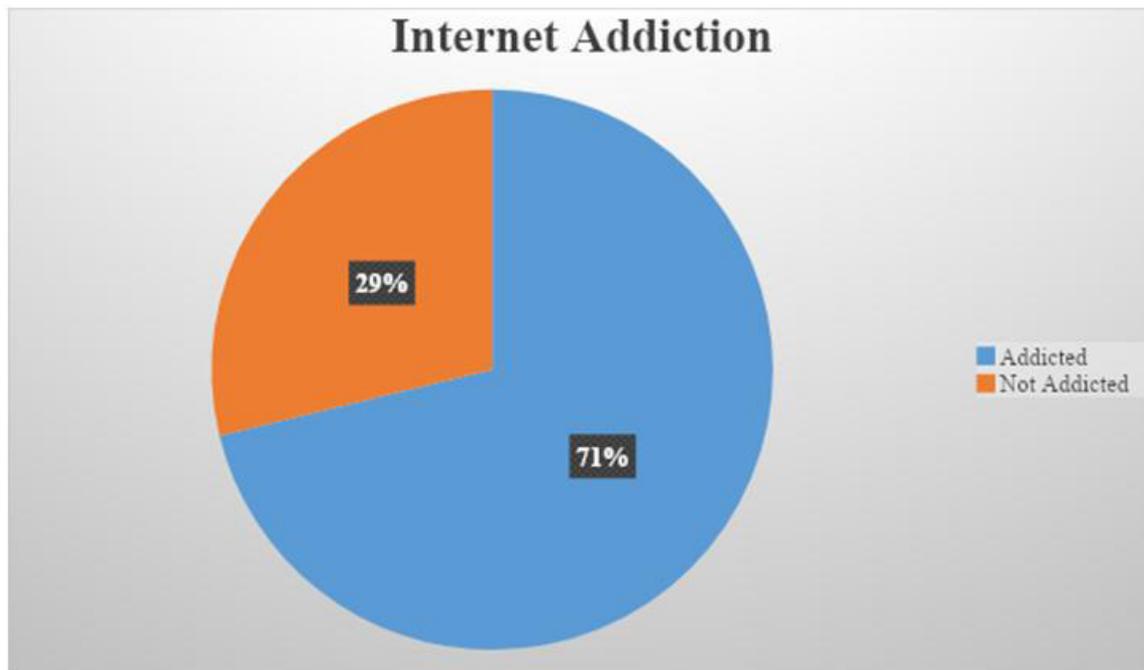


Figure 1. Prevalence of Internet Addiction among Student

Table 2. Life Style, Dietary and Comorbid Factors Characteristics between Internet Addicted and Non Internet Addicted

Variables	IA (275)	NIA (111)
IAT Score	48.20 ± 14.94	33.95 ± 11.58
Physical Symptoms	18.18 ± 04.37	16.24 ± 04.02
Mental Symptoms	13.28 ± 03.67	14.33 ± 04.36
Epworth Sleep Score	10.16 ± 04.61	07.94 ± 03.63
Medical Co-morbid	f (%)	f (%)
Headaches	205 (74.5)	58 (52.3)
Blurred vision	138 (50.2)	42 (37.8)
Double vision	105 (38.5)	33 (29.7)
Eyes hurt	140 (50.9)	44 (39.6)
Eye tire	157 (57.1)	39 (35.1)
Dizziness	108 (39.3)	40 (36.0)
Any problem with hearing	82 (29.8)	24 (21.6)
Mental Problem	43 (15.6)	23 (20.7)
Epworth Sleepiness Scale		
Normal	127 (46.2)	70 (63.1)
Moderate	115 (41.8)	40 (36.0)
Severe	33 (12.0)	01 (0.9)
How frequently you eat fast food?		
Daily	57 (20.7)	14 (12.6)
Weekly	128 (46.5)	38 (34.2)
Monthly	32 (11.6)	22 (19.8)
Occasionally	58 (21.1)	37 (33.3)
Frequency of eating food daily		
One time	26 (09.5)	07 (06.3)
Two times	100 (36.4)	41 (36.9)
Three times	115 (41.8)	50 (45.0)
Four times	34 (12.4)	13 (11.7)
How are your daily routine activities?		
No activity	47 (17.1)	22 (19.8)
Mild activity	117 (42.5)	27 (24.3)
Moderate activity	101 (36.7)	53 (47.7)
Vigorous activity	10 (3.6)	09 (8.1)

Table 3. Physical and Mental Symptoms of Fatigue

14 Item Fatigue Scale	IA (275)	NIA (111)
Physical symptoms		
Have problems with tiredness?	2.00 ± 0.85	1.87 ± 0.82
Need to rest more?	2.23 ± 0.87	1.87 ± 0.78
Feel sleepy or drowsy.	2.14 ± 0.79	2.14 ± 0.88
Have problems in starting things?	2.33 ± 0.92	2.13 ± 0.82
Start things without difficulty but get weak as you go on.	2.23 ± 0.86	2.27 ± 0.92
Lacking in energy?	2.40 ± 0.90	1.99 ± 0.83
Have less strength in your muscle?	2.29 ± 0.84	2.09 ± 0.96
Feeling weak.	2.26 ± 0.89	1.87 ± 0.84
Mental symptoms		
Have difficulty in concentrating?	2.08 ± 0.91	1.99 ± 0.92
Have problems thought clearly?	2.23 ± 0.89	2.00 ± 0.97
Make flips off the tongue when speaking?	2.20 ± 0.92	2.13 ± 1.06
Find it more difficult to find the correct word?	2.29 ± 0.91	2.14 ± 0.94
How is your memory?	2.16 ± 0.94	2.08 ± 0.96
Lost interest in the things you used to do?	2.32 ± 1.04	2.11 ± 1.05

Table 4. Multiple Stepwise Regression Analysis Predictor for Internet Addiction

Independent Variable	B	Standard Error	Beta	t-test value	P value
Internet use in hour	0.155	0.173	0.040	0.896	0.371
Sleeping in hours	-0.23	0.339	-0.003	-0.066	0.947
Fatigue Physical Symptoms	0.844	0.210	0.238	4.022	<0.01
Fatigue Mental Symptoms	-0.005	0.238	-0.001	-0.020	0.984
Epworth Sleepiness Score	0.779	0.175	0.224	4.445	<0.01
Mental Disorder	0.209	2.046	0.005	0.102	0.919
Headaches	-1.433	1.665	-0.043	-0.861	0.390
Blurred Vision	-6.294	1.625	-0.204	-3.874	<0.01
Double Vision	-3.237	1.714	0.101	1.889	0.060
Eyes Hurt	-3.730	1.845	0.121	2.022	0.044
Eye Tired	-3.305	1.665	-0.107	-1.985	0.048
Dizziness	-7.330	1.528	-0.236	-4.798	<0.01
Hearing Problem	-2.116	1.735	-0.063	-1.219	0.223

the large time of internet use per day and the mental symptoms of fatigue are also comparable in both IA and NIA with each other. In internet-addicted, the minimum average score in fatigue scale is 2.00 ± 0.85 , which belongs to "Do you have problem with tiredness?" while the maximum average score is 2.40 ± 0.90 belongs to "Are you lacking energy?" However, in Non-internet Addicted, the maximum score is 2.27 ± 0.92 and the minimum score is 1.87 ± 0.78 , which belongs to "Do you start things without difficulty but get weak as you go on?" and "Do you need to rest more?", respectively. In table 4, the multiple regression analysis is used to check out the potential predictors of internet addiction. This analysis demonstrated that the fatigue physical symptoms, sleepiness assessed by Epworth Sleepiness scale, Blurred vision, Dizziness are the possible predictors of internet addiction, i.e. they are significantly associated.

DISCUSSION

In this study, the overall prevalence of internet addiction is found to be 71.20%, while among the gender its prevalence is 78.20% in females and 60.52% in males. Internet addiction is higher in females as compared to males. These results are comparable with the study conducted in Pakistan, they found the female participants (57.4 %) were more addicted to the internet as compared to males (42.5 %). They also found that internet addiction prevalence was 85% among the students (Ahmer and Tanzil, 2018). These results are much higher as compared to the world but some were lower than Pakistan, as 58.87% were addicted in India, (Saldanha et al., 2015), as 54.05% in Tunisia, (Mellouli et al., 2017), 47.6% in Mauritius (Smita and Azhar, 2018), 51.4% in KSA (Abdel-Salam et al., 2019), 80.10% in Sudanese (Altayeb, Shumo, and Malik, 2018). In Pakistan, there is a

major concern related to the security of children. Due to this reason, Parents don't allow them to go outside from home, due to which they are confined to home. When they move to college and university for further studies, they use the internet to seek pleasure rather than going outside and spending time with other mates (Chen and Gau, 2016)

Only 6.50 % of internet-addicted participants' grades were poor while a study conducted in Turkey claimed that 10.10% of participants were having poor grades (Bener et al., 2018). A study conducted in Nepal found that internet addict students spend an average of 11 hours a day, compared to the 8.63 hours as claimed in this study (Karmacharya et al., 2019).

In this study, the average score of the internet addiction scale in non-internet addicted is 33.95 with an SD of 11.58, while a study in Turkey shows the average score of 43.80 with an SD of 12.95 (Bener et al., 2018) while a study conducted in China showed an internet addiction scale score of 58.19 ± 6.9 among internet-addicted while this study showed an average score of 48.20 ± 14.94 (Xin et al., 2018). A study conducted in Iraq showed that the prevalence of poor sleep among internet-addicted student is 11% (Alamer et al., 2020) and 26.7% in Vietnamese Students (Zhang et al., 2017). Average Sleep hours per days among internet-addicted adolescents of Turkish Population is 6.05 with the standard deviation of 1.09. 33.00% of them eat fast food on weekly basis, 7.9% shows vigorous activity on daily basis (Bener et al., 2019). In this study, the 3.6% of the internet-addicted students showed vigorous activity on a daily basis, 46.5% eat fast food once a week, and 12.00% have severe sleep incontinence. The prevalence of eye blurring (55.9%) and headache (47.8%) in Sudanese is near to our study results where eye blurring is 50.2% and headache is 74.5% of internet-addicted (Altayeb et al., 2018).

In undergraduate students, the presence of internet

addiction, depressive symptoms, and poor sleep quality at the same time suggest that their control over internet use with poor sleep could be beneficial to compensate for the higher likelihood of bearing depressive symptoms. This study confirms that one out of three undergraduate students in meeting the criteria of poor sleep. This can be recognized as to change in sleep pattern in the study years. The physiological needs for sleep are not adequate with the quality of sleep during this period (Bhandari et al., 2017).

The average score of the Epworth Sleepiness Scale on internet-addicted was found to be 10.64 with an SD of 4.79 and in non-internet addicted, the score was 6.97 with an SD of 3.89. These study findings were among the health care workers in India. However, in the present study, the results are comparable with the previous findings as 10.16 with SD of 04.61 and 07.94 with SD of 03.63 among internet-addicted and non-internet addicted students, respectively (Mamidipalli et al., 2019).

The 14 item fatigue scale was used in a study conducted in Qatar among school students. They found that the average score of Fatigue Physical Symptoms among internet-addicted students was 27.25 with a standard deviation of 02.44 and Fatigue Mental Symptoms average score among internet-addicted school students was 16.19 with an SD of 02.88. However in our study, both these scores are found to be, 18.18 and 13.28 among addicted students with the SD of 04.37 and 03.67, respectively. When these scores were checked in non-addicted, these are also near to Qatar students' scores of mental fatigue (14.62 ± 3.22) and physical (19.23 ± 03.13) symptoms. The average mental fatigue symptoms score found in this study is 14.33 ± 04.36 and the physical symptoms score is 16.24 ± 04.02 . (Bener et al., Bhugra, 2016). The prevalence of dizziness and hearing problems is also comparable as Qatar internet-addicted students have a prevalence of 28.0% and 25.4% respectively. However, in this study, the prevalence is 39.3% (dizziness) and 29.8% (hearing problem) (Bener et al., 2016).

A study conducted in India in 2019 reported a significantly high prevalence of doubled vision in 28.9% of adolescent students who are suffering problematic internet use. While this study found the prevalence of 38.5% (Ichhpujani et al., 2019), eyeing tire prevalence is 57.1 in this study but the previous study reported it up to 67% of internet-addicted.

CONCLUSION

This study revealed that internet addiction is much higher among university students of the Islamic Republic of Pakistan as it comes out to be 71.24%. Overall, the level of internet addiction is moderate not at a severe level. While the effect of internet addiction on the level of

fatigue and sleepiness is revealed. Those who are suffering from internet addiction have some level of fatigue and physical symptoms but the fatigue mental symptoms are more common in non-internet addicted people. The internet-addicted are suffering their grades in the university as they are spending most of the time on the internet. The Internet-addicted is also suffering from sleep. Headache is the common co-morbidity on the internet-addicted, but also have others like eye weakness, which is the second most common co-morbid.

RECOMMENDATION

As the level of internet addiction is very high in university students, so it is recommended to conduct a study at the national or provincial level to check out the internet addiction of university-level students. So this study should be extended to other private and government universities.

Limitations of the Study

Limitations of the study are:

1. The sample belongs to a single university so the results can't be generalized to the whole country.
2. The study is limited due to a lack of funding and resources.
3. The commonly used criteria for internet addiction is used in the study, as it is mostly a used criteria but it is an outdated one.

Conflict of Interest

No conflict of interest has been declared by the authors.

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