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## **A study about frequency, distribution and determinants of internet addiction in medical students of Khyber Pakhtunkhwa, Pakistan**

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**Abstract**---Background: Due to ease of access and affordability, globally 4.95 billion people are using the internet for multiple purposes. However, this use has resulted in the emergence of some novel problems. Because of intense academic pressure, Medical students is susceptible to internet addiction. Internet addiction among medical students is growing concern among medical students, potentially impacting their academic performance, mental health and overall well-being. Objective: Our objectives were to find the frequency and distribution of internet addiction by gender and type (public/private sector medical students) in medical student of Khuber Pakhtunkhwa. Methodology: This analytical cross-sectional study was conducted at Gomal Medical College from May 10, 2022, to July 10, 2022. A sample size of 365 was calculated using the Raosoft SPSS calculator. The sampling procedure was conducted through the non-probability consecutive technique. The data collection was carried out by using Young IAT scoring criteria, with all categorical variables taken into account. The research variable was the categorical classification of different internet usage behaviors, and demographic variables were sex and the type of medical student of all public and private sector medical colleges. Frequency, percentages and 95% CI were interpreted for categorical variables. The Chi-square test of association was used to find an association between variables. Result: There were 365 total participants. Out of these 365 participants, 205 (56%) were male and 160 (43.8%) were female. Of the participants, 226 (61.9%) belonged to the public sector and 139 (38.1%) belonged to private medical colleges. According to the Young's IAT form filled by all the participants, 172 (47.1%) were normal users 173 (47.4%) were problematic users with a 95% CI of 42-52% and 20 (5.8%) were internet addicts with 95% CI of 3-8%. There was no statistically significant association between internet addiction with sex and the type of students with a p-value of 0.589 and 0.654 respectively at an alpha level of 0.05. Conclusion: In our study, there was no significant

association between internet addiction with gender and the type of medical student.

**Keywords**---Internet addiction disorder, medical students, technology addiction, internet usage behaviors.

## Introduction

In this era of modern technology, the internet is one of the most important handy tools that is used for multiple purposes viz. study, business, entertainment, gaming, shopping, etc. The facility of internet after its invention has increased the pace of human life and made the world with enhanced innovation and advancement<sup>1</sup>. The Internet was first used in 1960 by the US military to perform its operations. Afterward, the use of the Internet increased immensely. In the past 20 years, the Internet has become the most important part of human life a handy tool for executing different tasks, and a simple source for communication and social interaction<sup>2</sup>. Due to ease of access and ease of affordability, Internet users are increasing day by day at a very high pace, and its positive impact is being overshadowed by its harmful effects<sup>3</sup>. According to the World Health Organization (WHO) generally, the term addiction is referred to as: "the psychic and sometimes even physical condition arising from the interaction between a living organism and an exogenous substance characterized by behavioral responses and other reactions that always include a compulsive need to take the substance continuously or periodically, to get its psychic effects or to avoid the distress related to its withdrawal"<sup>4</sup>. Considering the idea of the general behavior and pathological addiction, the Internet Addiction is defined as: "the inability to control the use of the Internet that leads to a feeling of pressure, anxiety and dysfunctional behaviors in everyday activities" The negative use of the Internet by young people has to lead them to problems involving mental and social health relative to symptoms of addiction<sup>5</sup>. Dr. Ivan Goldberg first introduced the term Internet Addiction under the description of "the pathological and compulsive use of the Internet". Firstly, it was considered solely as behavioral addiction involving most of the diagnostic symptoms relating to addiction Later on after studying the cognitive-behavioral model of pathological Internet use it was concluded that the behavioral element of addiction is more pronounced as compared to pathological symptoms, in this case, so the term internet addiction was replaced by "Problematic Internet Use". "Problematic Internet Use" (PIU) is a multidimensional syndrome involving cognitive and behavioral symptoms resulting in negative effects on social, academic, and professional performances<sup>6</sup>. 4.95 billion people around the world are using the internet in January 2022 which is equivalent to 62.5% of the world's population. There were 61.3 million internet users in Pakistan in January 2021. The number of users increased by 11 million (21%) between 2020 and 2021. With the increased availability of the internet in our country, our young generation which makes up almost 60% of the country's population is spending most of their valuable time on the internet without knowing the negative impact this engagement may have<sup>7</sup>. India contributes the second largest internet users with more than 460 million online users and it is projected that by the year 2021, the numbers will further increase to around 635.8million<sup>8</sup>. With the ability to access the internet from anywhere, at any time,

paired with an enormous variety of internet activities in which youth engage (e.g., social networking, chatting, streaming videos, watching movies) increased instances of problematic internet behavior have emerged. Most of the symptoms associated with internet addiction are not specific. Still, they may include disturbance in the sleep-wake cycle, chronic fatigue (due to usage of the internet all night), abnormal appetite, reduced self-care, headache, visual problems, back pain, and in some predisposed patients' seizures may occur due to continuous visual stimulation of digital devices such as mobiles, laptops, Ipad, computers. However, internet use is considered to be pathological when most of a person's time and energy is spent while using the Internet or related activities and provokes personal, relational, emotional, familial, and social maladjustment<sup>4</sup>. Major risk factors relating to Problematic Internet Use include poor social support, inadequate or disturbed parental environment, and social isolation.<sup>3</sup>

Internet addiction adversely affects mental health and leads to other activities affecting the physical health of people. A study comprising 1641 patients suffering from Internet Addiction and 11210 healthy controls found that Internet Addiction was significantly associated with alcohol abuse, depression, and anxiety, Internet addiction may be associated with other forms of addiction including smoking and alcohol dependence. Along with psychological issues, Internet addiction causes physical problems too, including back pain and strain injuries.<sup>3</sup>

BhushanChaudhari in their paper has presented a cross-sectional study aimed at identifying the prevalence of internet addiction among medical students in India. They have used the questionnaire and the methodology presented by Kimberly Young to identify internet addiction. According to the results, about 58.87% of students suffered from internet addiction out of which 51 were classified into the mild addiction category and the rest into the moderate addiction section. The factors presented for the addiction were being male gender with the reason being their higher involvement in gaming, seeking intimate relationships on the internet, and gambling. Other factors that were presented involve private accommodation and the use of the Internet at an early age. The authors concluded with an emphasis on building a university-level program to create awareness among students regarding addiction<sup>9</sup>. Zhang presented a meta-analysis, which is a statistical technique to estimate a pooled effect size, for the prevalence of Internet Addiction among medical students across different countries. The authors have combined results from studies conducted across different countries based on a certain criterion which included only Undergraduate students, and a validated questionnaire, and the main outcome of the study was IA in medical students. The pooled prevalence from 10 studies, hosting responses of a cumulative 3651 medical students, internet addiction stood at a staggering 30.1%. This is such a high number compared with Internet addiction among the general population which stood at 8%. The author shave presented different reasons for this high prevalence such as the use of the internet to relieve academic stress, frequent use of the internet for academic research, and last but not least using the internet as a strategy to combat depression and stress which could be a factor in internet addiction as students then distance themselves from other people<sup>10</sup>.

### Research Problem & Knowledge Gap

Previously a cross-sectional study was conducted to check the prevalence of Internet addiction among the medical students of Gomal Medical College.<sup>2</sup> This study was restricted to Gomal Medical College only, which is located in region D.I Khan. But now we'll conduct our study on a broader level, our study population will be students of all medical colleges of Khyber Pakhtunkhwa covering most of the regions of the Province.

### Research Objectives

The objectives of our research project were to determine:

**RO1:** The frequency of internet addiction in the sample and population of medical students of KPK Pakistan.

**RO2:** The distribution of internet addiction by gender in the sample and population of medical students of KPK Pakistan.

**RO3:** The distribution of internet addiction by type of students (public/private) in the sample and in the population of medical students of KPK.

**RO4:** To find any statistically significant association of internet addiction among the students of public and private medical colleges of KPK.

**RO5:** To find out any statistically significant association of internet addiction with gender.

### Null Hypothesis

The following are our five null hypotheses for a research project:

**H1:** The observed frequency of Internet addiction among medical students of KPK is the same as the expected frequency.

**H2:** The observed frequency of distribution of internet addiction is the same as expected across genders.

**H3:** The observed frequency of Internet addiction is the same as expected across different types of students (public/private).

**H4:** There's no statistically significant association of internet addiction between public and private medical students.

**H5:** There is no statistically significant association of internet addiction with gender.

### Alternative hypothesis

The following are our five alternate hypotheses for a research project

**H1:** The observed frequency of internet addiction among medical students of KPK is significantly different from the expected frequency.

**H2:** The observed frequency of Internet addiction is significantly distributed regarding gender.

**H3:** The observed frequency of Internet addiction is different across different types of students (public/private).

**H4:** There's a statistically significant association of internet addiction between public and private medical students.

**H5:** There's a statistically significant association of internet addiction with gender.

## **Significance**

The research that was previously done on internet addiction among medical students of KPK was limited to only one medical college. Now we have extended our research to the students of all medical colleges (both public and private) of KPK. The significance of our research is that have found the prevalence of normal users, problematic users, and internet addicts among medical students of KPK. After conducting this research, we can compare the prevalence of internet.

Addiction in KPK with other provinces of Pakistan. In this study, we also the distribution internet addiction by age, gender, residence, and public and private medical college. After this research primary data obtained can use by different planners for inform decision-making and devising strategies to combat any problem in the future.

## **Materials and Methods**

This analytical cross-sectional study was conducted in the Department of Community Medicine Gomal Medical College Dera Ismail Khan, Pakistan. The duration of this research study was from May 1, 2022, to May 30, 2022. The technical approval of this project was granted by the Research Review Committee of the institute. Ethical approval is required as it involves interaction with humans. This project is part of the studies for 4th-year MBBS and was supervised by Dr. Samina Qadir HOD community medicine.

## **Population, Sample Size, and Sampling Technique**

Khyber Pakhtunkhwa often abbreviated as KPK is the third-largest province in terms of population and economy; It is located in the northwest region of the country, along the Afghanistan-Pakistan border and close to the Tajikistan border. The population of Khyber Pakhtunkhwa was 35.5 million at the time of the 2017 Census of Pakistan. There are a total of 30 medical and dental colleges in KPK, which are recognized by the Pakistan Medical Commission. Among 30 KPK medical colleges, 14 are public sector and 16 are private section medical and dental colleges. Our Population size included all medical students studying in public as well as private medical colleges of KPK (comprising 8200 medical students). According to Rao's soft SPSS sample size calculator, for a population of 8500 with a confidence interval of 95%, margin of error of 5%, and response rate of 50%, our sample size was at least 363. However, we tried our sample size of 500 students to be collected as a result of the non-probability consecutive sampling technique.

## **Inclusion criteria**

Inclusion criteria for sample collection were students of medical colleges of KPK between the age group ranging from 18 to 26 years for both males and females. Also, a medical student using the internet for the last six months, willingly available to fill out the questionnaire with proper responsibility was included in the research study.

**Exclusion criteria**

Medical students not willing, or not available were excluded from the sample.

**Research variable**

Our research variable was Internet addiction and the users were categorized according to results as normal users, problematic users, or addicts, based on criteria given by Young's IAT. Scores up to and including 49 were labeled as average online users. Participants with scores of 50-79 were categorized as moderately problematic internet users. Participants with scores of 80 and above were those with severe problematic internet use and they were labeled as internet addicts.

**Demographic variable**

**Gender** with two attributes male and female

**Student type** with two attributes public or private medical sector.

**Data collection procedure**

**Data collection tool:** To check for the prevalence of Internet addiction, we used the renowned Dr. Kimberly Young's Internet Addiction Test which comprises 20 questions, the answers to these questions were evaluated using the Five Point Likert scale.

**Conduct of procedure:** A questionnaire consisting of Young's IAT questions and the questions related to our demographic variables was provided as a soft copy and was sent to our concerned medical students willing to participate in the research study. The data was collected as a backup by using Google Forms and was compiled at the end of the study.

**Descriptive Analysis:** The prevalence and distribution among the variables in the sample were described as frequency and percentages.

**Inferential Analysis:** To assess the significant association between research variables (internet addiction) with demographic variables (gender, type of students i.e public and private medical students) we used a Chi-square test of association with 95% CI to estimate population parameters.

**Result**

The study was carried out on 365 students out of which 205(56.2%) were male and 160(43.8%) were female. Of the participants, 226(61.9%) belong to public sector medical colleges and 139(38.1%) belong to private medical colleges. According to the YIAT form filled out by all the participants, 172 (47.1%) participants were not addicted to the internet, while 173(47.4%) participants had moderate addiction to the internet, and 20(8.5%) were internet addicted. Out of 205 male participants, 11(5.37%) were internet addicts, while among 160 female participants, 9(5.63%) were internet addicts. This shows no significant association of gender with internet addiction i.e.,  $p = 0.589$ . Similarly, no significant association of internet addiction with the type of students was found. Out of 226 public sector medical colleges, 14(6.19%) were internet addicts. While out of 139 private medical students, 6(4.32%) were found to be internet addicts

showing no significant association of type of students with internet addiction i.e.  $p=0.654$

### c.1) Gender \* Internet addiction score cross-tabulation

Gender	Internet addiction score			
	Normal User	Problematic User	Internet addict	Total
Male	92	102	11	205
Female	80	71	9	160
Total	172	173	20	365

### c.2) Chi-Square Test

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.060 <sup>a</sup>	2	0.589
Likelihood Ratio	1.061	2	0.588
Valid Cases	365		

### c.3) Type of medical student \* Internet addiction score cross-tabulation

Type of medical student	Internet addiction score			
	Normal User	Problematic User	Internet addict	Total
Public sector medical student	108	104	14	226
Private-sector medical student	64	69	6	139
Total	172	173	20	365

### c.4) Chi-Square Test

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	0.848 <sup>a</sup>	2	0.654
Likelihood Ratio	0.865	2	0.649
Valid Cases	365		

## Discussion

Due to the excessive use of digital devices internet addiction is an emerging issue that needs to be studied. Nowadays everybody is spending more time on the Internet than any other activity. All the social applications significantly increased the rate of internet usage and the prevalence of addiction. The higher prevalence of internet addiction may have serious implications on the mental, academic, and physical well-being of a medical student. Internet addiction and its deadly consequences should be addressed on public grounds focusing on the reduction of its negative psychosocial consequences and maladaptive use. If the internet is used positively, it has the potential to be a useful and informative tool both academically and socioeconomically assisting medical students to achieve their goals. For this purpose, we have conducted a study to find the frequency of this



problem. In our study, 5.8% of respondents were severe internet addicts and 47.4% of respondents were problematic users according to YIAT (Young's Internet Addiction Test). In the study done by Dr Samina Qadir on GMC students, 2% were addicts and 45% were problematic users.<sup>2</sup>

In the study done by Krishnamoorthy 57.3 were normal users, 42.7% were problematic users and 0.3% were internet addicts. Males were suffering more from internet addiction in a study done by Choi et al and Hann and Jerusalem.<sup>11</sup> In the study done by Deepak Goel, 24.8% were problematic users and 0.7% were internet addicts.<sup>12</sup> In our study, no significant association of internet addiction with gender and type of student was found. Both public and private sector medical students had almost equal percentages of internet addicts. The percentage of problematic users in our study was higher (47.4%) as compared to the study conducted by Zaeema Ahmer in medical students of Karachi where 74.5% were moderate users and 0.7% were addicts. This may be because medical students of KPK have fewer options for outings as compared to students in Karachi so medical students of KPK use digital devices more for entertainment.<sup>13</sup> The primary data obtained in our research has provided significant results for the analysis of internet addiction among medical students of KPK Pakistan based on statistical measures such as the chi-square test of association. However, this work is limited to a minimum sample size as per Rao soft SPSS sample size calculator to evaluate the frequency and distribution of internet addiction among medical students. We believe that a broader analysis of this work can be analyzed using a larger sample size. This can give more insightful information about Internet addiction usage, effectiveness, and addiction. This can also be helpful to open novel research directions and lead researchers to address the hazardous consequences of internet addiction and its prevention in an effective manner. It could be possible medical students of KPK are having more internet addiction as compared to other provinces so the administration of KPK should take some steps to promote more physical activities and consider this issue on a serious note.

## **Conclusion**

Substance abuse is a pattern of compulsive substance use. The science of psychology defines addiction as a state of dependence either physical or psychological (or both) on the use of different substances which may be drugs or alcohol etc. Internet addiction is a new rising substance of addiction among the current and coming generation who spend most of their valuable time on screens and this is quite alarming. Our study aimed to gain insight look on prevalence of internet addiction and its distribution among the type of medical student (public or private) and gender (male and female). According to the data we received and its statistical analysis after applying chi-square test of association, we can conclude that internet addiction is not associated with the type of medical student (public or private) and interestingly its prevalence of distribution among gender (male or female) is more or less the same. Moreover, as our research was conducted on the provincial level, we came to know that medical students of our province KPK are somehow more affected by this type of addiction. In the end, we close the conclusion of our thesis by requesting the administration/faculty of respective medical colleges, and the Provincial Government to consider this issue and save the future of the nation.

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