

**Original Article**

**INTERNET ADDICTION AND ITS ASSOCIATION WITH ANXIETY IN MEDICAL UNDERGRADUATES—A CROSS-SECTIONAL STUDY**

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**ABSTRACT**

**Objective:** To study the prevalence of Internet Addiction among Medical undergraduates and Interns and exploration of its association with anxiety disorders.

**Methods:** It is a cross-sectional survey conducted among 540 undergraduate medical students and 93 Interns at Government Medical College, Ananthapuramu. Young's Internet Addiction Test and Zung's self-rated Anxiety scale were applied to measure Internet addiction and Anxiety, respectively.

**Results:** From the results, it was 36.3% of subjects had Internet Addiction, of which 2% had severe Internet Addiction. Anxiety prevalence was about 19.14 %, of which 16.8% had mild to moderate anxiety symptoms and 2.34% had severe anxiety. There was a significant association between Internet Addiction and Anxiety ( $p < 0.0001$ ). There is a negative correlation between the year of study and Internet Addiction ( $p < 0.018$ ).

**Conclusion:** Internet addiction was found among medical students and there was a significant association between Internet addiction and Anxiety among participants.

**Keywords:** Internet, Medical students, Addiction, Anxiety, Prevalence

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**INTRODUCTION**

Internet use has become a very important and necessary part of everyday life. In recent years, internet users worldwide have increased many folds. In India, according to a report published by the Internet and Mobile Association of India (IAMAI), Internet users rose to 4% (323 million) in 2020 and are estimated to have 900 million active users by 2025 [1]. Internet Addiction has been defined as Excessive or poorly controlled preoccupations, urges, or behaviours regarding computer use and internet access that leads to impairment or distress [2]. This may lead to serious mental health Issues. There are few studies from India on the prevalence of internet addiction among school children but its prevalence and relationship to mental health in vulnerable groups such as medical students remain to be explored. The information thus built will help the medical personnel to identify and go for early screening of internet addiction and its associated psychological issues. The study aims to estimate the prevalence of Internet Addiction and its association with anxiety among undergraduate medical students and Interns.

**MATERIALS AND METHODS**

This is a cross-sectional study conducted at a Government Medical College and Hospital in the Ananthapuramu district of Andhra Pradesh. The data was collected using a semi-structured socio-demographic questionnaire, an Young's Internet Addiction questionnaire [3] and Zung's Anxiety Scale [4]. Young's Internet Addiction questionnaire is used to evaluate internet Addiction among the subjects. It consists of 20 questions related to internet usage and it is scaled on a Likert scale from 1 rarely to 5 always. The maximum score is 100 points. 0-30 normal users, 31-49-mild addiction, 50-79-moderate addiction, 80-100-severe addiction. Zung's anxiety scale [4] is a self-report scale whose 20 items cover a variety of anxiety symptoms, both psychological and somatic. Responses are given on a 4-point scale which ranges from 1 (none, or a little of the time) to 4 (most, or all of the time). Participants are instructed to base their answers on their experiences over the last week. Raw scale scores for the SAS range from 20 to 80. Permission

to collect data was obtained from the Head of the Institution and the Institutional ethics committee. Questionnaires were given to the students in the form of Google forms. Consent to participate in the study was taken before filling out the forms. Out of 633 subjects, 490 members expressed their willingness to participate in the study. Only 470 gave their consent and participated in the study.

**Inclusion criteria:** It includes Undergraduate medical students to final year and interns, subjects who were willing to give consent.

**Exclusion criteria:** It includes individuals with substance use, individuals with previous psychiatric illnesses, and individuals who were not willing to give consent.

**Statistical analysis**

Data was entered in a MS X-cel sheet. Software version SPSS 23.0 was used for statistical analysis. Descriptive statistics in the form of proportions, means, and standard deviations have been applied. A Chi-square test was applied for testing the association of Internet Addiction with socio-demographic variables and anxiety status. Independent predictors were determined using Linear regression. Suspected cases of mild Internet Addiction and anxiety were counselled by a trained counsellor and moderate to severe cases were referred to the psychiatry department for further evaluation and management.

**RESULTS**

A total of 490 subjects were approached of which 470 participated in the study with a response rate of 95.9% of which males 217(46%) and females 253 (54%) (table 1). The mean age of the subjects was 20.90 y. The overall prevalence of Internet Addiction is 36.3%. The prevalence among 1st-year subjects was 24.8%, 2nd-year subjects were 18%, 3<sup>rd</sup> y subjects were 16%, 4<sup>th</sup> y subjects were 15% and interns were 26.2% (table 1). The prevalence of Internet addiction among males was 46.17% and among females was 53.8%. The study's overall prevalence of anxiety was 19.14%. The prevalence of anxiety was 28.2% in first-year students, 17.7% in second-year

students, 13.3% in third-year students, 11.5% in fourth-year students, and 22.3% in interns (table 2) (fig. 1, fig. 3). Males were more likely than females to experience anxiety (42% versus 37%).

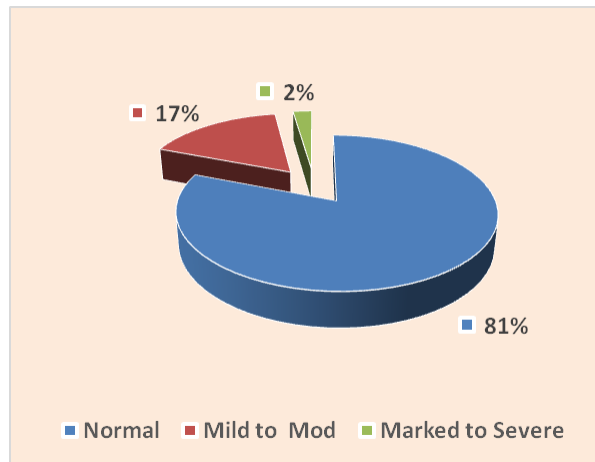
The prevalence of Anxiety in subjects with Internet Addiction was significant statistically ( $p < 0.0001$ ), with 31% of subjects with Internet addiction having Anxiety (table 3 and table 4).

**Table 1: Socio-demographic characteristics and internet addiction**

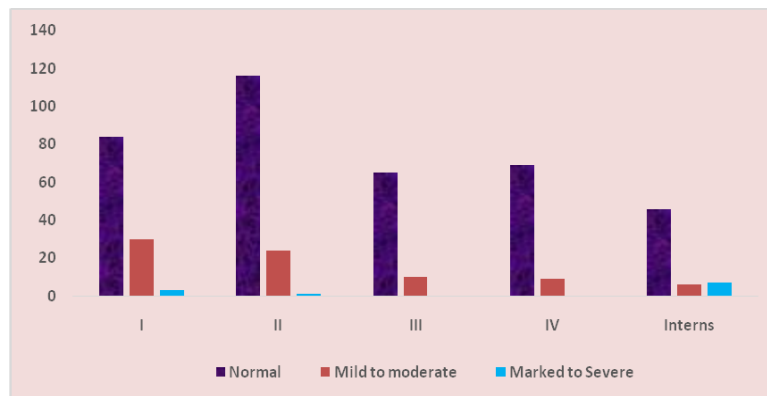
Gender	Number	Percentage
Male	217	46.17%
Female	253	53.8%
Study years		
First years	117	24.8%
Second years	85	18%
Third year	75	16%
Final year	71	15%
Interns	122	26.2%
Internet addiction		
Normal range	299	63.61%
Mild	102	21.7%
Moderate	60	12.7%
Severe	9	1.91%

**Table 2: Internet addiction**

Gender		Normal	Mild	Moderate	Severe	Total	p-value
Male	n	139	46	27	5	217	0.93
	%	64.05%	21.19%	12.44%	2.30%	100%	
Female	n	160	56	33	4	253	100%
	%	63.24%	22.13%	13.4%	1.58%	100%	
Total	N	299	102	60	9	470	100%
	%	63.61%	21.7%	12.7%	1.91%	100%	



**Fig. 1: Prevalence of anxiety**



**Fig. 2: Anxiety among different groups**

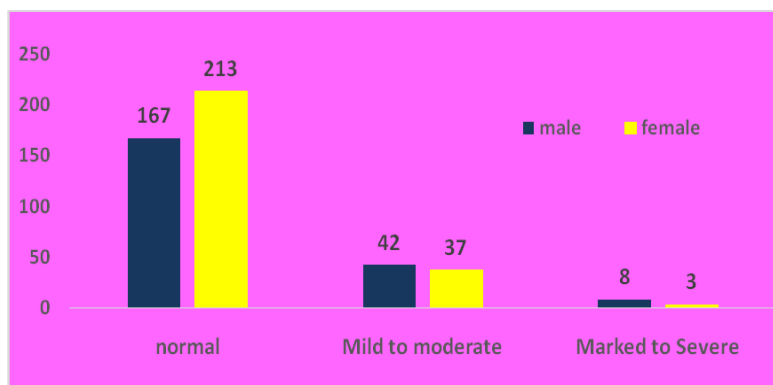


Fig. 3: Anxiety gender wise

Table 3: Linear regression with anxiety

Anxiety	B	SE	OR	Significance
Internet addiction	27.64	6.68	0.46	<0.0001*
Year of Study	-1.07	0.45	-0.14	0.018*
Age	0.247	0.339	0.04	0.46
Gender	-0.188	0.857	-0.009	0.82

Table 4: Chi <sup>2</sup>test analysis of internet addiction with anxiety

Internet addiction	Anxiety		
	No anxiety (380)	Mild to moderate (79)	Marked to severe (11)
No Internet Addiction (299)	263	34	2
Mild (102)	75	25	2
Moderate (60)	40	18	2
Severe (9)	2	2	5

Chi-Square Value: 135.8; df: 6; p<0.00001 Highly Significant

## DISCUSSION

The internet has become a significant and important service that has been utilized in several sectors of life. One of these aspects is the acquisition of knowledge for studying. Medical students who require the internet for their medical education. Researchers found a correlation between increased Internet usage and an increase in psychiatric disorders [5]. To our knowledge, very few studies have evaluated the prevalence of internet addiction among medical students. The purpose of this study was to determine the prevalence of Internet Addiction among medical students, to evaluate the relationships between Internet Addiction and participant characteristics (primarily gender and academic year), and to investigate the possible associations between Internet Addiction and anxiety. Regarding Socio-demographic data and Internet Addiction, our study revealed that no association was found between Internet Addiction and the Age and Gender of study participants. Similar findings have been reported from other studies [6-9]. An Iranian study done by Ba tool Gholamian *et al.* [10] showed a higher prevalence among females, and Carli *et al.* [11] found a higher prevalence among males, which was not in accordance to our study findings. The reason for the equal prevalence of Internet Addiction in male and female subjects may be attributed to the inexpensive availability of technology, the Internet's accessibility, and individual variances in gender and age. Around 36.3% of the study participants were found to have an internet addiction, which shows a high prevalence rate. Similar prevalence rates were found in a study conducted by Arslaan Javeed *et al.* [12] was 52.4%. Whereas the study by Muhammad Alamgir Khan *et al.* [13] and Miano Xin *et al.* [14] found 16.7% and 26.5% were addicted to the internet, respectively. The reason for this variation may be attributed to many factors like regional differences and mobile devices like smartphones and tablets have become cheaper and easier to get. This has made them more popular. Additionally, consequences of the recent pandemic leading to more online classes, social isolation, and uncertainty may be linked to the high prevalence. According to this

study's findings, there is a considerable correlation between internet addiction and anxiety. This indicates that Internet-addicted individuals exhibited considerable anxiety. Shawi *et al.* [15], Bernardi *et al.* [16], and Farah Younes *et al.* [17] reached the same conclusion about this topic based in their research. As the student progresses from the first to the final year of college, the prevalence of Internet addiction decreased a similar finding noted in other study Gamal *et al.* [18]. Other research revealed that higher grades correlate with a higher prevalence, which contradicted the present study [19]. This link may be a result of stress, the new CBME curriculum, being away from home, and a change in the environment during the first half of the programme, but the lower prevalence in the last years may be a result of cognitive maturation. After completing their senior year, they become interns, a stress-free position that affords them more opportunities to use technology.

## CONCLUSION

Internet addiction is common among medical students and is associated with anxiety.

- Gender had no bearing.
- Any efforts to combat Internet Addiction should address psychological issues as well.
- Adolescents should be encouraged to engage in physical activity, communication, and socialization daily.

## LIMITATIONS OF THE STUDY

The current study is an Online form-based study. The different categories of Internet Addiction were not explored in detail. Results cannot be generalized to the general population.

## FUNDING

Nil

**AUTHORS CONTRIBUTIONS**

Author Mandla Mounika contributed conceptual design, performed the work, and wrote the first draft of the manuscript. Authors Garugu Balaji and Shashanka Vunnam collected the literature and collected data. Vaidyanath Gottumukkula guided the work and corrected the manuscript.

**CONFLICTS OF INTERESTS**

The authors declared no conflicts of interest.

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