

IMPACT OF INTERNET ADDICTION ON EXCESSIVE DAYTIME SLEEPINESS AMONG THE OCCUPATIONAL THERAPY STUDENTS IN KANCHEEPURAM DISTRICT, TAMIL NADU

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Abstract

Background: Internet addiction is now recognized as a global public health challenge, mainly Asian population present more extreme internet use than Europeans, Americans or Africans. The likelihood of the relation between internet addiction and daytime sleepiness is on the rise. Thus, our study aimed to determine the impact of internet addiction on excessive daytime sleepiness. Methodology: A cross-sectional study was carried out from March 2022 to August 2022 using a structured and validated questionnaire among 223 students studying Occupational therapy at a tertiary care hospital in Kanchipuram district. The data was analyzed by SPSS software version 22. Chi-square test was used to test the significance of the association and a p-value <0.05 was considered significant. Results: Out of 223 participants, 43.5% were males and 56.5% were females. 51% of them showed normal internet usage, while 37%, 11% and 1% has mild, moderate and severe addiction. Among the participants with mild internet addiction, 6% of them had excessive daytime sleepiness (EDS) that requires medical attention and 74.8% had EDS that should be considered for medical attention compared to 9.6% of them who had average daytime sleepiness and 9.6% had normal daytime sleep. Conclusion: This study establishes a positive link between internet addiction and excessive daytime sleepiness. As the number of internet addicts continues to grow, doctors should actively investigate Internet addiction in adolescent cases of EDS.

Keywords: Addiction, Internet, Excessive day time sleepiness.

INTRODUCTION

The most important technological advancement of our age is the internet. Global estimates indicate that approximately 14.2% of the general population experiences internet addiction, with young adults exhibiting even higher rates, reaching up to 68%.^[1] With the pandemic that the world has recently gone through, the prevalence of internet use and internet-based addictive behaviors has risen from 4% to 43%.^[2] With more than 500 million users, India ranks second in the world with respect to people using internet and smartphone devices.^[3] Kendall et al^[4] (1998) defined internet addiction as “a psychological dependence on the internet, regardless of the type of activity once logged on”. Griffith et al^[4] (1998) conceived internet addiction as a subtype of broader technology addiction and also a subtype of behavioral addiction. Adolescents spend more time on the Internet for studying, playing online games, shopping, watching movies, interacting with social media, and chatting which can evolve into an obsession that needs to be analyzed and explained in psychiatric or psychological terms.^[5]

Problematic internet use can result in a range of psychosocial disorders, including inadequate self-esteem, increased irritability, anxiety, depression, and decreased mental immunity and academic issues.^[6] The multitude of studies conducted to date

studied the prevalence, risk factors, and consequences of internet addiction. However, the grey zone still persists as it has not been given a place in the existing classificatory systems such as DSM-5. The only behavioral addiction considered in the DSM-5 is the internet gaming disorder under conditions requiring further study.^[7] One of the most significant problems regarding compulsive internet use is disturbed sleep-wake balance, which presents as sleep problems and sleep deprivation.^[4]

Daytime sleepiness is the state of feeling tired during the day due to insufficient sleep at night and being inclined to sleep. Daytime sleepiness, which interferes with the personal and professional functioning of the individual, is termed as excessive daytime sleepiness (EDS).^[8] It is a common symptom affecting around 20% of adults and is mainly caused by sleep deprivation, use of psychoactive substances and medicines and other conditions affecting mental and physical health.^[3] Adolescent sleep is crucial not only for the regulation of emotions, attention, and psychophysiological development but also for learning and memory but the widespread use of portable electronic devices, particularly among those with internet addiction, contributes to delayed sleep patterns.^[4] Exposure to the bright light emitted by these devices causes sleep onset delays, resulting in increased daytime sleepiness, procrastination and time management issues.^[9]

Excessive daytime sleepiness has been associated with the risk of drowsy driving, injuries in the workplace, laziness, and concentration deficits, hence it has become a major international health concern.^[10] Therefore, preserving a well-regulated circadian rhythm is important as it is known to lower the risk of sleep disorders, psychological problems, and chronic health issues.^[4] Worldwide, various studies^[11] have assessed the addictive internet use and its health hazards but there is a paucity of evidence in the current geographic region. Thus, our study aimed to determine the impact of internet addiction on excessive daytime sleepiness among occupational therapy students in Kancheepuram district, Tamil Nadu.

MATERIAL AND METHODS

A Cross-sectional study was conducted in Kancheepuram district, Tamilnadu for 3 months (from February to April 2022) among Occupational therapy students in an Allied Health Science College. All the students of both genders, who were willing to participate in the study were included.

Students experiencing previously detected psychiatric illness or other systemic ailment and those who were not willing to participate were excluded from the study. 223 participants were recruited by universal sampling method, where the participation rate of the students was 89%. This was a self-administered questionnaire-based survey conducted through a pre-designed online questionnaire.

The data was collected using “socio-demographic data form” (which consists of age, sex, place of stay, type of family, parent’s occupation, parent’s marital status, socio-economic status, etc..) along with standardized diagnostic tools- Internet Addiction Test questionnaire and Epworth Sleepiness Scale. The respondents could fill the survey only once through their respective devices that way maintaining the authenticity of the sample.

The Internet Addiction Test (IAT) developed by Majchrzak et al is the Polish adaptation of the Internet Addiction Test by K.Young which consists of 20 questions verifying the influence of internet on different aspects of an individual’s life. The IAT total score is

the sum of the ratings given by the examinee for the 20-item responses. Each item is rated on a 5-point Likert scale ranging from 0 to 5.

The maximum score is 100 points. The higher the score, is higher the severity of your problem. The total score that ranges from 0 to 30 points – is considered to reflect a normal level of internet usage, scores of 31 to 49 – indicate the presence of a mild level of internet addiction, and scores of 50 to 79 – indicate the presence of a moderate level of internet addiction and scores of 80 to 100 – indicate a severe dependence on internet.^[12]

“Epworth Sleepiness Scale” (ESS)^[13] was utilized to analyze Excessive Daytime Sleepiness. It is a universal survey presented by Dr. Murray Johns of Epworth Hospital in the year 1991, Melbourne. ESS is a questionnaire comprising of 8 queries that establish the probability of falling asleep during each of the 8 described situations based on one’s experience, including everyday activities. Each of the activities listed has an assigned score from 0 to 3 that indicates how likely a person is to fall asleep during the activity.

The score of 0 = would never doze, 1 = slight chance of dozing, 2= moderate chance of dozing and 3 = high chance of dozing. The total score ranges from 0 to 24. A higher score is associated with increased sleepiness. A score of 0 to 10 indicates normal range of sleepiness in healthy adults, 11 to 14 indicates mild sleepiness, 15 to 17 indicates moderate sleepiness and 18 to 24 indicates severe sleepiness.

Data was entered and analyzed with SPSS version 22. Frequencies and percentages were calculated, chi-square test was used to find the association and a p-value < 0.05 was considered significant. The students were guaranteed data privacy and written informed consent was obtained after explaining the purpose and possible benefits of the research.

The study was conducted in accordance with the Declaration of Helsinki and the approval was obtained from the Institutional Ethics Committee of Saveetha Medical College, Chennai.

RESULTS

A total of 223 students participated in the study, of which more than half of the study participants were females 126 (56.5%) and the remaining were males 97 (43.5%). The mean age group of the participants was 20.5 years. Most of the students 175 (78.5%) belonged to the nuclear family. Notably, 95 (42%) of student’s fathers were skilled workers, while 121 (56%) of their mothers were unemployed. Among the participants, 107 (48%) resided in the hostel and a significant proportion 157 (70.4%) of them belonged to class 1 socio-economic status.

Table 1: Gender-based baseline details of study participants (n=223)

Baseline	Gender N (%)		Total N (%)
	Males	Females	
Age (in years)			
18 – 20	52 (23.3%)	61(27.4%)	113(50.7%)
21 – 23	40(17.9%)	62(27.8%)	102(45.7%)
> 24	5(2.2%)	3(1.3%)	8(3.6%)
Type of family			
Nuclear family	71(32%)	104(46.8%)	175(78.8%)
Joint family	26(11.7%)	22(9.5%)	48(21.2%)

Father's Occupation			
Professional	49(22%)	42(18.8%)	91(40.8%)
Semi-professional	13(5.8%)	21(9.4%)	34(15.2%)
Skilled	35(15.7%)	60(26.9%)	95(42.6%)
Unemployed	0(0%)	3(1.4%)	3(1.4%)
Mother's Occupation			
Professional	40(17.9%)	29(13%)	69(30.9%)
Semi-professional	3(1.3%)	10(4.5%)	13(5.8%)
Skilled	4(1.8%)	11(4.9%)	15(6.7%)
Unemployed	50(22.4%)	76(34.2%)	126(56.6%)
Parents marital status			
Married	91(40.8%)	115(51.6%)	206(92.4%)
Divorced	2(0.9%)	2(0.9%)	4(1.8%)
Separated	0(0%)	2(0.9%)	2(0.9%)
Widowed	3(1.3%)	7(3.1%)	10(4.5%)
Foster parents	1(0.4%)	0(0%)	1(0.4%)
Place of stay			
Hostel	54(24.2%)	53(23.8%)	107(48%)
Day scholar	27(12.1%)	61(27.4%)	88(39.5%)
Staying alone for rent	9(4%)	6(2.7%)	15(6.7%)
Staying with friends for rent	6(2.7%)	6(2.7%)	12(5.4%)
Others	1(0.4%)	0(0%)	1(0.4%)
Socio economic status			
Class 1	76(34.1%)	81(36.3%)	157(70.4%)
Class 2	13(5.8%)	30(13.5%)	43(19.3%)
Class 3	7(3.1%)	7(3.1%)	14(6.3%)
Class 4	1(0.4%)	6(2.7%)	7(3.1%)
Class 5	0(0%)	2(0.9%)	2(0.9%)

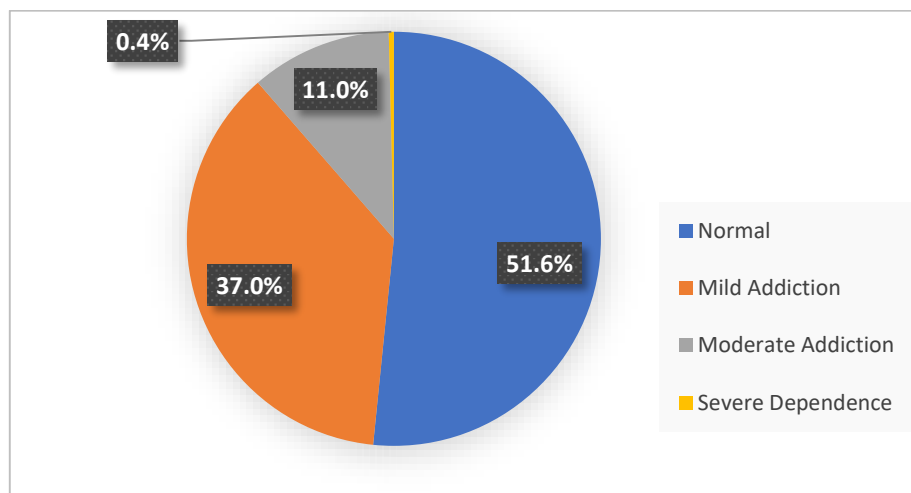


Fig 1: Internet Addiction Test

Figure 1 shows the result of internet addiction test score of the participants, where 51.1% of them showed normal internet usage, while 37% had mild addiction, 11% had moderate and 1% had severe internet addiction.

Table 2: Association between baseline details and Internet addiction level among the study participants (n=223)

Baseline	Normal	Mild	Moderate	Severe	P value
Age (in years)					
18 – 20	53 (46.9%)	47(41.6%)	12(10.6%)	1(0.9%)	0.358
21 – 23	59(57.8%)	32(31.4%)	11(10.8%)	0(0%)	

> 24	2(25%)	4(50%)	2(25%)	0(0%)	
Gender					
Male	36(37.1%)	48(49.5%)	13(13.4%)	0(0%)	0.002
Female	78(61.9%)	35(27.8%)	12(9.5%)	1(0.8%)	
Type of family					
Nuclear family	89(50.9%)	65(37.1%)	20(11.4%)	1(0.6%)	0.960
Joint family	24(51.1%)	18(38.3%)	5(10.6%)	0(0%)	
Father occupation					
Professional	32(35.2%)	50(54.9%)	8(8.8%)	1(1.1%)	0.001
Semi-professional	26(76.5%)	5(14.7%)	3(8.8%)	0(0%)	
Skilled	53(55.8%)	28(29.5%)	14(14.7%)	0(0%)	
Unemployed	3(100%)	0(0%)	0(0%)	0(0%)	
Mother occupation					
Professional	24(34.8%)	39(56.5%)	6(8.7%)	0(0%)	0.000
Semi-professional	10(76.9%)	3(23.1%)	0(0%)	0(0%)	
Skilled	7(46.6%)	6(40%)	1(6.7%)	1(6.7%)	
Unemployed	73(57.9%)	35(27.8%)	18(14.3%)	0(0%)	
Parents marital status					
Married	104(50.5%)	80(38.8%)	21(10.2%)	1(0.5%)	0.006
Divorced	0(0%)	1(25%)	3(75%)	0(0%)	
Separated	0(0%)	1(50%)	1(50%)	0(0%)	
Widowed	9(90%)	1(10%)	0(0%)	0(0%)	
Foster parents	1(100%)	0(0%)	0(0%)	0(0%)	
Place of stay					
From hostel	49(45.8%)	49(45.8%)	8(7.5%)	1(0.9%)	0.000
From house	56(63.6%)	22(25%)	10(11.4%)	0(0%)	
Staying alone for rent	2(13.3%)	6(40%)	7(46.7%)	0(0%)	
Staying with friends for rent	6(50%)	6(50%)	0(0%)	0(0%)	
Others	1(100%)	0(0%)	0(0%)	0(0%)	
Socio economic status					
Class 1	66(42%)	70(44.6%)	20(12.8%)	1(0.6%)	0.069
Class 2	30(69.8%)	10(23.2%)	3(7%)	0(0%)	
Class 3	10(71.4%)	3(21.4%)	1(7.2%)	0(0%)	
Class 4	6(85.7%)	0(0%)	1(14.3%)	0(0%)	
Class 5	2(100%)	0(0%)	0(0%)	0(0%)	

Table 2 shows the association between baseline details and internet addiction level among study participants. The proportion of females who were classified as mild, moderate and severe addicts were 27.8%, 9.5% and 0.8% respectively. For males, the corresponding proportions were 49.5%, 13.4% and 0% respectively. It was observed that internet addiction was found to be higher among males (63%) compared to females (38%). The majority of the males 48 (49.5%) had mild internet addiction. The proportion of students who stayed away from home was higher (60.5%) compared to students who stayed at home (39.5%). On looking into the marital status of the student's parents, 75% of the students with divorced parents had moderate internet addiction while, only 10.2% of students with married parents had moderate internet addiction. On using chi-square test for testing the significance of the association between baseline details and internet addiction severity, 5 variables that are, gender, fathers' occupation, mother's occupation, parents' marital status, and place of stay were found to have a statistically significant association.

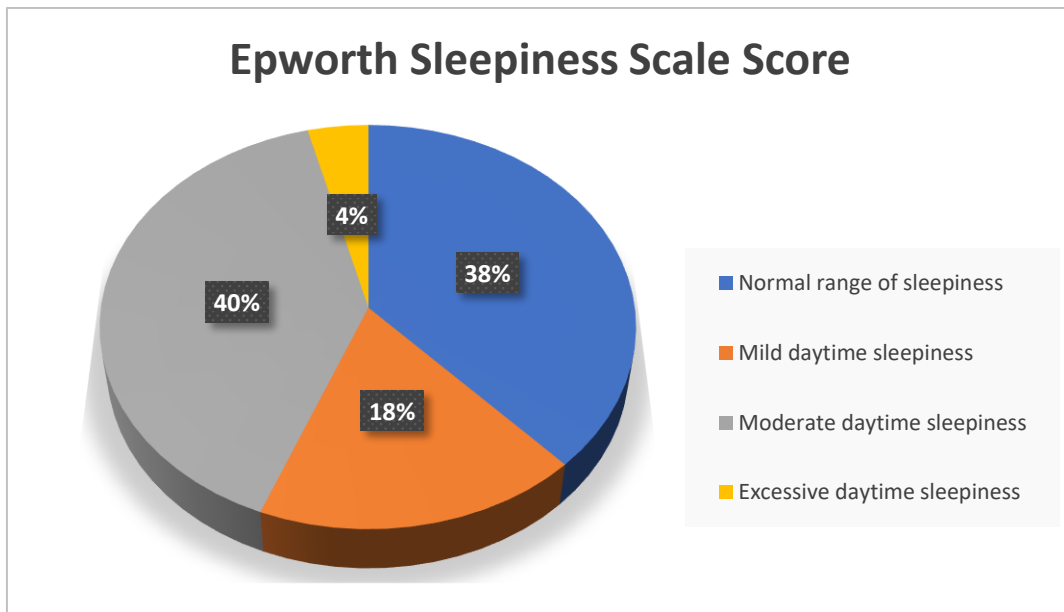


Fig 2: Epworth Sleepiness Scale Score

Figure 2 represents the results of the Epworth sleepiness scale score, where 84 (38%) had unlikely abnormal sleep, 40 (18%) of the participants had mild daytime sleepiness, while 89 (40%) of them had moderate day time sleepiness that should be considered for medical attention and 10 (4%) had excessive daytime sleepiness that requires medical attention.

Table 3: Association between IAS and EDS (n=223)

	Unlikely abnormal sleepy	Average daytime sleepiness	Daytime sleepiness- that should be considered for medical attention	Excessive daytime sleepiness- that requires medical attention	P value
IAS Score					0.000
Normal	69(60.5%)	26(22.9%)	16(14%)	3(2.6%)	
Mild addiction	8(9.6%)	8(9.6%)	62(74.8%)	5(6%)	
Moderate addiction	7(28%)	5(20%)	11(44%)	2(8%)	
Severe addiction	0(0%)	1(100%)	0(0%)	0(0%)	

Table 3 shows the association between internet addiction score and Epworth sleepiness scale score among the study participants. Among the participants who had mild internet addiction, 6% of them had EDS that requires medical attention and 74.8% had EDS that should be considered for medical attention compared to 9.6% of them who had average daytime sleepiness and the rest 9.6% had normal sleep. While amongst the participants with moderate IA, 8% of them had EDS which requires medical attention and 44% had EDS that should be considered for medical attention compared to 20% and 28% who had average daytime sleepiness and normal sleep respectively.

DISCUSSION

The Internet has revolutionized areas as diverse as education, marketing, and social communication, with the number of Internet users growing exponentially each year. Developing countries like India are no exception. Internet addiction has occupied an

important place among the leading causes of morbidity in adolescents (Kipping et al., 2012)^[14]. From this perspective, our study aimed to determine the association between internet addiction and excessive daytime sleepiness among the students of occupational therapy in a tertiary care hospital at Kancheepuram, Tamil Nadu.

Recent researches have shown that an increasing number of internet users throughout the world are experiencing internet addiction, with notable issues rising among university students. In the present study, 51.2% of the students were normal users according to IAT, whereas 37.2%, 11.2% and 0.4% had mild, moderate, and severe addiction to the internet respectively when compared to Finnish teens who suffered 24% severe addiction and 61% moderate addiction, Indian teens were not affected much with a severe form of addiction^[15]. Our data coincides with Italian data^[16]. Only 0.4% of students had a severe internet addiction and this finding was consistent with recent studies by Dehghankar et al^[17].

In terms of gender differences with regard to IA, this study found that males are more addicted to the internet than their female counterparts. This finding is comparable to that reported by Bakken et al^[18], Durkee et al^[19], Gowsami and Dutta^[20] but it is inconsistent with the findings reported by Rucker et al^[21], Gayathri A and Nesan G^[22]. Gender differences in internet addiction may be explained by differential patterns of use between males and females, with men being more likely to use the internet for games and gambling as stated by Liu & Potenza^[23] and the fact that females adapt to technology later^[20].

As a member of a nuclear family, more resources are available to an individual rather than in a joint family and access to the internet would have less competition, which might explain the higher prevalence of IA among students from nuclear families. Parent's occupation was significantly associated with internet addiction.

Considering the location, students who stayed away from home (60.5%) were more likely to become internet addicts than those who stayed at home (39.5%). This finding can be attributed to the fact that those who stayed at home had greater control by their parents over their internet use.

This study showed a majority of internet-addicted adolescents were of upper socio-economic status probably because of their ability to afford internet access. However, this finding is in contrast to studies by Leung & Lee^[24], Orsal et al^[25], Shek & Yu 2016^[26] which found that most of the internet-addicted adolescents belonged to lower socio-economic status.

Among our study participants who had mild internet addiction, 6% of them had EDS that requires medical attention and 74.8% had EDS that should be considered for medical attention compared to 9.6% of them who had average daytime sleepiness and the rest 9.6% had normal sleep. While amongst the participants with moderate IA, 8% of them had EDS which requires medical attention and 44% had EDS that should be considered for medical attention compared to 20% and 28% who had average daytime sleepiness and normal sleep respectively. This study has found that internet addiction is positively associated with EDS. Too much exposure to light at night while using internet may curtail the sleep time and cause poor sleep. Various other studies by Kapahi et al^[27] and Kubey et al^[28] indicate that there is a strong correlation between internet addiction and daytime sleepiness.

CONCLUSION

Our study confirms the findings of many previous researchers that internet addiction is significantly associated with daytime sleepiness. Thus it is high time to intercept the negative attitude of our adolescents towards internet use by periodic screening at university level and a “student guidebook for healthy internet use” may be more meaningful to revert the damaging equation. The lack of literature on Internet addiction in India compared to the Western literature indicates a lack of awareness and indicates the need for further research in this area. As the number of internet addicts continues to grow, doctors should actively investigate internet addiction in adolescent cases of EDS.

Limitations

The current research has few limitations. The ESS questionnaire has been used in most studies to assess sleep efficiency, but its multidimensional nature casts doubt in its clinical utility. The sample size is not large enough to extrapolate the results. The impact of excessive daytime sleepiness due to internet addiction was not assessed concerning academic performance. IA was assessed by a self-reported questionnaire and thus reports of internet usage are susceptible to response bias.

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Conflict Of Interest – Nil

Ethical Clearance - Obtained from Institutional Ethical Committee

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