Prevalence of Technology Addiction in School Students in Urban Areas of Chennai, Tamil Nadu

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Abstract

The internet provides us with a wide range of information and effortless communication but its' usage in excess can lead to internet addiction and is termed as problematic internet use. Internet addiction is increasing among the youth especially with the dawn of Covid-19 pandemic, due to the lockdowns imposed by the government. This study was conducted to estimate the prevalence of internet usage among students aged 15-18 years of age. This is a cross sectional study conducted among school students of age group 15 to 18 years in Urban cities. Sample size of 300 was obtained from a study where prevalence was found to be 36.7%. A pre tested semi structured questionnaire (circulated as google forms) which included demographic details of the participants and questions regarding internet addiction was collected, data was entered in Microsoft Excel and analyzed using SPSS software. Among the 300 participants 49% of the participants play online games and about 61.7% of the participants resorted to sports as their extra-curricular activity. Among the participants who play online games 61.2% of them had played with their friends. Male sex was associated to have more incidence in playing online games, staying online longer than intended and making new relationships online which was found to be statistically significant. There was a significant association among those who play online games with those who didn't have a play area nearby (p-0.035), Covid-19 pandemic (p<0.001) and among those residing in independent homes (p<0.001). This study shows us that male participants were addicted to the internet than female participants. Online gaming has increased with the new pandemic and measures should be taken to curtail their internet usage.

Keywords: Covid-19, Extracurricular Activities, Internet, Online Gaming.

Introduction

The internet provides us with a platform for a wide variety of information and easy communication. However excessive or unlimited internet use can lead to internet addiction, also termed as "problematic internet use" or "pathological internet use" which can cause distress and affect one's functions of daily routine life [1]. Today the prevalence of internet addiction among the youth could be a crisis in personal life, family relationships, social behavior and academic status [2]. Although it is quick, easy and useful for various purposes like e- commerce, cultural exposure, entertainment and rapid relay of information, the side effects of exposure to the internet are profound [3-7].

Internet addiction is a newly identified health hazard and more prevalent among adolescents and young adults with advancement of technology. Adolescents who have dysfunctional coping abilities are more prone to develop internet addiction which has a profound effect on physical and mental health, when exposed to stressful or traumatic events [3, 8-10]. It has recently been conceptualized as a type of psychopathological disorder as published by case reports [5, 11]. Online gaming, Gambling, Shopping, Email reply checking, instant to messages, pornography viewing and social media use are all behaviors, dependent on the internet and is more common among adolescent and young adults. This behavioral dependance leads to potentially weaker socialization activities and the formation of interpersonal relationships. Excessive internet usage also gives us less control of the time spent on the internet which leads to not prioritizing their personal and business rapport [5, 12-14].

Globally, there has been a surge in internet users, as it has increased from 414 million in 2000 to 665 million in 2002 and 4.574 billion The prevalence in 2019 [15-17]. Problematic internet usage in Turkey was 64.4% in 2021 with only mild variations between boys and girls [18, 19]. The prevalence of internet addiction is found be 6.3% and 3.6% among studies conducted in Japan and China respectively and is continuing to rise. The prevalence in Asian countries is relatively higher than the Western countries which thereby emphasizes on addressing the Children's problematic internet usage more seriously [14, 20-22].

COVID-19 has had a major impact on the social, economic and healthcare aspects and is causing widespread psychological problems increased symptoms anxiety, and of depression and post-traumatic stress disorder [23]. Social distancing and isolation during Covid 19 have increased internet usage among those working from home, as well as adolescents as a source of knowledge and entertainment. The pandemic lockdown promoted excessive online gaming in view of delaying spread of Covid infection and resulted in #playaparttogether campaigns [24]. Quintessentially, it is the repeated, uncontrolled and risky use of the internet which could result in disobedient and

relentless engagement of video as well as computer games [25]. In the year 2021, 53.4% of the internet users in the world belonged to the Asian population [26]. India is the second most populated country and the youth attribute to the majority of the population and are the future of the nation. The evolving concept of nuclear families and urbanization have decreased the provision of playgrounds and ends the children to resort to use other means of entertainment and communication. It has been proven that the time online has replaced the time spent in face to face communication among friends and families, physical activity, proper food and dining habits and completion of important tasks [27]. The problem of internet addiction should be curtailed at the earliest to ensure future generations to be free from the wrath of the internet and its chronic effects that prevents one to live life at its fullest.

This study was conducted to determine the prevalence of internet usage and the possible factors that contribute to the usage, among those aged between 15 and 18 years in an urban city in Tamil Nadu.

Materials and Methods

This Cross-sectional Study was conducted among school students of the age group 15 to 18 years in Urban Chennai. The study duration was for 3 months from January 2021 to March 2021.A sample size of 300 was calculated from a study done in China by Yang-Yang Li et al [1] where the prevalence of internet addiction was found to be 36.7%. [P = 36.7%, L= 15% of P]. A universal sampling technique was used to obtain the data. A pre-tested semistructured questionnaire was used to collect data from the participants using google forms. The questionnaire consists of three sections, namely, Section 1 contains socio-demographic details of school students. Section 2 consists of questions that collect data regarding internet addiction. Section 3 consists of Youngs internet addiction test which includes 20

questions which are graded using the Likert scale (0 to 5) with 0 being the lowest and 100 being the highest scores. After obtaining permission from the principal of two schools in Chennai, Google forms were sent to the students. Students belonging to 10th, 11th, 12th standard were included in the study. Informed consent was obtained from the parents before sending the Google forms. Data was tabulated in Microsoft excel and analyzed using SPSS version 26. Descriptive statistics were calculated. Association between study variables and internet addiction was found using chi square test and p value <0.05 was considered to be statistically significant.

Results

In this study, 300 school students from 15 to 18 years of age had participated in the study. Majority of the participants were male, 17 years of age and in 12th standard. Most of the participants' fathers' occupation were in the field of business and mothers were home makers (Table 1).

S.no	Variables		Frequency (N)	Percentage (%)	
1.	Sex	Male	177	59	
		Female	123	41	
2.	Age	15 Years	61	20.3	
		16 Years	81	27	
		17 Years	104	34.7	
		18 Years	54	18	
3.	Class of study	10 th	83	27.7	
		11 th	108	36	
		12 th	109	36.3	
4.	Number of members in the family	3	134	44.7	
		4	117	39	
		5	43	14.3	
		>5	6	2	

Table 1. Socio-demographic details of the Study Participants

The extracurricular activities of the
participants were grouped under art, literature,sports, online gaming and music. Most of the
participants were involved in sports (Table 2).Table 2. Extra-curricular Activities of the
Study Participants (Multiple Response)

S.No	Variable	Frequency (N)	Percentage (%)
1.	Art	67	22.3%
2.	Literature	19	6.3%
3.	Sports	185	61.7%
4.	Gaming	19	6.3%
5.	Music	27	9%
6.	Nil	10	3.3%
		327	108.9%

Out of the 300 participants, 140 had siblings and 77.1% among them (108 participants) had 1 sibling. Mobile phones were owned by 81.3% of the participants (244). Among those who did not have a mobile phone, most of them used their mother's phone.

Gadgets other than mobile phones were used by 56.7% of the participants (170). The gadgets used by the participants were XBOX, Tablets, Personal Computers and Laptops among which tablets and laptops were frequently used (Table3).

S.No	Variable	Frequency (170)	Percentage (%)
1.	XBOX	16	9.4%
2.	Tablet	66	38.8%
3.	Personal Computer	34	20%
4.	Laptop	66	38.8%
		182 responses	107%

Table 3. Gadgets used by the Study Participants (Multiple Responses)

Wireless Internet connection at home was present in 82.7% of the participants (248). A total of 147 participants (49%), play online games. Among these participants, a majority of them (90) play with their friends (i.e) 61.2% followed by others as mentioned in Table 4.

 Table 4. The Study Participants Companion for Playing Online Games (Multiple Responses)

S.No	Variable	Frequency (147)	Percentage
1.	Friends	90	61.2%
2.	Siblings	26	17.6%
3.	Strangers	7	4.8%
4.	Alone	26	17.6%
		149 responses	101.2%

About 60% of the participants (180) live in an independent house and 62% of the study participants have a play area in or around their residences. During the Covid-19 pandemic lockdown there was an increase in mobile phone usage in 68% of the participants (204). Among them 22.5% (46 participants) used it for about 4 hours per day (Figure 1).



Figure 1. Number of Hours Spent Online during COVID-19

A series of questions (Youngs internet addiction questionnaire) were asked to which they replied to as Does not apply, rarely, occasionally, frequently, often and always on the Likert scale. Table 5 shows that 76% (228) of the participants had internet addiction. About 49% of the study participants (147) had moderate internet addiction followed by the other grades as depicted below (Table 5).

Internet Addiction (Score)	Frequency (300)	Percentage (100%)
Normal (0-30)	72	24%
Mild (31-49)	42	14%
Moderate (50-79)	147	49%
Severe Dependence (80-100)	39	13%

Table5. Prevalence and Grading using Youngs Internet Addiction among the Students

Frequently, 24.7% of the participants' grades or work suffer due spending time online, 30.7% of the participants fear that life will be boring without the internet, 29% of the participants lose sleep since they are online, 27.3% of the participants try to cut down their time online but fail to do so, 24.7% of the participants try to hide that they are or have been online, 22.7% of the participants choose to online than spend that time with others and 25% of the participants feel sad or depressed when offline and feel better once online.

Often 23.7 % of the participants, snap or get annoyed if someone bothers them when they are online and 23.3% of the participants anticipate when they would get online again.

Table 6 shows us the association between demographic variables and playing online games. An association was found between the male gender and playing online games. Factors such as age and mother's occupation did not show any association with the same.

S. No	Variable		Owns a m	obile phone	Plays online games		
			Yes	no	yes	no	
1	Age	15 years	44	17	25	36	
		16 years	70	11	46	35	
		17 years	82	22	52	52	
		18 years	48	6	24	30	
			p- 0.065, 2	<i>X</i> ² - 7.24	p- 0.259,	<i>X</i> ² - 4.03	
2	Sex	Male	142	35	109	68	
		Female	102	21	38	85	
			p- 0.555, 2	<i>X</i> ² - 0.35	p-<0.001*, X ² - 27.35		
3	Mother's	Homemaker	127	30	74	83	
	occupation	Working professional	117	26	73	70	
			p- 0.837, 2	X^2 - 0.04	p- 0.498, X ² - 0.46		

Table 6. Association of Owning a Phone and Playing Online Games with Demographic Variables

*p value significant

Table 7 shows that there is an association between gender of the participants (male) and staying longer online than intended, making new relationships online and becoming defensive or secretive. Additionally making new relationships online had an association with age of the participants.

Table 7. Association of Staying Online Longer than Intended and Playing Online Games with Demographic

Variables

S.No	Variable		Age			Sex		
			15	16	17	18	Male	Female
1	Staying online	Does not apply	9	7	8	6	17	13
	longer than	Rarely	7	15	5	6	24	9

	intended	Occasionally	7	8	12	9	15	21
		Frequently	12	16	31	9	38	30
		Often	15	19	27	16	43	34
		Always	11	16	21	8	40	16
			p- 0.374	[X ² - 16.1	2]		p- 0.046	* [X ² - 11.28]
2	Making new	Does not apply	17	12	13	14	19	37
	relationships	Rarely	10	18	12	1	30	11
	online	Occasionally	9	8	16	9	23	19
		Frequently	10	18	22	5	37	18
		Often	8	18	26	15	43	24
		Always	7	7	15	10	25	14
			p- 0.015	[X ² - 28.8	8]		p< 0.001	* [X ² - 20.99]
3	Become	Does not apply	10	18	12	11	30	21
	defensive or	Rarely	11	6	11	6	14	20
	secretive when	Occasionally	10	11	17	5	24	19
	asked about	Frequently	11	22	29	17	42	37
	what they do	Often	15	17	20	8	47	13
	online	Always	4	7	15	7	20	13
			p- 0.448	p- 0.448 [X ² - 15.04]			p- 0.010 * [X ² - 15.07]	

*p value significant

In our study it was found that, playing online games was associated with environmental factors such as presence of an area to play, independent houses and the Covid -19 lockdown (Table 8).

Table 8. Association between Factors Involving Environment and Playing Online Games

S.No	Variable	Playing Online Games		
		yes	no	
1	Play area	Present	100	86
		Absent	47	67
			p- 0.035* [X ² - 4.44]	
2	During COVID-19 lockdown,	Yes	128	76
	did you notice any increase in	No	19	77
	usage of your phone?		p-<0.001* [X	² - 48.2]
3	Residence	Independent	104	43
		Apartments	76	77
			p-<0.001* [X	² - 13.87]

*p value significant

Discussion

The present study highlights a concerning prevalence of internet addiction among school students with 76% exhibiting varying degrees of dependency. This is similar to findings from other studies conducted at Kermanshah University where there was 45.5% of students who were addicted to the internet. revealing a troubling trend of excessive usage linked to mental health issues such as depression and anxiety [28]. Similarly, research involving university students in Nepal reported an internet addiction prevalence of 29.9%, suggesting that this issue spans across different educational levels and demographics [3]. Studies conducted by Uğurcan Sayılı et al showed a comparatively lower incidence of internet addiction of 18.5% among high school students [29].

The relationship between internet addiction and mental health has been established in previous studies. In our study, participants reported negative consequences such as not declines meeting academic and social withdrawal due to excessive online engagement. This result is similar to findings from a comprehensive review that demonstrated how internet addiction correlates with disrupted brain signaling in adolescents and affects attention as well as cognitive functions The implications [30]. are tremendous, as students increasingly substitute real-life interactions with online engagements, leading to experiencing heightened feelings of loneliness and depression, as suggested by research conducted at Nepal [31].

In our study, there is a significant association between the male gender and online gaming behaviors, which is consistent with trends observed in other studies such as the Kermanshah study which had also noted gender differences in internet usage patterns, further emphasizing that males are more likely to engage in problematic online activities [28]. Additionally, our findings regarding family dynamics—such as the presence of play areas and parental control of the gadgets —echo results from the Kathmandu study, where parental relationships significantly influenced internet usage patterns among students[3].

The role of environmental factors in shaping internet usage behaviors cannot be overstated. In our study, the COVID-19 lockdown was identified as a catalyst for increased mobile phone usage among 68% of participants. This observation is supported by various studies indicating that external circumstances, such as social isolation during lockdowns, have exacerbated internet addiction rates globally [28, 31]. The availability of dedicated play areas also showed a significant association with online gaming frequency in our results, reinforcing the notion that physical environments influence digital behaviours.

Given the alarming rates of internet addiction identified in this and similar studies. there is an urgent need for targeted interventions. Educational programs aimed at promoting responsible internet use and enhancing digital literacy among adolescents could mitigate the adverse effects associated with excessive online engagement. Furthermore, longitudinal studies are necessary to explore causal relationships between internet usage patterns and mental health outcomes over time.

Conclusion

In conclusion, this study contributes to the current literature on internet addiction among adolescents, highlighting its prevalence and associated risks. By contextualizing these findings within existing research, it becomes evident that addressing this issue requires a composite approach involving education, parental guidance, and community support.

Conflict of Interest

There is no conflict of interest.

Acknowledgements

I would like to express my sincere gratitude to all those who contributed to the completion of this research. I also extend my heartfelt appreciation to my colleagues and peers for their constructive discussions and assistance. I am grateful to Saveetha Medical College and Hospital (SIMATS) for providing me with the necessary resources and facilities that made this research possible. Finally, I would like to thank my family and friends for their encouragement, and unwavering support throughout this journey.

References

[1]. Li, Y., Sun, Y., Meng, S., Bao, Y., Cheng, J., Chang X et al., 2021, Internet Addiction Increases in the General Population During COVID-19: Evidence From China. *The American Journal on Addictions*, 30: 4:389-397.

[2]. Jamir, L., Duggal M., Nehra R., Singh P., Grover S., 2019, Epidemiology of technology addiction among school students in rural India. *Asian Journal of Psychiatry*, 40:30-38.

[3]. Ziapour, A., Lebni, J., Toghroli, R., Abbas, J., NeJhaddadgar, N., Salahshoor, M., et al., 2020, Jan, A study of internet addiction and its effects on mental health: A study based on Iranian University Students. *Journal of Education and Health Promotion*, 9:1:205. Available from: https://doi.org/10.4103/jehp.jehp_148_20

[4]. Cha, S. S., Seo, B. K., 2018, Smartphone use and smartphone addiction in middle school students in Korea: Prevalence, social networking service, and game use. *Health Psychol Open*, 5:1:2055102918755046. Available from: https://doi.org/10.1177/2055102918755046

[5]. Liu, Y., Wu, N., Yan, J., Yu, J., Liao, L., Wang, H., 2023, Mar 24, The relationship between health literacy and internet addiction among middle school students in Chongqing, China: A cross-sectional survey study. *PLOS ONE.18*:3. Available from : doi: 10.1371/journal.pone.0283634.

[6]. Zhang, M. W., Lim, R. B., Lee, C., Ho, R.
C., 2018, Prevalence of internet addiction in medical students: A meta-analysis. *Acad Psychiatry*, 42:88-93.

[7]. Reshadat, S., Zangeneh, A., Saeidi, S., Ghasemi, S. R., Rajabi, Gilan, N., Abbasi, S., 2015, Investigating the economic, social and cultural factors influencing total fertility rate in Kermanshah. *J Mazandaran Univ Med Sci*, 25:108-12.

[8]. Bisen, S. S., Deshpande, Y. M., 2020, Prevalence, predictors, psychological correlates of internet addiction among college students in India: A comprehensive study. *Anatol J Psychiatry*, 21:117-23. [9]. Abbas, J., Aman, J., Nurunnabi, M., Bano, S., 2019, The impact of social media on learning behavior for sustainable education: Evidence of students from selected universities in Pakistan. *Sustainabil*, 11:1683-91.

[10]. Xu, D. D., Lok, K. I., Liu, H. Z., Cao, X. L., An, F. R., Hall, B. J., et al., 2020, Oct, Internet addiction among adolescents in Macau and mainland China: prevalence, demographics and quality of life. *Scientific Reports*, 1:10:1.

[11]. Vigna-Taglianti, F., Brambilla, R., Priotto, B.,
Angelino, R., Cuomo, G., Diecidue, R., 2017,
Problematic internet use among high school students: Prevalence, associated factors and gender differences. *Psychiatry* Res, 257:163–171.
Available from:

https://doi.org/10.1016/j.psychres.2017.07.039.

[12]. Cao, H., Sun, Y., Wan, Y., Hao, J., Tao, F.,
2011, Problematic Internet use in Chinese adolescents and its relation to psychosomatic symptoms and life satisfaction. *BMC public health*, 11:802. Available from: https://doi.org/10.1186/1471-2458-11-802.

[13]. K. W. Beard, 2002, Internet addiction: current status and implications for employees. *Journal of Employment Counseling*, 1: 2–11.

[14]. Takahashi, M., Adachi, M., Nishimura, T., et al., 2018, Prevalence of pathological and maladaptive Internet use and the association with depression and health-related quality of life in Japanese elementary and junior high school-aged children. *Soc Psychiatry Psychiatr Epidemiol*, 53:1349–1359.

[15]. Rigi, Kootesh B., Raisi, M., Ziapour, A., 2016, Investigation of relationship between internet addict with mental health and quality sleep in students. *Acta Med Mediterran*, 32:1921-5.

[16]. Kaboudi, M., Dehghan, F., Ziapour, A., 2017, The effect of acceptance and commitment therapy on the mental health of women patients with type II diabetes. *Ann Trop Med Public Health*, 10:1709-13.

[17]. Special report—Digital 2023, Your ultimate guide to the evolving digital world. 2023, Date of access: 27/12/2023, Available from:

https://wearesocial.com/uk/blog/2023/01/digital-2023/

[18]. Turkish Statistical Institute, Turkstat. 2021, Date of access: 27/12/2023, Available from: https://data.tuik.gov.tr/Bulten/Index?p=Cocuklarda -Bilisim-Teknolojileri-Kullanim-Arastirmasi-2021 [19]. Guclu, Y., Guclu, O. A., Demirci, H., 2024, Mar 4, Relationships between internet addiction, smartphone addiction, sleep quality, and academic performance among high-school students. Revista da Associação Médica Brasileira, Available from: https://www.scielo.br/j/ramb/a/YhS8DWq3sNqcD RWRsC5nhHD/

[20]. Li, Y., Zhang, X., Lu, F., Zhang, Q., Wang, Y., 2014, Internet addiction among elementary and middle school students in China: a nationally representative sample study. *Cyberpsychol Behav Soc Netw*, 17:111–116.

[21]. Paulus, F. W., Ohmann, S., Von, Gontard, A., Popow, C., 2018, Internet gaming disorder in children and adolescents: a systematic review. *Dev Med Child Neurol*, 60:645–659.

[22]. Yamada, M., Sekine, M., Tatsuse, T., Asaka, Y., 2020, Prevalence and associated factors of pathological Internet use and online risky behaviors among Japanese elementary school children. *Journal of Epidemiology*.

[23]. Abel, T., McQueen, D., 2020, The COVID-19 pandemic calls for spatial distancing and social closeness: not for social distancing. *International Journal of Public Health*, 65:3:231-231.

[24]. World Health Organization encourages people to game due to coronavirus . Windows Central. 2021, Date of access:27/10/2021, Available from:

https://www.windowscentral.com/world-healthorganization-encourages-people-game-duringcoronavirus-outbreak [25]. World Internet Users Statistics and 2021
World Population Stats, Date of access: 27/10/2021, Available from: https://www.internetworldstats.com/stats.htm.

[26]. Samaha, A., Fawaz, M., El, Yahfoufi, N., Gebbawi, M., Abdallah, H., Baydoun, S., et al., 2018, Assessing the Psychometric Properties of the Internet Addiction Test (IAT) Among Lebanese College Students. *Frontiers in Public Health*, 6.

[27]. Balhara, Y., Harshwardhan, M., Kumar, R., Singh, S., 2018, Extent and pattern of problematic internet use among school students from Delhi: Findings from the cyber awareness programme. *Asian Journal of Psychiatry*, 34:38-42.

[28]. Yadav, K., Jain, A., Sharma, R., Gaur, K., Yadav, N., Sharma, P., et al., 2020, Jan, Study of internet addiction and its association with depression and insomnia in university students. *Journal of Family Medicine and Primary Care*, 1:9:3:1700. Available from: https://doi.org/10.4103/jfmpc_jfmpc_1178_19

[29]. Sayılı, U., Vehid, S., Erginöz, E., 2021, Problematic Internet use in Turkish high school students: Prevalence and related factors. *Am J Health Behav*, 1:45:1:31–43. Available from: http://dx.doi.org/10.5993/AJHB.45.1.3

[30]. How internet addiction may affect your teen's brain, according to a new study. CNN HEALTH. 2024, Date of access: 05/06/2024, Available from: https://edition.cnn.com/2024/06/04/health/internet-addiction-teen-brain-activity-wellness/index.html

[31]. Acharya, S., Adhikari, L., Khadka, S., Paudel, S., Kaphle, M., 2023, Apr, Internet Addiction and Its Associated Factors among Undergraduate Students in Kathmandu, Nepal. *Journal of Addiction* [Internet], 8:2023:1–9. Available from: https://doi.org/10.1155/2023/8782527