Original Research Article

Problematic Internet Use and Its Association with Psychological Factors, Fear Of COVID and Substance Use Among Medical Undergraduates in an Urban COVID Care Setting during the Pandemic

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ABSTRACT

Background: COVID 19 pandemic had significant impact on the mental health of individuals. The shift to online classes, assignments, prolonged quarantine, social isolation and psychological issues may be responsible for Problematic use of Internet (PUI) behaviors among medical students. The aim of the study was to assess the proportion of medical students with problematic internet usage during the COVID-19 pandemic and identify associated risk factors using a cross-sectional survey during the 3rd wave of the pandemic.
Methodology: It was a cross-sectional survey conducted among MBBS students studying in a tertiary care medical college with dedicated COVID care facility after obtaining approval from institutional ethical committee. Data was collected via Google forms after obtaining informed consent. In addition to sociodemographic data and basic details on internet usage, Young's Internet Addiction Test (IAT), WHO-ASSIST, Fear of COVID scale, Depression anxiety stress scale (DASS21) was applied. Statistical analyses were conducted using SPSSv27.
Results: 37.7% of the study population had PUI. There was a statistically significant association between depression, anxiety, stress and PUI($P<0.001$), fear of COVID with depression, anxiety and stress($r= 0.33$, 0.37, 0.33 and $p<0.001$). A stepwise linear regression analysis revealed stress and depression ($p=0.005$) to predict PUI.
Conclusions: This study determines some important associations between problematic use of internet and clinical parameters like depression, anxiety, stress and fear of COVID 19. This knowledge will help us in the screening of these conditions and aid in the overall management of these individuals.

Keywords: Problematic use of internet, COVID, Depression, stress, anxiety.

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INTRODUCTION

COVID 19 pandemic had significant impact on the mental health of individuals. Social connection enhances mental well-being and is fundamental to humans. The COVID-19 pandemic led to restrictions in social connections due to lockdown and digital platforms were the main means for people to maintain socio-emotional connection. Work, education, entertainment suddenly started getting converted from offline to online [1-2]. Though, it came as a good platform to achieve the special needs of the pandemic, excessive

screen time is also associated with a range of negative health outcomes. There is a growing concern regarding prolonged screen time due to an explosion in the use of digital technology [1].

Problematic use of Internet (PUI) may affect physical, emotional, and the mental well-being of individuals. The mental toll of prolonged quarantines, along with increased exposure to the internet, may isolate some people and lead to neglect of meaningful relationships, exacerbating PUI behaviours. Uncertainties and fears surrounding the pandemic may accentuate underlying anxieties and attenuate well-being. New PUI may arise due to multiple reasons including work-from-home together with temporal disorientation and disruption of circadian rhythms, job insecurities or losses together with motivations to fill new time voids, decreased earnings and financial problems together with motivations to reduce emotional distress and depression [3].

Few studies have demonstrated a significantly high prevalence of internet addiction among medical students during the pandemic [4]. The shift to online classes, assignments and the added effects of pandemic like social isolation and psychological issues may be responsible for this. There is limited literature on the impact of these factors on problematic use of internet among the medical students. Few studies found the male gender, increased ease of access to internet, psychological distress, and poor family functioning to be risk factors for internet addiction among medical students [5-6]. Studies in general population have shown that substance use, poor social support are also risk factors for problematic internet use [7]. Studies have also shown that internet addiction has significant impact on academic performance, sleep and mental health of medical students [4,8].

Since the pandemic may have increased the risk for internet addiction, it is necessary to study these maladaptive behaviour patterns in this group and identify risk factors for better detection and timely group specific management. Hence, we aim to assess the proportion of medical students with problematic internet usage during the COVID-19 pandemic and identify associated risk factors using a cross-sectional survey during the 3rd wave of the pandemic.

The objectives of the study were:

- To identify the proportion of medical undergraduate students with problematic internet usage.
- To assess the associated risk factors for problematic internet usage such as substance abuse, depression, anxiety, and stress.
- To identify associations between fear of the COVID-19 pandemic and problematic internet usage.

METHODOLOGY

This cross-sectional study was conducted among undergraduate medical (MBBS) students studying in a tertiary care medical college with dedicated COVID care facility after obtaining approval from institutional ethical committee. Data was collected via Google forms after obtaining informed consent with assurance of confidentiality. Convenience sampling was done, and subjects were recruited using the snowballing technique.

In addition to a semi structured proforma which contained sociodemographic data and basic details on internet usage, Young's Internet Addiction Test (IAT) [9] was used to assess severity of problematic internet usage. It contains 20 items rated according to a 5-point Likert scale and severity is graded as mild, moderate and severe based on total score. It's a reliable and valid tool which has been used in Indian college students. Scores falling in the range of moderate and severe addiction, were considered as problematic internet use.

WHO-ASSIST [10] was used to screen for the use of various substances of abuse and degree of substance related risk is graded from low to severe risk. It has been found to be valid among Indian subjects.

The Fear of COVID-19 Scale is a seven-item scale that has been validated for use in Indian population. A cutoff value of 16.5 was considered based on a recent study from Greece [11].

The depression, anxiety and stress scale (DASS 21) [12] were a 21 item screening tool for these psychological symptoms rated as mild to very severe under each domain. All these scales have good reliability and concept validity and widely used among Indian population.

Statistical Analysis

Statistical analysis of data was carried out on SPSS version 27 using Chi-square test and one-way ANOVA to analyse qualitative and quantitative variables respectively. For all statistical correlations $P < 0.05$ was considered significant. Association of the various variables with internet addiction was tested using chi-square test and independent sample t-test. Using multiple stepwise linear regression risk factors that predicted internet addiction in our population were identified.

RESULTS

Table 1: Demographic profile of study participants (N=106)

Descriptive statistics	Problematic internet usage	No problematic internet usage
Mean Age in years (SD)	21.37 (1.86)	21.75(1.66)
Sex		
Male	21(52.5)	30(45.45)
Female	19(47.5)	36(54.54)
Years of medical school N(%)		
First Year	4(10)	3 (4.5)
Second Year	6(16)	8 (12.12)
Third Year	9(22.5)	17 (25.75)
Fourth Year	11(27.5)	11(16.67)
Internship	8(20)	20 (30.30)
Post Internship	2(5)	7 (10.6)

Demographic details of the study participants have been shown in table 1. 40 among 106 medical undergraduates (37.7%) had problematic use of internet. 92 (86.8%) had low, 11 (10.4%) moderate and 3 (2.8%) had severe health risk due to tobacco usage. 90 (84.9%) had low, 12 (11.3%) moderate and 4 (3.8%) had severe health risk due to alcohol use. Our study subjects did not have health risks due to other substances. 36 (34%) was afraid of COVID as measured by fear of COVID scale. 16 (20.8%) had mild, 30 (28.3%) moderate, 8 (7.5%) severe and 30 (28.3%) had extremely severe depression. 10 (9.4%) had mild, 39 (36.8%) moderate, 7 (6.6%) severe and 29 (27.4%) had extremely severe anxiety. 16 (15.1%) had mild, 30 (28.3%) severe and 9 (8.5%) had extremely severe stress as measured by DASS 21.

Table 2: Association between problematic internet use and various clinical parameters (N=106)

Parameters	t- value	p- value
Alcohol use	-2.461	0.017*
Depression	-7.763	< 0.001*
Anxiety	-6.249	< 0.001*
Stress	-7.786	< 0.001*

* ($p < 0.05$)

Significant association between depression, anxiety, stress and problematic internet use is demonstrated in table 2 using unpaired t test.

Table 3: Association between problematic internet use and clinical parameters (N=106)

	Chi-square values	p-values
Gender	0.495	0.482
Years of internet usage	0.945	0.623
Tobacco use	9.120	0.010*
Alcohol use	12.556	0.002*

Fear of COVID	7.367	0.007*
Depression	39.322	< 0.001*
Anxiety	39.312	< 0.001*
Stress	45.599	< 0.001*

* (p< 0.05)

There is a significant association between tobacco use, alcohol use, fear of COVID, depression, anxiety and stress and PUI.

Table 4: Correlation between substance use and clinical parameters (N=106)

	Depression		**Anxiety**		**Stress**	
	r- value	**p- value**	**r- value**	**p- value**	**r- value**	**p- value**
Tobacco use	0.147	0.132	0.060	0.538	0.185	0.058
Alcohol use	0.137	0.163	0.086	0.381	0.189	0.052
Fear of COVID	0.334	< 0.001*	0.371	< 0.001*	0.336	< 0.001*

* (p< 0.05)

Significant association between fear of COVID 19 with depression, anxiety and stress has been demonstrated in table 4.

Table 5: Correlation between fear of COVID and clinical parameters (N=106)

	r- value	**p- value**
Internet Addiction	0.226	0.020*
Tobacco use	-0.175	0.073
Alcohol use	-0.292	0.002*
Depression	0.334	< 0.001*
Anxiety	0.371	< 0.001*
Stress	0.336	< 0.001*

* (p< 0.05)

Table 6: Regression analysis model to predict PUI (N=106)

Dependent variable- Problematic use of Internet

Independent Variable- Alcohol use, Tobacco use, Fear of COVID, Depression, Anxiety, Stress

Predictors (ANOVA table)	**R**	**Adjusted R-square**	**Std. Error of Estimate**	**F**	**p-value**
Stress	0.619[a]	0.377	0.385	64.436	< 0.001*
Stress, Depression	0.648[b]	0.408	0.375	6.546	0.012*

Predictors	**Parameter**	**Standardized coefficients Beta**	**t- value**	**p-value**
Stress	**Stress**	0.619	8.027	< 0.001*
Stress, Depression	**Stress**	0.359	2.838	0.005*
	Depression	0.323	2.559	0.012*

* (p< 0.05)

Stepwise linear regression analysis showed that only stress and depression predicted problematic internet use where the variables considered were alcohol use, tobacco use, fear of COVID, depression, anxiety and stress.

DISCUSSION

In the present study, males had more PUI compared to females. This is similar to the findings of a previous study done among medical students in Egypt before the pandemic [5]. Gender differences in problematic internet have also been investigated in various studies in the past where boys were found to have greater breadth of internet use. It was also found that boys may be spending more time in gaming, entertainment and girls more in chatting and blogging in social media [13]. Among boys, temperamental characteristics like novelty seeking, harm avoidance and self-transcendence, daily time spent in gaming predicted problematic use of internet. In girls, the predictors were daily time spent gaming, number of best friends, self-directedness, and cooperation [14]. In our study however, we did not investigate what domain of internet was being used by the participants. PUI was significantly associated with alcohol and tobacco use. This is like earlier studies where problematic internet use was associated with substance use. This association can be explained by shared temperamental vulnerability and vulnerable brain regions such as orbitofrontal cortex and dorsolateral prefrontal cortex for both PUI and substance use [15-17].

PUI was significantly associated with depression, anxiety and stress which is like a study done on late adolescent University students [18]. Previous studies have shown that there is an association between depression and problematic internet use [19]. This could be due to similar predisposing factors, internet being used as a coping mechanism, stress and anxiety leading to browsing regarding health, among other factors.

Fear of COVID was significantly associated with problematic internet use, depression, anxiety and stress in our study. Depression and stress were found to predict problematic internet use when step wise linear regression was used to analyse in our study. Internet use could be postulated as a coping mechanism for high fear of COVID, stress, anxiety and depression which were all found in the present study. This finding is like studies done earlier which have showed a similar association [20-21]. In a meta-analysis conducted by researchers, a strong relationship was observed between the fear of COVID-19 and anxiety ($r = .55$, $p < .001$); there were moderate relationships between the fear of COVID-19 and depression ($r = .34$, $p < .001$) and stress ($r = .44$, $p < .001$) [22]. Another metanalytic study done showed significant associations between fear of COVID-19, stress, anxiety, and depression [23].

In our study there was no significant association between substance use and depression, anxiety and stress. This is in contrary with a study done on Canadian post-secondary students where there was significant association between tobacco use and depression and also a gender specific association between anxiety and female alcohol users [24]. Another longitudinal study done on young adults has shown that association between anxiety and substance dependence is non causal and reflects the associations between childhood factors, prior substance dependence, comorbid depression, peer affiliations and the development of anxiety disorders. In the present study, childhood vulnerabilities and social factors, presence of comorbid syndromic depression were not evaluated [25].

This study has certain limitations. This being a cross sectional study, cause effect relationship cannot be determined between the clinical variables and problematic use of internet. Further, longitudinal studies are required to determine the cause effect relationships between the variables. The study being done on medical students from a single urban centre, findings cannot be generalized. We did not investigate the social factors that could play a role in the problematic internet use. Also, certain clinical conditions like ADHD and personality traits that can be common risk factors to problematic internet use, substance use, and mood disorders were not considered. However, analysis of these conditions would require a detailed clinical evaluation and our study being a survey has its limitations. Despite these limitations, this study determines some important associations between problematic use of internet and clinical parameters like depression, anxiety, stress and fear of COVID 19. This knowledge will help us in the screening of these conditions and aid in the overall management of these individuals.

REFERENCES

1. Pandya A, Lodha P. Social Connectedness, Excessive Screen Time During COVID-19 and Mental Health: A Review of Current Evidence. Front Hum Sec Social Networks; 2021.
2. De' R, Pandey N, Pal A. Impact of digital surge during Covid-19 pandemic: A viewpoint on research and practice. Int J Inf Manage 2020;55:102171.

3. Gjoneska B, Potenza MN, Jones J, Corazza O, Hall N, Sales CD, et al. Problematic use of the internet during the COVID-19 pandemic: Good practices and mental health recommendations. Compr Psychiatry 2022;112: 15227.
4. Shehata WM, Abdeldaim DE. Internet addiction among medical and non-medical students during COVID-19 pandemic, Tanta University, Egypt. Environ Sci Pollut Res Int [Internet]. 2021.
5. Ali R, Mohammed N, Aly H. Internet addiction among medical students of Sohag University, Egypt. J Egyptian Pub Health Assoc 2017;92(2):86-95.
6. Li Y, Wang Y, Jiang J, Valdimarsdóttir UA, Fall K, Fang F, et al. Psychological distress among health professional students during the COVID-19 outbreak - Corrigendum. Psychol Med. 2021;1.
7. Li Y-Y, Sun Y, Meng S-Q, Bao Y-P, Cheng J-L, Chang X-W, et al. Internet addiction increases in the general population during COVID-19: Evidence from China. Am J Addict 2021;30(4):389–97.
8. Taha MH, Shehzad K, Alamro AS, Wadi M. Internet use and addiction among medical students in Qassim University, Saudi Arabia. Sultan Qaboos Univ Med J 2019;19(2):e142–7.
9. Rosenthal SR, Cha Y, Clark MA. The internet addiction test in a young adult US population. Cyberpsychol Behav Soc Network 2018;21(10):661-6.
10. Group WA. The alcohol, smoking and substance involvement screening test (ASSIST): development, reliability and feasibility. Addiction 2002;97(9):1183-94.
11. Nikopoulou VA, Holeva V, Parlapani E, Karamouzi P, Voitsidis P, Porfyri GN, et al. Mental health screening for COVID-19: a proposed cutoff score for the Greek version of the fear of COVID-19 scale (FCV-19S). Int J Ment Health Addict 2022;20(2):907-20.
12. Henry JD, Crawford JR. The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. Br J Clin Psychol 2005;44(2):227-39.
13. Joiner R, Gavin J, Brosnan M, Cromby J, Gregory H, Guiller J, et al. Gender, internet experience, internet identification, and internet anxiety: a ten-year followup. Cyberpsychol Behav Soc Netw 2012;15:370–2.
14. Kim YJ, Roh D, Lee SK, Canan F, Potenza MN. Factors Statistically Predicting At-Risk/Problematic Internet Use in a Sample of Young Adolescent Boys and Girls in South Korea. Front. Psychiatry. Sec. Addict Disord 2018;9.
15. Rücker J, Akre C, Berchtold A, Suris JC. Problematic Internet use is associated with substance use in young adolescents. Acta Paediatr 2015;104(5):504-7.
16. Qeadan F, Egbert J, English K. Associations between problematic internet use and substance misuse among US college students. Comp Hum Behav 2022;134:107327.
17. Baroni S, Marazziti D, Mucci F, Diadema E, Dell'Osso L. Problematic Internet use in drug addicts under treatment in public rehab centers. World J Psychiatry 2019;9(3):55-64.
18. Odacı H, Çikrıkci Ö. Differences in problematic Internet use based on depression, anxiety, and stress levels. Addicta: Turkish J Addict 2017;4(1):41-61.
19. Gámez-Guadix M. Depressive symptoms and problematic internet use among adolescents: analysis of the longitudinal relationships from the cognitive-behavioural model. Cyberpsychol Behav Soc Netw 2014;17(11):714-9.
20. Lathabhavan R, Padhy PC. Role of fear of COVID-19 in the relationship of problematic internet use and stress: A retrospective cohort study among Gen X, Y and Z. Asian J Psychiatry 2022;67:102937.
21. Hashemi SG, Hosseinnezhad S, Dini S, Griffiths MD, Lin CY, Pakpour AH. The mediating effect of the cyberchondria and anxiety sensitivity in the association between problematic internet use, metacognition beliefs, and fear of COVID-19 among Iranian online population. Heliyon 2020;6(10).
22. Erbicer ES, Metin A, Cetinkaya A, Sen S. The Relationship Between Fear of COVID-19 and Depression, Anxiety, and Stress. Eur Psychologist 2022;26 (4).
23. Çıkrıkçı Ö, Çıkrıkçı N, Griffiths M. Fear of COVID-19, stress and depression: A meta-analytic test of the mediating role of anxiety. Psychol Psychother Theory, Res Pract 2022;95(4):853-74.
24. Esmaeelzadeh S, Moraros J, Thorpe L, Bird Y. The association between depression, anxiety and substance use among Canadian post-secondary students. Neuropsychiatr Dis Treat 2018;23:3241-51.
25. Goodwin RD, Fergusson DM, Horwood LJ. Association between anxiety disorders and substance use disorders among young persons: results of a 21-year longitudinal study. J Psychiatr Res 2004;38(3):295-304.

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