STUDY OF FACTORS AFFECTING INTERNET ADDICTION DURING COVID-19 PANDEMIC-IMPOSED LOCKDOWN

Dr Bhakti Murkey	Assistant Professor, Department of Psychiatry, Pacific Medical College and Hospital, Udaipur.
Dr Sureshkumar Mehta*	Professor, Department of Psychiatry, Pacific Medical College and Hospital, Udaipur. *Corresponding Author
Dr S K Sharma	Consultant Psychiatrist, Department of Psychiatry, Pacific Medical College and Hospital, Udaipur.

ABSTRACT **Introduction:** Covid-19 compelled numerous nations across the world to impose strict social isolation guidelines as preventive measures for community spread of the virus. Such isolation was implemented through nation-wide lockdowns such as the one imposed in India in March 2020. This was followed by a reported rise in people's psychological distress and resultant reliance on excessive use of the internet for coping. This study aims at exploring how individual factors in a person's life affected his/her internet use, specifically during the lockdown. **Methodology:** With informed consent, the demographic details of 200 study participants were collected and severity of their internet use both prior to and during lockdown, was assessed using the Problematic and Risky Internet Use Screening Scale (PRIUSS). Recorded data was analyzed using SPSS 26.0. **Results:** The severity of internet use and its impact on one's functioning varies as per the person's age, gender, education, health status and the main purpose of online surfing, and is seen to be significantly worse during lockdown. **Conclusion:** Severity of internet use by a person is significantly affected during lockdown by one's individual characteristics, albeit in a varied manner. Consideration of individual factors while managing internet addiction, will help in a better understanding and effective psychosocial management of this behavioral addiction.

KEYWORDS : Internet Addiction, Covid-19, Lockdown

INTRODUCTION:

The novel Corona virus first identified in Wuhan, China in December 2019 (Covid-19) has been a major public health catastrophe of our times (Dubey et al., 2020). In response to declaration of the pandemic by World Health Organization (WHO) in March 2020, numerous countries introduced preventive measures to curb community spread of the deadly virus, including the strongly promoted practice of 'spatial distancing' (Abel & McQueen, 2020). India faced a nation-wide lockdown of nearly 70 days between March and May 2020, which recorded a remarkable surge in people's emotional reactions, psychological difficulties and behavioral changes, including increased psychoactive substance use (Dubey et al., 2020). An *infodemic* of online information and accompanying increase in the frantic use of internet also surfaced in parallel. It has been documented that such social isolation and financial crises with loss of employments resulted in rise in stress levels and provided ample leisure time, which together created an opportunity for the relentless rise in behavioral addictions such as problematic internet use (PIU) (Király et al., 2020; King et al., 2020).

Internet-related behavior is often described as internet addiction or pathological internet use (PIU) or internet dependency (Chou et al., 2000). The prevalence of internet addiction varies between 1.5% and 25% in different populations across the world (Deng et al., 2007). In India, a prevalence of 0.7% is reported amongst adolescents, with more vulnerability for addiction amongst young individuals between 18 and 24 years of age (Goel et al., 2013).

Online experiences seem to act as reinforcing behaviors, as they temporarily alleviate one's anxiety, but remain potentially addictive and maladaptive coping strategies. They also initiate a vicious cycle between further reduction in social interaction and activities of daily living and more stress experienced in the process (Blasi et al., 2019; Jacobs, 1986; Khantzian, 2013; Király, 2015; Billieux, 2015). Research has found internet addiction to be associated with social exclusion, lower self-esteem, loneliness, lower life-satisfaction, stress, poor mental health, depression and anxiety (Panicker et al., 2014).

This study was designed to assess how the pattern of internet use changes amongst users in India, particularly during the lockdown period. An effort was made to identify probable factors affecting severity of internet use, such as the person's age, gender, educational status, physical health condition, mental health including use of psychoactive substances, along with the primary purpose of accessing the internet – work, recreation, academics or socializing, and the amount of time spent online in the process.

METHODOLOGY:

The study participants (n=200) were recruited by snowball sampling method, through networking by the authors and working personnel in Department of Psychiatry at Pacific Medical College, Udaipur. After taking informed consent, demographic details for each participant were recorded in a semi-structured proforma, circulated online (emails/ WhatsApp) as a Google Form. Each participant was screened for the presence of any medical or psychiatric co-morbidity including psychoactive substance use in the past 6 months, before applying the study instrument. The Problematic and Risky Internet Use Screening Scale (PRIUSS) was used to record severity of internet use in participants, both prior to and during lockdown. Statistical software of SPSS 26.0 was used for data analyses.

RESULTS:

Mean age of 200 study participants was 38.42 (+/- 12.56 SD) years, with 55% of them being females and almost half having Post graduate level of education. With a diverse occupational background, 17% of the population reported to have medical comorbidity (13% on treatment), 5% reported psychiatric comorbidity (3% on treatment) and another 5% reported other comorbid addictions (substance use). Socializing online was the most common purpose of internet use, followed by use for academic or recreational purposes and work.

The first phase of data analysis addressed specific concerns pertaining to excessive internet use by the participants by comparing overall internet use prior to and during lockdown, the results of which were published earlier. In the second phase of data analysis discussed in this study, we looked for specific effects of age, gender and educational background of study participants on their severity of internet use, both prior to and during lockdown. Similar analyses were done with reference to presence of psychiatric or medical comorbidity and comorbid substance use in participants, as well as their primary purpose of internet use (work, academic, recreation or online socializing) and the average daily time spent online in the process.

It was observed that in general, men tend to prioritize internet use (p=0.040), neglect responsibilities (p=0.008) and avoid other activities to stay online (p=0.027), and feel anxious (p=0.050) or experience withdrawal (p=0.008) when denied internet access as compared to women. These findings however, were not apparent during lockdown. Rather, it was noted that choosing to socialize online instead of in-person during lockdown was significantly higher in women as compared to men (p=0.012) (Table 1).

Table 1: Difference in pattern of internet use based on gender prior to and during lockdown

Item on PRIUSS Questionnaire	Prior to lockdown		During lockdown	
	t-value	p-value	t-value	p-value
Choose to socialize online instead of in-person	-1.857	0.065	-2.583	**0.012**
Problems with face-to-face communication	0.854	0.394	0.072	0.942
Social anxiety experienced due to internet use	0.085	0.932	-0.717	0.474
Fail to create real-life relations due to internet use	0.283	0.777	0.435	0.664
Skip out on social events to spend time online	-0.142	0.887	-0.428	0.669
Offline relationships suffer due to time spent online	2.001	0.047	1.131	0.260
Feel irritated when unable to access internet	0.697	0.486	0.420	0.675
Feel angry when unable to access internet	1.164	0.246	0.886	0.377
Feel anxious when unable to access internet	1.972	**0.050**	0.759	0.448
Feel vulnerable when unable to access internet	0.545	0.587	-1.246	0.214
Feelings of withdrawal when unable to access internet	2.695	**0.008**	0.199	0.843
Prioritize internet use over other activities	2.072	**0.040**	0.873	0.384
Avoid other activities in order to stay online	2.229	**0.027**	0.041	0.967
Neglect responsibilities due to internet use	2.659	**0.008**	0.583	0.561
Lose motivation to do other things due to internet use	0.095	0.924	-1.069	0.286
Lose sleep due to night-time internet use	-0.493	0.623	-1.561	0.120
Internet use has affected your school/ work performance	-0.118	0.906	-1.335	0.183
Do you feel you use the internet excessively?	0.123	0.903	-1.394	0.165

t=co-efficient of significance, p=significance value (2-tailed)

Age seems to affect internet use in a variable manner. Prior to lockdown, younger internet users showed significantly lesser preference for online socializing (p=0.000), and higher tendency of skipping out on social events (p=0.015), or suffering of offline relationships (p=0.001) due to their usual internet use, as well as experiencing more anger (p=0.031) or withdrawal (p=0.031) when denied internet access, as compared to older users. Irrespective of the lockdown period, youngsters also had significantly higher scores (p<0.01) on the domains of prioritizing internet use, avoiding other activities, neglecting responsibilities, lack of motivation for other things, losing night time sleep due to internet use and impaired academic performance, as well as awareness of the severity of their internet use, as compared to the older participants. In addition, specifically during the lockdown period, younger participants reported more problems with face-to-face communication (p=0.016), experiencing social anxiety to due internet use (p=0.049) and feeling irritated when denied internet access (p=0.001) (Table 2).

Table 2: Effect of age on the pattern of internet use prior to and during lockdown

Item on PRIUSS Questionnaire	Prior to lockdown		During lockdown	
	t-value	p-value	t-value	p-value
Choose to socialize online instead of in-person	0.259	**0.000**	0.044	0.532
Problems with face-to-face communication	-0.102	0.150	-0.170	**0.016**
Social anxiety experienced due to internet use	-0.121	0.087	-0.140	**0.049**
Fail to create real-life relations due to internet use	0.040	0.571	-0.069	0.334
Skip out on social events to spend time online	-0.172	**0.015**	-0.079	0.265
Offline relationships suffer due to time spent online	-0.241	**0.001**	-0.230	**0.001**
Feel irritated when unable to access internet	-0.107	0.131	-0.223	**0.001**
Feel angry when unable to access internet	-0.152	**0.031**	-0.177	**0.012**
Feel anxious when unable to access internet	0.005	0.941	0.056	0.430
Feel vulnerable when unable to access internet	-0.047	0.510	0.009	0.900
Feelings of withdrawal when unable to access internet	-0.153	**0.031**	-0.116	0.101
Prioritize internet use over other activities	-0.301	**0.000**	-0.309	**0.000**
Avoid other activities in order to stay online	-0.257	**0.000**	-0.259	**0.000**
Neglect responsibilities due to internet use	-0.270	**0.000**	-0.223	**0.002**
Lose motivation to do other things due to internet use	-0.247	**0.000**	-0.168	**0.017**
Lose sleep due to night-time internet use	-0.263	**0.000**	-0.286	**0.000**
Internet use has affected your school/ work performance	-0.247	**0.000**	-0.256	**0.000**
Do you feel you use the internet excessively?	-0.166	**0.019**	-0.210	**0.003**

t=co-efficient of significance, p=significance value (2-tailed)

Participants with a relatively higher educational status seemed to prioritize internet use more than those with lesser educational background (p=0.001), and reported higher feelings of anxiety (p=0.012), vulnerability (p=0.007) and psychological withdrawal (p=0.007) when denied internet access. These findings were consistent during the lockdown period, in addition to the expectedly higher skipping out on social events (p=0.041) and having more awareness (p=0.016) into severity of their internet use in the higher educated group.

Presence of psychiatric comorbidity seemed to have a significant positive correlation with severity of internet use in almost all domains (p<0.01) of the PRIUSS, both prior to and during lockdown. Participants who had a comorbid psychiatric illness also seemed to have more insight into their increased internet use during lockdown, as compared to their prior internet use.

Co-morbid use of psychoactive substances showed significantly higher scores on many domains of the PRIUSS prior to lockdown (p<0.05). These values were not significant in as many domains during the lockdown period. However, participants using psychoactive substances showed significantly higher sleep disturbances (p=0.033) during lockdown (as compared to prior).

Surprisingly, presence of medical comorbidity showed a higher correlation with severity of internet use, specifically with preference for online socializing (p=0.007) and skipping out on social events in order to spend time online (p=0.000) prior to lockdown. These participants also experienced significantly higher anger (p=0.017), anxiety (p=0.009), vulnerability (p=0.000) and withdrawal (p=0.38) when denied internet access, as compared to others without medical diagnoses. These findings however, were not consistent during the lockdown, wherein only the feelings of vulnerability (p=0.001) and neglect of responsibilities (p=0.049) were seen to be higher amongst this group. These participants also acknowledged that their internet use was significantly higher during the lockdown period (p=0.036).

When used for the purpose of work, the overall level of motivation to do other things (p=0.035) and feelings of irritation when denied internet access (p=0.018) were found to be significantly lesser prior to lockdown. However, during lockdown the participants working from home reported to have higher levels of preference for online socializing (p=0.002), more problems with face-to-face

communication (p=0.044) and more awareness into severity of their internet use (p=0.017).

Prior to lockdown, use of internet for academic purposes seemed to have a protective role in reducing the severity of internet use in students. These participants preferred to attend social events (p=0.035), had better offline relationships (p=0.007) and engaged in other activities (p=0.045), without neglecting responsibilities (p=0.011) as compared to those who did not use the internet for academic purposes. This difference was not observed during the lockdown, indicating an adverse impact of social isolation on the functioning of student population.

Prior to the lockdown, recreational use of internet showed a significant positive correlation with problems with face-to-face communication (p=0.038) and difficulty creating real-life relations (p=0.008) along with its adverse impact on academic/ occupational functioning (p=0.026) in the participants. These findings were not replicated in their recreational internet use during lockdown.

Internet use for the purpose of online socializing did not specifically affect the severity domains on PRIUSS prior to lockdown. However, as expected, the preference for socializing online (p=0.016) was significantly higher in the participants during lockdown. Additionally, the lockdown period also showed significantly more avoidance of other activities (p=0.036), loss of night-time sleep (p=0.003) and awareness into severity of internet use (p=0.032) in study participants. Irrespective of the lockdown, the average amount of time spent online every day by the participants (other than their work or academic obligations) correlated significantly with all the severity domains on PRIUSS (p<0.01), including the worsening of its impact on their socio-occupational and interpersonal functioning.

DISCUSSION:
Literature review reveals few studies assessing the role of various individual characteristics on the severity of one's internet use. There are considerable number of studies exploring role of gender in influencing internet use, which have documented a male preponderance in the prevalence of internet addiction. An Indian study assessing gender-specific variation in pattern of internet use also identified male gender as one of the predictors of severe internet use (Gedam et al., 2017), which replicates results of other studies (Bimber et al., 2000; Kochhar et al., 2013). While our study could find a similar association between male gender and severity of internet use, these findings could not be elicited during the lockdown period. Female predilection for online socializing found during lockdown could be explained by the obvious restriction in usual socializing outside homes. Also, extensive research has observed females to be more likely to communicate with close or anonymous friends online, with the aim of sharing their feelings/ emotions, which also supports our finding (Young et al., 1998).

The above study found similar results in prevalence of internet severity in undergraduate students and university students, suggesting no clear impact of age or educational status on internet use (Gedam et al., 2017). However, in our study the severity of internet use was significantly higher in younger participants and worse during lockdown, through interference in night time sleep and real-world interactions. Another study identified a multi-factorial role of low family monitoring, high family conflicts and high psychoactive substance use with peer pressure in adolescents in increasing internet use amongst vulnerable youngsters. The authors suggested parents, educationists and health professionals to monitor internet use in their children/ students as preventive measures (Yen et al., 2009).

Over the years, various studies have reported presence of psychiatric comorbidities or symptoms of loss of emotional/ behavioral control, psychological distress and reduced emotional ties, seen with internet addiction; with strong associations with addiction severity (Kraut et al., 1998; Cardak et al., 2013; Panicker et al., 2014). These findings have been replicated in our analysis both prior to and during lockdown. A dearth of data on variation in pattern of internet use with medical illnesses and the association of internet addiction with other addictions (psychoactive substance use) makes our findings of significant positive correlations for the same, both unique and preliminary.

The study by Gedam and colleagues reported no influence of purpose of accessing the internet on the severity of internet use (Gedam et al., 2017). This result was also reflected in another study conducted on

college students in Bengaluru, India (Krishnamurthy et al., 2015). The findings of our study are in contrast to these, and perhaps explained to be a result of probable confounding factors such as perceived stress and psychiatric comorbidity in individuals. In addition, the severity of internet use in our study participants correlated significantly with the amount of time spent online, irrespective of the purpose of internet use. This seems to be an obvious correlation, but nevertheless re-emphasizes the importance of reduction in screen time as an important strategy for managing internet addictions.

The results obtained in this study indicate an overall higher severity of internet use in relatively younger men, with higher educational status and having a comorbid medical or psychiatric illness, including psychoactive substance use. Use of internet for recreational purposes appeared to be associated with a higher severity of internet addiction. During lockdown, most of these findings were consistent, except for higher predilection for internet use among females and worse impact of internet use among participants working from home.

CONCLUSION:
The pandemic-imposed lockdown saw a surge in the overall severity of internet use amongst users in India. This appears to affect the interpersonal or socio-occupational functioning of individuals in a varied fashion, depending upon their age, gender, educational background, health status (physical and mental), comorbid substance use and the primary purpose of internet use. Consideration of these variables in assessing severity of internet use by people will help in a better understanding of the genesis and effective psychosocial management of this behavioral addiction.

LIMITATIONS:
The sample collection in this study was by the non-probability method of snowball sampling, leaving scope for both, sampling and selection bias. Internet addiction is known to largely manifest in the age group of 20s to 30s (Young et al., 1999), which is not represented in our population (mean age = 38.42 years); implying skewing of data from epidemiological statistics. Lower educational status was not adequately represented in the study population. PRIUSS, originally designed for internet use assessment in adolescent population, was applied across all age groups in our study.

FUTURE DIRECTIONS:
A larger, randomized and heterogeneous sample is required for this study, for probable extrapolation of the findings to general population.

ACKNOWLEDGEMENT:

CONFLICT OF INTEREST:
The authors have no conflicts of interest to disclose.

FUNDING:

REFERENCES:
1. Dubey S, Biswas P, Ghosh R, Chatterjee S, Dubey MJ, Chatterjee S, et al. (2020) Psychosocial impact of COVID-19. Diabetes Metab Syndrome
2. Abel T, McQueen D. (2020) The COVID-19 pandemic calls for spatial distancing and social closeness: not for social distancing! Int J Public Health.
3. Kir_aly O, Potenza MN, Stein DJ, King DL, Hodgins DC, Saunders JB, et al. (2020) Preventing problematic internet use during the COVID-19 pandemic: consensus guidance. Compr Psychiatr; 100:152180
4. King DL, Delfabbro PH, Billieux J, Potenza MN. (2020) Problematic online gaming and the COVID-19 pandemic. J Behav Addict
5. Chou C, Hsiao MC. (2000) Internet addiction, usage, gratifications, and pleasure experience—The Taiwan college students' case. Comput Educ; 35:65-80
6. Deng YX, Hu M, Hu GQ, Wang LS, Sun ZQ. (2007) An investigation on the prevalence of internet addiction disorder in middle school students of Hunan province. Zhonghua Liu Xing Bing Xue Za Zhi; 28:445-8
7. Goel D, Subramanyam A, Kamath R. (2013) A study on the prevalence of internet addiction and its association with psychopathology in Indian adolescents. Indian J Psychiatry; 55:140-3
8. BlasiMD, Giardina A, Giordano C, Coco GL, Tosto C, Billieux J, et al. (2019) Problematic video game use as an emotional coping strategy: evidence from a sample of MMORPG gamers. J Behav Addict.;8(1):25–34
9. Jacobs DF. (1986) A general theory of addictions: a new theoretical model. Journal of Gambling Behavior; 2(1):15–31
10. Khantzian EJ. (2013) Addiction as a self-regulation disorder and the role of self-medication. Addiction; 108(4):668–9
11. Király O, Urbán R, Griffiths MD, Ágoston C, Nagygyörgy K, Kökönyei G, et al. (2015) Psychiatric symptoms and problematic online gaming: themediating effect of gaming motivation. J Med Internet Res.; 17(4): e88
12. Billieux J, Schimmenti A, Khazaal Y, Maurage P, Heeren A. (2015) Are we

overpathologizing everyday life? A tenable blueprint for behavioral addiction research. J Behav Addict.; 4(3): 119–23

13. Panicker J, Sachdev R. (2014) Relations among loneliness, depression, anxiety, stress and problematic internet use. Int J Res App Natural Soc Sci.; 2:1-10

14. Gedam, S. R., Ghosh, S., Modi, L., Goyal, A., & Mansharamani, H. (2017) Study of internet addiction: Prevalence, pattern, and psychopathology among health professional undergraduates. *Indian Journal of Social Psychiatry*, *33*(4), 305

15. Bimber, B. (2000) Measuring the gender gap on the *Internet.Social Science Quarterly, 81(3),* 868-876

16. Kochhar, S., Singh, K., Pani, P., Kansal, S., Anandani, C. and Thakral, A. (2013) Knowledge and Usage of Internet among different professional students in India. *Universal Journal of Education and General Studies, 2(7),* 233-238

17. Young, K. S. (1998) Caught in the net. New York: Wiley

18. Yen, C. F., Ko, C. H., Yen, J. Y., Chang, Y. P., & Cheng, C. P. (2009) Multi─ dimensional discriminative factors for Internet addiction among adolescents regarding gender and age. *Psychiatry and clinical neurosciences*, *63*(3), 357-364

19. Kraut R, Patterson M, Landmark V, Kiesler S, Mukophadhyay T, Scherlis W. (1998) Internet paradox: A social technology that reduces social involvement and psychological well-being? Am Psychol; 53:1017-31

20. Çardak M. (2013) Psychological well-being and internet addiction among university students. Turk Online J Educ Tech; 12

21. Krishnamurthy S, Chetlapalli SK. (2015) Internet Addiction: Prevalence and Risk Factors: A Cross-Sectional Study among College Students in Bengaluru, the Silicon Valley of India. Indian J Pub Health; 59

22. Young K, Pistner M, O'Mara J, Buchanan J. (1999) Cyber disorders: the mental health concern for the new millennium. *Cyberpsychol Behav.*; 2(5):475-479