

Psychosocial predictors of problematic internet use and quality of sleep among nursing students

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ABSTRACT

Background and purpose: Internet use has increased in India and globally; every field occupies the internet, but excessive use leads to negative consequences, too. Students use the internet for various purposes, leading to dependence and problematic internet use. India has the second highest internet consumption; nursing students are no exception.

Materials and Methods: The present cross-sectional study examined internet use, sensation seeking, social support, coping, sleep quality, self-esteem, and smartphone use among nursing students in Jharkhand state, India. Convenience sampling was used to recruit 167 nursing students. Statistical analysis was done using Statistical Package for Social Sciences (SPSS) version 25.0. The statistical method was determined based on the normality test.

Results: The current study shows that problematic internet use correlated with experience-seeking, boredom, susceptibility, disinhibition, adventure or thrill-seeking, smartphone addiction, Facebook intensity, and sleep quality index. It is also evident that their sleep quality index negatively correlated with family support and coping self-efficacy. Future studies need to look into various etiological factors of internet use, as there was no consensus for excessive internet use.

Conclusion: There is a need to address problematic internet use at multiple levels, like academic institutions and family levels, to prevent dependency and promote healthy internet use.

KEYWORDS

Psychosocial; Online use; Internet addiction; Smart phone dependence

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Introduction

The Modern era is considered the era of information technology and data science. It is roughly estimated that more than 40% of the world population has access to the Internet and smartphones [1]. Apparently, this statistic seems to be very encouraging but not innocuous. Uncontrolled internet use is having a very alarming impact on people's health, and some people are showing apparent dependence on the internet [2]. Like all other forms of psychoactive substance addiction, internet addiction also has on antagonistic impact on socio-occupational and interpersonal functions of people who are using it excessively or uncontrollably. Some of them also develop syndromal mental disorders in addition to internet addiction and in those cases, situation becomes more worrisome [3-5]. Internet addiction has emerged as the latest form of behavioral addiction. Indeed, the picture of the modern world cannot be imagined without information technology, and the internet is the most sought-after and used part of the world of information technology. Internet is a useful tool and mostly used for communication and information seeking. Nonetheless, easy access to this technology has increased the risk of developing dependence among heavy users. Increased internet use invading the lives and functionality of those people who have developed recognizable dependence to it [6]. Students taking training in clinical disciplines like medicine and nursing are also seen to be developing signs of dependence to internet

and social media [6]. Students are especially at risk of developing dependence on the Internet, more than other population segments. Several factors made this segment of the population extremely vulnerable to the syndromal levels of addiction to the Internet. Those factors are Availability of time, ease of use, unlimited access to the Internet and smartphones, the specific psychological and developmental characteristics of young adulthood, lack of parental supervision, excessive internet-oriented course curriculums, finding the internet to be a source of stress buster observed that factors like 'having one's own computer', 'Internet access at home' and 'having an email account' were 2 times more risky to develop internet addiction among the students compared to their counterparts who do not have those [6-8].

Additionally, those who use the Internet for seeing the news or reading newspapers were 2.5 times more likely to develop internet addiction compared to those who do not. The use of the Internet for scientific research and education reduces the chances of internet addiction by 0.7 times among the students. Other important risk factors of developing internet addiction were identified to be 'being unmarried', 'younger age', 'having access to a smartphone', and 'being unemployed'. Incidentally those are common characteristics of university students and might be those factors increase the risk of internet addiction among them [7,9,10]. Today, social

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networks provide quickest access to information and many activities through the internet platform. Young people tend to invest a significant part of their time by sharing information on social networks and updating their social media posts. This intense urgency to continuously update and monitor behaviour has been termed the 'fear of missing out (FoMO)'. This term 'FoMO' was first identified in USA. FoMO, a new type of addiction that compels individuals to spend long periods on social networks because of the fear of missing the developments and not being aware of the developments or events, which has emerged with the increase of the use of the internet and especially smartphones. FoMO has caused an increase in the use of social networks ad. When nursing students use internet-based social networking to improve their social relationships, there are chances of having pros and cons of using social media for networking. For jobs where interpersonal communication has a major significance, great communication skills are mandate for them. Nurses bear significant responsibilities in delivering care and treatment, including fostering patient-nurse interactions and cultivating an ideal communication environment. The introduction of the Internet in healthcare has ushered in a new era of communication, surpassing traditional methods and revolutionizing the way information is exchanged in the field [11,12]. The primary objective of this study is to evaluate the extent of Internet addiction among nursing students and uncover potential predictors, including factors such as sensation seeking, self-esteem, and perceived social support.

Methodology

This cross-sectional study was carried out on Nursing Students pursuing General Nursing and Midwifery (GNM) from five Nursing Colleges located in different cities of the State of Jharkhand, India. A total of 167 nursing students were selected conveniently while they had come to the Central Institute of Psychiatry for 15 days training in Psychiatric Nursing. This study carried out at Central Institute of Psychiatry, Ranchi, which is a tertiary referral multidisciplinary mental health institute operating under the auspices of the Ministry of Health and Family Welfare, Government of India. All the psychiatric nursing students were gathered and informed about the purpose of the current study. Following this, those who volunteered were provided with an informed consent form and a semi-structured questionnaire prepared by the research team. The study included students who had access to smart phones, and other gadgets with internet. Below 18 years of the students, and male gender were excluded. However, students who were already dealing with psychological issues or any other co-morbidities were excluded from the study. After data collection, all the data were entered into the Statistical Package for Social Sciences (SPSS version 25.0). The data were then cleaned and coded for further statistical proceedings. In this study, the predictive effect of brief sensation seeking, self-esteem, family support, and smartphone addiction (predicting variables) over Generalized Problematic Internet (predicted variable) and quality of sleep (predicted variable) was investigated through regression analysis.

Measures

Socio-Demographic Data Sheet

For carrying out the socio-demographic profiling of the selected

subjects (Nursing Students), a structured socio-demographic data sheet was developed by the researchers. This data sheet contains important and relevant socio-demographic variables like 'age', 'phase of education', 'religion', 'ethnicity', 'monthly income of the family', 'marital status', 'habitat', 'type of family', 'parental educational level'.

Generalized Problematic Internet Use Scale - 2 (GPIUS - 2) [13]

The GPIUS-2 is a multidimensional psychometric tool that comprises of 15 items which can be rated on a 7-point Likert scale ranging from "Strongly disagree=1" to "Strongly agree=7". This scale is meant for assessing the degree of generalized Problematic Internet Use cognitions, behaviours, and negative outcomes experienced by individuals and the overall GPIUS-2 index score may be calculated by averaging participants' scores on all 15 items, which results in score ranging from 1 to 7 or it can be computed by summing the 15 items of the scale, in which the total score ranges from 15 to 105. In this scale, higher scores indicating greater intensities of generalized Problematic Internet Use cognitions, behaviours, and negative outcomes.

Smartphone Application-Based Addiction Scale (SABAS) [14]

SABAS is a brief screening measure which was originally developed in Hungarian language and later validated in English. It consists of 6 items measured using 6-point Likert scale that ranges from "strongly disagree=1" to "strongly agree=6". While the total score for the scale is computed by adding the individual scores for the 6 items and it ranges from minimum of 6 to a maximum of 36. In which higher scores indicates an increased risk for smartphone addiction.

Brief Sensation Seeking Scale (BSSS) [15]

The BSSS is a brief scale meant for assessing general sensation seeking, which indicates various dispositional risk factors associated with problem behaviors. It comprises eight items, two per four subscales and the responses are indicated on five-point Likert rating scales ranging from "strongly disagree=1" to "strongly agree=5". Although the scale generates single score, it comprises reflecting experience seeking, boredom susceptibility, thrill and adventure seeking, and disinhibition.

Multidimensional Scale of Perceived Social Support [16]

The Multidimensional Scale of Perceived Social Support (MSPSS) is a brief research tool comprising of 12 items with 4 items for each subscale. This assessment gauges perceived support from three key sources: Family, Friends, and a Significant Other. Respondents rate each item on a Likert scale from "1 = Very Strongly Disagree" to "7 = Very Strongly Agree", with elevated subscale and total scores reflecting heightened levels of perceived social support. It is important to note that this tool relies on self-reporting to measure social support.

Pittsburg Sleep Quality Index [17]

The Pittsburgh Sleep Quality Index (PSQI) is a self-rated questionnaire which assesses sleep quality and disturbances over a 1-month time interval. It contains 19- self-reported items which are meant for measuring 7-sub categories related to sleep quality, such as subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of

sleeping medication, and daytime dysfunction. It consists of both Likert type and open-ended questions that enables the respondents to rate their overall sleep quality and to indicate how frequently they experience certain sleep difficulties over the past month. Scores for each item range from 0 to 3, with higher scores indicating more acute sleep disturbances. While the developers have suggested a cut-off score of 5 for the global scale as it correctly identified 88.5% of the patient group in their validation study.

Rosenberg Self-Esteem Scale [18]

The Rosenberg Self-Esteem Scale is a 10-item scale, which is believed to be uni-dimensional scale widely used as a self-report instrument for evaluating individual self-esteem. All items are rated on 4-point Likert scale format ranging from strongly agree to strongly disagree. The purpose of this scale is to measure self-esteem. Scoring involves a method of combined ratings. Items 2, 5, 6, 8, and 9 are scored in reverse, and the total score is derived from summing the scores of all 10 items. Elevated scores on this scale correspond to heightened levels of self-esteem.

Table 1. Socio-demographic Variables of the nursing trainees.

Variables	Categories	Frequency	Percentage
Marital Status	Unmarried	142	85
	Married	25	15
Type of family	Nuclear	112	67.1
	Joint	55	32.9
	Urban	51	30.5
Domicile	Rural	78	45.5
	Semi-Urban	40	24.0
Mother's occupation	Housewife	146	87.4
	Employed	21	12.6
Father's occupation	Business	15	9.5
	Employed	76	45.5
	Farmer	75	44.9
Residence	Family members	69	41.3
	Relatives/Friends	16	9.6
	Hostel	82	49.1
	Hindu	104	62.3
	Islam	05	3.0
Religion	Christianity	29	17.4
	Other	29	17.4
Usage of smart phone/mobile phone while using wash room/rest room	Yes	60	35.9
	No	107	64.1
Change in eating pattern	Yes	22	13.2
	No	145	86.8
Disturbance in relationship	Yes	44	26.3
	No	123	73.7

Coping Self-Efficacy Scale (CSE) [19]

The CSE is a 26-item measure of one's confidence in performing coping behaviour when facing life challenges. It measures the use of problem-focused coping, receiving of social support and stopping unpleasant emotions and thoughts. Respondents are asked to rate on an 11-point Likert scale the extent to which they believe they could perform behaviours important to adaptive coping. Scores range from ("0-cannot do at all", "5-moderately certain can do", and "10-certain can do"). Item scores are summated to create an overall CSE score (maximum 260). Higher scores indicate higher level of coping self-efficacy.

Statistical Analysis

Statistical analysis has been done with 'Statistical Package for Social Sciences (SPSS version 25.0)'. The statistical method has been determined based on the test of normality. Frequency, percentile, and Pearson correlation coefficient was used for finding the correlations between various socio-demographic variables and scales. Step-wise multiple linear regression was used to test if smartphone addiction and coping self-efficacy significantly predicts the sleep quality index (Table 1).

Tried to control or curtail the use of the internet	Yes	52	31.1
	No	115	68.9
Experienced body pain due to long use of long of hours internet	Yes	50	29.9
	No	117	70.1
Variables		Mean	Standard deviation
Age		24.05	5.72
Family income		32311.38	26985.69
Age of being using the internet		17.43	5.73
Average internet usage (minutes)		184.86	119.50
Money spends on recharge		270.81	156.46

RESULTS

Table 1. depicts the socio-demographic profile of the selected nursing students. Most of them were from rural areas (78%), and their average age was 24 years. Most of them have been using internet facilities since the age of 17; they would spend approximately 270 Rupees/month for internet. Their average length of daily internet use is 3 hours. Most participants belong to the nuclear family (67.1%) with a family income of 32,000 Rupees/month. Currently, most of them were staying in the hostel (49%) and they were unmarried (85%). Around 26.3% of the participants reported that they had a disturbance in the relationship due to internet usage and 31.1% of participants had tried to control the use of the internet and 29.9% of participants experienced body pain due to prolonged use of the internet. Apart from that, 35.9% of the participants mentioned using a mobile phone or smartphone while using the

washroom/restroom.

There is a significant positive correlation between experience seeking ($p < .01$), boredom susceptibility ($p < .01$), disinhibition ($p < .01$), adventure or thrill seeking ($p < .01$), smartphone addiction ($p < .01$), Facebook intensity ($p < .01$), sleep quality index ($p < .01$) with problematic internet usage. It also shows that there is a significant negative correlation between age ($p < .01$), age being using the internet ($p < .01$), family support ($p < .01$), friends support ($p < .05$), other significant support ($p < .05$), coping self-efficacy and self-esteem with problematic internet usage. The table shows that there is a significant positive correlation between problematic internet usage ($p < .01$), smartphone addiction ($p < .01$). While it also shows that there was a significant negative correlation between family support ($p < .05$) and coping self-efficacy ($p < .01$) with sleep quality index in Table 2.

Table 2. Correlation between predictor variables and predicting variables.

Variables	Age		Age being using the internet		Family support		Friends support	
	r	p	r	p	r	p	r	p
Problematic Internet Usage	-.211**	0.006	-.283**	0	-.329**	0	-.169*	0.029
Variables	Disinhibition		Adventure or thrill seeking		Smartphone addiction		Coping self-efficacy	
	r	p	r	p	r	p	r	p
Problematic Internet Usage	.323**	0	.208**	0.007	.678**	0	-.301**	0
Variables	Family support		Problematic internet usage		Smartphone addiction		Coping self-efficacy	
	r	p	r	p	r	p	r	p
Sleep quality index	-.171*	0.027	.339**	0	.257**	0.001	-.300**	0

In Table 3, step-wise, multiple linear regression was used to test if experience-seeking, disinhibition, boredom susceptibility, Adventure or thrill-seeking self-esteem, perceived family support, perceived friend's support, and other significant perceived support significantly predict generalized problematic Internet Use. The overall regression model was statistically significant ($R^2 = .296$, F (df regression=5, df residual=161), [F-value=13.512], $p = .000b$ [$p < .01$]). It was found that experience seeking ($\beta = [\beta\text{-value}=1.930]$, $p = .001$ [$p\text{-value}<.01$]), disinhibition ($\beta = [\beta\text{-value}=1.249]$, $p = .034$

[$p\text{-value}<.05$]), boredom susceptibility ($\beta = [\beta\text{-value}=1.434]$, $p = .023$ [$p\text{-value}<.05$]), self-esteem ($\beta = [\beta\text{-value}=-.869]$, $p = .009$ [$p\text{-value}<.01$]), family support ($\beta = [\beta\text{-value}=-3.120]$, $p = .001$ [$p\text{-value}<.01$]) significantly predicted (29.6% variance) over the generalized problematic internet use. While the step-wise regression result applied with the socio-demographic variables also shows that the age is using the internet ($R^2 = .080$, F (df regression=1, df residual=165) = [F-value=14.393], $p = .000b$ [$p < .01$]); ($\beta = [\beta\text{-value}=-.778]$, $p = .000$ [$p\text{-value}<.01$]) significantly predicted (8%) in the generalized problematic internet use.

Table 3. Prediction of problematic internet usage over perceived social support, self-esteem, sensation seeking over.

Variables	Coefficient(β)	Std.Error	t-Statistic	Prob.
Constant	57.963	8.96	6.469	0.001
Family (social support)	-3.12	0.883	-3.533	0.001
Experience seeking	1.93	0.546	3.534	0.001
Disinhibition	1.249	0.584	2.139	0.034
Self-esteem	-0.869	0.327	-2.656	0.009
Boredom susceptibility	1.434	0.625	2.292	0.023

*sig<0.05; **sig<0.01; Dependent Variable: Generalized Problematic Internet Use

R :	.544 ^e
R-Squared :	0.296
Adjusted R Squared :	0.274
Standard Error of Estimation :	13.43539
Sum of Square Residual :	29062.055
Durbin-Watson Statistic :	1.865
R-Square Change :	0.023
F-Statistic :	13.512
Prob.(F-Statistic) :	.001**

Step-wise multiple linear regression was used to test if smartphone addiction and coping self-efficacy significantly predict the sleep quality index. The overall regression was statistically significant ($R^2 = .132$, F (df regression=2, df

residual=164) = [F-value=12.504], $p = .000b$ [$p < .01$]). It was found that smartphone addiction ($\beta = [\beta\text{-value}=.128]$, $p = .005$ [$p\text{-value}<.01$]), coping self-efficacy ($\beta = [\beta\text{-value}=-.024]$, $p = .001$ [$p\text{-value}<.01$]) predicted (13.2% variance) over the sleep quality index in Table 4.

Table 4. Prediction of sleep quality index over coping self-efficacy and smartphone addiction.

Variables	Coefficient(β)	Std.Error	t-Statistic	Prob.
Constant	7.059	1.507	4.685	0.001
Coping self-efficacy	-0.024	0.007	-3.534	0.001
Smartphone addiction	0.128	0.045	2.819	0.005

*sig<0.05; **sig<0.01; Dependent Variable: Sleep quality index

R :	.364 ^b
R-Squared :	0.132
Adjusted R Squared :	0.122
Standard Error of Estimation :	2.631

Sum of Square Residual :	1135.631
Durbin-Watson Statistic :	1.466
R-Square Change :	0.042
F-Statistic :	12.504
Prob.(F-Statistic) :	.001**

Discussion

The current study assessed problematic internet use among a population of female psychiatric nursing students, filling a research gap as a previous study revealed that being male is a significant risk factor for internet addiction [20]. However, a study carried out with participants varying in age using the internet for a longer time reported that adolescents are more sensation-seeking than other groups [21]. Past studies have also shown that by continuous use of the internet, adolescents' quickly get addicted to problematic internet use (PIU) such as Facebook, WhatsApp, and other social media and added that sensation-seeking helps to overcome the seeker's boredom in terms of games and engages in internet [22]. The current study also acknowledges that by continuous use, adolescents and early adulthood, regardless of gender, are prone to develop PIU in the later part of life. This study also reveals that problematic internet use among nursing students significantly correlates with their experience-seeking, boredom, susceptibility, disinhibition, adventure or thrill-seeking, smartphone addiction, Facebook intensity, and sleep quality index.

It is also evident that the nursing students' sleep quality index negatively correlated with family support and coping self-efficacy. Regression analysis further depicts that the participant's family support, experience seeking, disinhibition, self-esteem, and boredom susceptibility predict a 29.6% variance over the generalized problematic internet use. In due course, the sleep quality index of the participants also significantly predicted a 13.25% variance in smartphone addiction and coping self-efficacy. A study carried out by Lin et al., 2011 revealed that social support and internet addiction do not have a significant relation [23]. Our study results show that perceived social support in terms of family, friends, and significant other factors have a significant negative relation with problematic internet use. Family support significantly reduces problematic internet use, which supports the previous findings [24,25]. Those adolescents and young adults who tend to experience poor social support have difficulty establishing close physical and emotional connections that enable them to use the internet to satisfy their social needs [26]. Apart from that problematic internet use was associated with alcohol consumption, anxiety symptoms, and the preferred smartphone use to connect to the network [27].

Previous literature shows that low self-esteem was positively correlated to Internet addiction [28]. Several studies have investigated the relationship between self-esteem and addiction to the internet. It is found that people having low self-esteem are more vulnerable to Problematic internet use as compared with those with high self-esteem. It is possible that individuals with low self-esteem might find it difficult to control their Problematic internet use behaviour, as they fail in understanding the negative consequences of Problematic

internet use [29]. On the basis of the present study, it is found that as family support and an individual's self-esteem increase it helps in the possibility of reducing problematic internet use. While the other studies also proves that personality and self-esteem, neuroticism was positively related to extraversion, disinhibition and narcissism [30].

Further, 35.9% of participants in this study show a behavior of using mobile or smartphone while in the washroom or restroom. With all these, the study majorly indicated the correlation of PIU and the unhealthy sleep quality index, and strained relationship issues with family and friends of the participants.

Based on the present study findings, it is seen that experience-seeking, disinhibition, and boredom susceptibility lead to problematic internet use. Apart from that, higher degrees of leisure boredom and sensation-seeking had a positive association with a higher degree of smartphone dependency. Combining the functions a smartphone provides, such as various leisure opportunities to relieve leisure boredom, leisure boredom was the strongest predictor of smartphone dependency for young users [31].

Our study findings proved that increased smartphone addiction has a significant impact on sleep quality among nursing trainees. This indicates that the more the individual uses the smartphone over a period of time, the more they tend to experience disturbance in their sleep. The current study finding supports the earlier research findings that smartphone addiction was found to have a significant association with poor sleep quality [32]. Other studies have also proved that younger adults who tend to have longer average screen times tend to have poor sleep quality [33]. In addition to poor sleep quality, smartphone addiction is associated with poor academic achievement among college students, as per previous studies [32].

As mentioned in the previous studies, high impulsivity, poor academic performance, insecure attachment style, and depressive symptoms were identified as the major risk factors of problematic internet use. On the other hand, previous studies also have mentioned that insecure attachment styles among college students are prone to get addicted to internet usage [34]. The study also shows that internet addiction is negatively associated with refusal self-efficacy, and positively related to positive outcome expectancy [23]. This corresponds to the previous research studies on problematic internet usage, and it also extends further support to explain addictive internet use behaviour based on Bandura's social cognitive theory [35]. Past studies which support the cognitive behavioural model have proved that individuals experiencing prior psychological distress are prone to develop problematic internet usage [36-38]. Which further acts as the negative reinforcement mechanism to alleviate distress or sadness [39]. The present

study highlighted the need to address PIU, how excessive internet use hampers daily routines and academic performance, etc. Addressing PIU like reducing time on internet, activity scheduling, safe sleep hygiene patterns, and focusing on healthy internet use strategies will help students to achieve better outcomes. Even though the study has novel findings, it has certain limitations: convenience sampling restricts the generalizability, information was collected from only external trainees during the data collection period, future studies need to include family members, and qualitative assessment can give holistic, in-depth information.

Conclusions

Our study findings indicate the significant prevalence of problematic internet use in our sample. Problematic internet use was significantly associated with family support, self-esteem, disinhibition, and boredom susceptibility. From the public health perspective, early identification and prevention strategies for problematic internet usage can lead to better psychosocial well-being, especially among the younger adult population. As part of student support services, institution-level internet usage screening has to be done for the well-being of students and to plan other alternative activities. Future studies need to be carried out to assess the various causes of problematic internet usage among students from different streams to propose a holistic intervention plan.

Disclosure statement

No potential conflict of interest was reported by the authors.

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