

Problematic Internet Use in Undergraduate Health Science Students at a Remote Place of Nepal: A Cross-Sectional Study

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ABSTRACT

Background: Problematic internet use (PIU) is a growing concern among teenage and college students. Excessive internet use has detrimental effects on physical and mental health. This study aims to assess the computer usage pattern and calculate the frequency of PIU in undergraduate health science students at Karnali Academy of Health Sciences, Jumla, a remote place of Nepal.

Methods: A cross-sectional questionnaire-based study was conducted from October to November 2022. Data were collected from all the undergraduate students who consented to participate. The questionnaire included students' computer-related behaviours. PIU was defined as a score of 42 or above on the PIU questionnaire. Data were analyzed by descriptive and analytical statistics, keeping p value <0.05 as significant.

Results: Among 127 students, majority used smartphones and laptops, primarily for social media. The mean duration of internet use was 6.09±2.63 years, with an average daily use of 2.54±2.05 hours on weekdays and 3.88±2.2 hours on weekends. The prevalence of PIU among the participants was 43.3%, which was not significantly different by gender (p=0.094). The PIU score was positively correlated with annual income of family, years of internet use, and daily screen and internet use time (p<0.05).

Conclusion: PIU is prevalent among undergraduate health science students at Karnali Academy. The findings emphasize the need for awareness, guidance, and proper planning to promote healthy internet usage habits among students. Educational institutions should play an active role in implementing strategies to address PIU and support students for a healthy internet use.

Keywords: Computers, Health Science, Internet Use, Medical Education, Nepal, Problematic internet use

INTRODUCTION

College students are at their significant stage of life where they develop new habits for exploring new environment. Most of the young are being engaged with internet usage for their study, information, social interaction and entertainment. However, excessive gadget use is related to various physical and mental ill-effects.^{1,2} The psychological escape mechanism associated with internet dependence has been highlighted,³ leading to discussions on the addictive nature of internet use and the need for objective evaluation methods.⁴⁻⁶ Problematic internet use (PIU) is one such evaluation approach, focusing on internet use that is risky, excessive, or impulsive, resulting in adverse consequences across various life domains, including physical, emotional, social, and functional impairment.⁴

Prevalence of PIU may differ with the population of study, time-frame and methodology, and ranges from 1.6 to 41.3% in literature.⁷⁻⁹ This also suggests that screening tests for PIU should be done in college student of varied populations.

Moreover, the open nature of the internet exposes users to privacy and security risks. Privacy breaches, such as cyberbullying, pose threats to personal lives, while security vulnerabilities are evident in financial and confidential online transactions, potentially impacting personal, professional, and social aspects.^{10,11} Despite the remote location, Jumla has witnessed a remarkable increase in internet usage among students over time. Karnali Academy of Health Sciences, located in Jumla, is a government institution dedicated to improving access

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to quality education and conducting health research.¹² However, limited research has been conducted on the computer usage patterns and prevalence of problematic internet use in this population, particularly in remote areas. Therefore, this study aims to assess the pattern of computer usage and calculate the frequency of problematic internet use among undergraduate health science students at Karnali Academy of Health Sciences, Jumla. With comprehensive investigation, we aimed to provide valuable insights for awareness and to implement guidelines promoting responsible and healthy computer gadget use.

METHODS

This cross-sectional questionnaire-based study was conducted at Karnali Academy of Health Sciences, Jumla from October to November 2022. All undergraduate students at the institute who consented were included in the study. Students were approached in person and requested to complete a structured questionnaire by themselves. In case the data were incomplete, the participant was traced and the data was collected to ensure complete data entry in the questionnaire. The questionnaire was in English language and consisted of 3 parts: (a) general demography, (b) computer usage habits (daily duration of device and internet use, common uses of the gadgets, awareness of privacy, knowledge of computer technology, and usefulness of internet in study); and (c) Problematic Internet Use Questionnaire (PIUQ), developed from a previous questionnaire by Demetrovics et al.⁶ PIUQ included 14 item 5-point Likert scale questions about the frequency of the problems related to excessive internet use. Two sample questions of PIUQ are given in the **Text box 1**. Thus the PIU score ranged from 14 to 70; higher score indicating greater degree of problem. For this study, the median value 42 was chosen as the threshold of classification of PIU. All the questionnaire were prepared by rigorous literature review according to our objectives, and experts' opinion was sought. Additionally, it was also pretested in 20 students, and the calculated Cronbach's alpha coefficient for computer use questionnaire was 0.878 and for PIUQ was 0.768. The questions were updated according to minor feedback and comments after the pretesting. Each student was explained about the process and purpose of the study verbally as well as in writing, and written consent was taken from each before data collection. Ethical clearance was taken from the Institutional Review Board, Karnali Academy of Health Sciences (Ref no. 079/080/23, 21 Sept 2022) before starting the study.)

Text box 1: Sample Problematic Internet Use Questions used in this study:

1. 'How often does your internet use impair your work or study?'
2. 'How often do you feel tense, irritated, or stressed if you cannot use internet for several days?'

The possible responses were 'Never' (score 1), 'Rarely' (2), 'Sometimes' (3), 'Often' (4) and 'Always' (5).

Descriptive and analytical statistics were performed to analyze the data in GNU PSPP software version 1.4.1. The data were presented using frequencies and percentages for categorical variables and means with standard deviations for continuous variables. The correlation

between the PIU score and other parameters was assessed using Spearman's rank correlation coefficient. The p-value of less than 0.05 was considered statistically significant.

RESULTS

Total 127 bachelor level students participated in the study, of which 47 (37%) were males. Their mean age was 22.25, range 18 to 30 years. Fifty students participated from MBBS program, 28 in nursing, 24 in midwifery, 17 in pharmacy, and 8 in public health. Students belonged to wide variety of location, from Dhankutta in east to Darchula in west of Nepal; but Jumla was the most common address.

Computer gadget use

The most common gadgets students used were smartphone (112), followed by PC (desktop or laptop) (96). Other gadgets used infrequently were tablets (7) and gaming console (1). Among the 127 students surveyed, only 2 reported infrequent or irregular use of any computer device. On an average, students have been exposed to internet for 6.09 ± 2.63 years (range <1 to 13 years). Presently, their daily use of gadgets accounted for 3.52 ± 2.02 and 4.98 ± 2.33 hours, while their internet use averaged 2.54 ± 2.05 and 3.88 ± 2.2 hours in weekdays and weekend respectively.

The most common primary use of smartphone was scrolling some social media followed by reading and watching videos, and of computer was reading followed by watching videos (**Figure 1**). The most popular social media used by the students were facebook/messenger followed by YouTube (**Figure 2**). Additionally, majority of students used google as the search engine (95.28%), while 3% did not know which one they use. Similarly, among the web browsers, google chrome was the most popular (89.4%), followed by brave and safari (3% each); the remainder used other browsers like firefox, MS edge and opera.

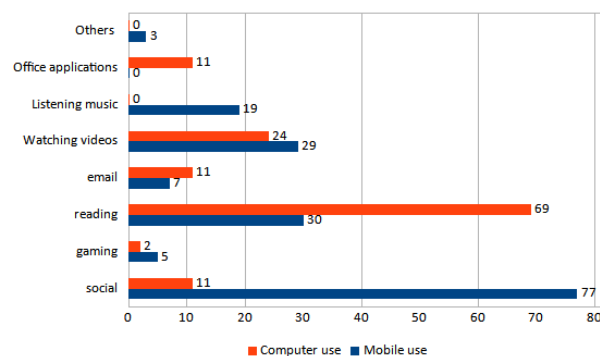


Figure 1: Common uses of gadgets by participants (multiple responses)

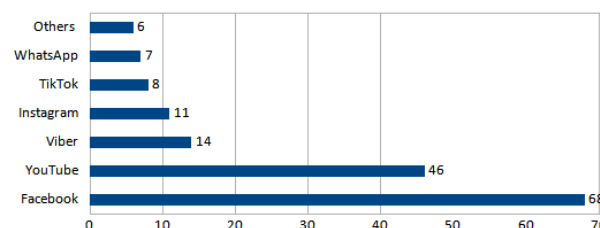


Figure 2: Social media used by participants (multiple response)

About 43% identified themselves as having working (moderate) level of computer knowledge, while 64.6% expressed their high interest in learning it. Alarming, less than a quarter of students regularly practised protecting data in their internet use, and similar proportion expressed their ignorance on how to practice it. Seventy-eight percent participants found the internet to be highly useful or are dependent on it for their study (**Table 1**)

Table 1: Computer usage parameters in participants (n=127)

Computer use parameters	Frequency	Percent
Knowledge of computer technology		
Nil	5	4
Beginner	40	31.5
Working level	55	43.3
Above average	22	17.3
Very good	5	4
Awareness and practice of digital privacy		
Not at all	3	2.4
Heard only, but not practised	4	3.2
Don't know how to practice it	30	23.6
Practice a little	61	48
Practice regularly	29	22.8
Attitude towards leakage of online personal data		
Don't care	3	2.36
Care a little	16	12.6
Care for misuse by criminals	26	20.5
Care if leaked in public	28	22.1
Very careful by default	54	42.5
Interest in learning computer technology		
Not at all	3	2.4
A little	9	7.1
Moderate	33	26
Much interested	73	57.5
Eager to learn	9	7.1
Usefulness of internet in study		
A little	2	1.6
Moderate	26	20.5
Very much	86	67.7
Dependent on internet	13	10.2

Problematic Internet Use (PIU)

Problematic internet use questionnaire included fourteen questions; Score 42 or higher was classified as PIU positive. The mean PIU score was 39.85 ± 7.89 , with median 40 and IQR 34.5 – 44.5. The participants' scores ranged from 20 to 59. Out of 127, 55 (43.31%) had problematic internet use (PIU) according to the questionnaire, and remaining 72 (56.69%) had no PIU. Females had slightly higher PIU score [41 (IQR 35-45)] compared to males [39 (IQR 33-43)], but the difference was statistically insignificant ($p=0.094$, Wilcoxon Rank-sum test).

Table 2 describes the correlation of PIU score with other parameters. The analysis revealed that PIU score was positively correlated with annual family income ($p < 0.001$), years of internet use ($p = 0.002$), and daily screen and internet use time ($p < 0.001$). These results suggest that higher levels of annual income, longer duration of internet use, and increased daily screen and internet use time were associated with higher PIU scores among the participants.

Table 2: Correlation of different parameters with the total PIU score

Parameters	Spearman Rho	P value
Annual Income	0.280*	0.001*
Sleep duration (hours) at night	0.139	0.120
Years of internet use	0.276*	0.002*
Screen use (hours) on weekdays	0.305*	<0.001*
Screen use (hours) on weekend	0.391*	<0.001*
Internet use (hours) on weekdays	0.407*	<0.001*
Internet use (hours) on weekend	0.383*	<0.001*

* Significant at 95% confidence level.

DISCUSSION

Problematic internet use (PIU) has become a growing concern among teenage and college students, given its potential detrimental effects on physical and mental health. This is a questionnaire-based cross-sectional study done on the health science students of Karnali Academy of Health Sciences, Jumla to evaluate their computer usage pattern including problematic internet use (PIU). The study found that majority of students engage in computer gadgets, mainly for social media purpose. Our students have been using internet for 6.09 years on average, indicating a significant exposure to online activities, and is higher than another study conducted on medical students on 2018 (4.76 years).² Furthermore, the average daily use of gadgets and the internet was notable, with students spending 2.54 hours on weekdays and 3.88 hours on weekends engaging with digital platforms. These figures highlight the significant role of technology in the lives of undergraduate health science students at Karnali Academy.

The frequency of PIU was quite high in our students (43.3%). The median score of all the students (40) was also near the cutoff value (42) of diagnosing PIU. This proportion has a wide range as reported in previous studies: 21.7% in Tunisian students in 2020,¹ 16.7% in Bhavanagar, India (2019),¹¹ and 41.3% in Delhi (2021).⁸ Although the prevalence was not significantly different between males and females in our study, the literature shows PIU, internet addiction or dependency to be more common in males,^{1,7,11,13,14} while others report females to have more PIU^{15,16}. Such gender variation may be attributed to geography or cultural differences, but needs

additional research in our wider population to come to a conclusion.

A study by Balhara et al in 2019 included 2634 participants from 5 Asian countries including Nepal, and 3 European countries. It showed Nepal had highest PIU (12.6%) among the 8 countries. Social media and academia were the most common uses of gadgets in Nepal.⁷ Admittedly these authors used Generalized Problematic Internet Use Scale-2 (GPIUS2) for assessing PIU, which is different from ours; but another study by Pawan Sharma et al, using the GPIUS2 scale on Nepali medical students done in 2018 found the prevalence to be 32%, which is still high.¹³ Here, PIU scale was associated with low physical activity and low life satisfaction. Compared to these studies, higher PIU in our study can be attributed to higher internet use with time, and different tool for PIU classification. Although we did use a cut-off value in the score for classification of PIU, it is essential to understand that that it is of less significance than the absolute score, as the goal is to minimize the score value. It is noteworthy that the authors Demetrovics et al, haven't supplied any such cut-off value to diagnose PIU in their questionnaire which our PIUQ is based on.⁶

The COVID-19 pandemic has also necessitated the reliance on personal devices and internet access for online learning, and has a potential effect on increasing PIU.¹⁷ Our study indicates extended computer use by the students for academic and other purposes. The PIU score was positively correlated with their family's annual income – one of the socioeconomic parameters. This is probably because wealthier families get earlier and more exposure to computer gadgets. However, a study in teenage students at Kathmandu in 2016 showed that only 15% students used internet regularly.¹⁸ An increasing duration and dependency of college students' studies and other activities on the internet with time is a common observation. Furthermore, the positive correlations between PIU and daily screen and internet use in our sample emphasize the potential impact of excessive technology consumption on problematic internet behaviours. Considering this trend, various authors stress that the screening of college students for PIU is important, and recommend that proper resources and trainings should be established in the institutes.^{7,8,19}

The most common social media our students used were facebook, YouTube and Viber; which is similar to other studies in Nepal.^{10,20} Students spent average of about 2.5 hours per day on weekdays and about 4 hours on weekend and holiday, which is comparable to other study.² Multiple studies have shown that excessive social media use is associated with mental disorder, low attention in classes and poor academic performance.^{21,22} Although sharing ourselves in social media is now ubiquitous, apart from health issues associated, there are sparse literature on the awareness and practise of protecting the user's private data in online world. The issues of invasion of digital privacy is multidimensional, ranging from data mining for identity theft and tracking of all online activities, to cybercrime, disinformation and corporate surveillance. As multiple voices are being raised in favour of individual privacy,^{23,24} we are mostly ignorant of our personal data. Our study also highlighted

the need for addressing digital privacy concerns and promoting awareness among students. The fact that majority of participants used google search engine (95%), chrome as primary browser (89%), google and facebook family of apps show that our students have been using multiple privacy-invasive platforms in their daily life.^{25,26} This also doesn't align with students' responses to privacy questions, where more than 70% expressed being aware of and using privacy practices; and 85% seemed to care for their online data. This indicates the gap in understanding of digital privacy and security issues in our students and possibly in wider young population; and further research as well as awareness is required to shade this neglected part of our digital life.

It is noteworthy that a significant proportion of students reported inadequate computer skills (beginner or working level comprising 75% of all students), but are very interested or eager in learning such technologies (65%), despite approximately half of them describing their computer knowledge as working or moderate level. Insufficient technical proficiency may hinder students' ability to effectively engage in online classes, navigate digital learning platforms, and access educational resources. Additionally, considering the high dependence on the internet reported by 78% of the participants for their studies, it is crucial for educational institutions and policymakers to implement strategies that promote healthy internet usage habits and provide appropriate support systems for students. At the same time, our study has also indicated that PIU is common in students with high daily usage of gadgets. This finding is also consistent with literature.^{1,2,11,14} Hence, it is imperative for educational institutions to provide necessary computer-related training and support, but at the same time, limiting their use, to enhance and optimize the utilization of computer gadgets as educational tools.

Limitations: This study uses a self-report measures for data collection which are subject to recall biases and social desirability effects. A cross-sectional study design means the causal relation between variables cannot be described. Although efforts were made to control for potential confounding variables, there may be unmeasured factors that could have influenced the relationships between variables. Future studies could improve on these points by making a longitudinal study design in wider sample, which can capture the effects and changes in the population's behaviours and experiences over an extended period.

CONCLUSION

A high degrees of computer gadget use and problematic internet use have been observed in the undergraduate students of Karnali Academy, which calls for timely attention, proper planning and guidance on the use of gadgets by the students. Recognizing the potential negative consequences of excessive internet use, it is crucial for institutes and education policymakers to implement strategies that regulate students' access, provide training on responsible internet use, and enhance their digital literacy. By working together, these stakeholders can take significant steps towards promoting healthy internet usage habits and fostering a balanced relationship with technology. Further studies could implement a longitudinal design to evaluate the risk factors and long term effects of

PIU in the population.

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Supplementary Files: The questionnaire is available as supplementary file. Click to [DOWNLOAD](#) it.

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