



A community-based study to estimate the internet usage and its associated factors among elderly residing in an urban slum area in North India

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ABSTRACT

Background

There has been tremendous growth in internet usage globally, with an estimated 5 billion users around the world in 2022 (1). In India, there were 840 million internet users in 2022 (2). Internet addiction, defined as the inability to control one's use of the internet despite negative consequences, often persists over an extended period (3-5). While internet addiction has been widely studied in adolescents and young adults, there are limited studies to explore internet addiction among the elderly.

Aims and Objectives

The study aimed to estimate the prevalence of internet addiction among the elderly and to determine the various factors associated with internet addiction.

Methods

This community-based cross-sectional study was conducted among 200 study participants. A semi-structured interview schedule was used for data collection. It included the socio-demographic details of the study participants and a structured schedule for assessing internet addiction using Young's Internet Addiction Test (IAT). Statistical analysis was performed using descriptive statistics, chi-square test and logistic regression.

Results

The mean age of the study participants was 66.9 years (SD = 6.8), ranging from 60 to 92 years. The distribution of categories reveals that 49.5% of participants had no internet addiction, while 36.0% had mild internet addiction. Moderate internet addiction accounted for 9.5% of the total, and severe internet addiction was found in 5.0% of the individuals. On multivariable analyses, it was found that gender (adjusted OR = 2.35, 95% CI: 1.29-4.25), marital status (adjusted OR = 2.42, 95% CI: 1.23-4.76) and personal income (adjusted OR = 5.49, 95% CI: 2.45-12.32) were significantly associated with internet addiction.

Conclusion

The high prevalence of internet addiction, along with its significant associations with gender, marital status, and personal income, suggests a need for targeted interventions focusing on education about healthy internet use among older adults. It is also recommended to collaborate with local healthcare providers and youth volunteers to educate the elderly on internet addiction. Future research should consider longitudinal designs to better understand the causal pathways and the effectiveness of different intervention strategies.

Keywords: Internet addiction, Young's Internet addiction test, Elderly

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INTRODUCTION

Internet has transformed the way people interact, communicate and engage with the world around them. There has been tremendous growth in the usage of the internet globally, with an estimated 5 billion users around the world in 2022 (1). In India alone, there were 840 million internet users in 2022 (2). While internet use was once concentrated among younger populations, the past decade has witnessed an increase in internet usage among older adults. They are increasingly using the internet for various purposes, such as staying in touch with family and friends, accessing information, and seeking entertainment. However, there is a risk of excessive internet use or "internet addiction" defined as "the inability to control one's use of the internet despite negative consequences" (3-5). This repetitive pattern of use causes various physical and mental health issues like neglect of daily tasks, poor time management, a neglected social life, sleep disturbances, eye strains and sedentary lifestyles among elderly (6-10). Despite growing relevance of internet use among elderly, there is a scarcity of research on prevalence of internet addiction among this age group (10). Existing studies have largely focused on younger individuals, leaving a gap in understanding that to what extent internet addiction affects the elderly.

Also, research has stated that several factors including socio-demographic, personal, peer influence, online dating, online shopping and access to internet are associated with internet addiction among younger adults (11-12). This study also aims to determine the factors associated with internet addiction among the elderly..

Objectives:

1. To estimate the prevalence of internet addiction among elderly.
2. To determine the various factors associated with internet addiction.

Material and Methods:

Study setting:

This community-based cross-sectional study was undertaken in one of the field practice areas of the Department of Community Medicine at Kalpana

Chawla Government Medical College, Karnal. The study area was the Urban Health Training Centre (UHTC), located in Ramnagar, Karnal, which serves a population of around 50,000.

Sample size estimation:

The sample size was estimated based on the prevalence of mild internet addiction among the elderly, which was found to be 14% in a study conducted by Devine et al. (17). Using this prevalence, at a 95% confidence interval and 5% absolute precision, the minimum sample size was calculated to be 182 using the formula $4 * p * q / r^2$, where p is the prevalence (14%), q is 1-p and r is the absolute error. The final sample size for the study was 200.

Study Design

A community-based, cross-sectional study design was employed.

Study tool

A semi-structured interview schedule was used for data collection. It comprised two parts. The first part collected the socio-demographic details of the study participants. The second part included a structured schedule for assessing internet addiction using Young's Internet Addiction Test (IAT). The IAT is a widely used 20-item questionnaire that evaluates the degree of internet addiction across various dimensions, including compulsive use, neglect of personal life, inability to control usage, and excessive time spent online. Each item is rated on a 5-point Likert scale, with scores ranging from 0 to 5. The maximum score is 100 points. Higher scores indicate a greater level of internet addiction. Based on the total score from Young's Internet Addiction Test (IAT), internet addiction is categorized into three levels. A total score between 0 and 30 indicates no addiction, scores ranging from 31 to 49 signify mild addiction; a score between 50 and 79 reflects moderate addiction and a score between 80 and 100 reflects a severe dependence on the internet. (18,19).

Inclusion criteria:

Individuals aged 60 years or above, residing in the area for the last 6 months, were included in the

study.

Exclusion Criteria

Individuals who were not willing to provide consent were excluded from the study.

Data Collection:

The list of individuals over 60 years of age was obtained from UHTC staff and field-level workers. Random sampling was employed to select 200 participants aged 60 years or older. The random selection of study participants was performed using MS Excel. The questionnaire was administered through a door-to-door survey. Selected participants were visited at their homes by frontline workers (doctors and public health nurses) and data collection was carried out after obtaining consent from the participants.

Data analysis

The collected data were entered into MS Excel, and statistical analysis was conducted using SPSS version 23. Variables were summarized using mean, median, standard deviation and percentages. Univariate analysis using the chi-square test and multivariate analysis using binomial logistic regression were performed to find out associations between variables. A p-value of <0.05 was considered statistically significant. In the multivariate analysis, the overall model fit for the binary logistic regression was found to be statistically significant, with a chi-square value of 50.3 and a p-value of <0.001 . The explanatory power of the model was assessed using Nagelkerke's pseudo-R-squared statistic, which indicated that the model explained 29.6% of the variance in the risk of developing internet addiction (Nagelkerke's $R^2 = 0.296$).

Ethical considerations

Prior approval was obtained from the Institutional Ethics Committee, KCGMC, Karnal, vide letter no. KCGMC/IEC/140, dated 25th July 2023. Written consent was taken from participants after explaining to them the purpose of the research. Confidentiality of the participants was maintained throughout the study process. For maintaining data confidentiality, all personal identifiers were given research codes.

Results

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The study included a total of 200 participants with a mean age of 66.9 years (SD = 6.8), ranging from 60 to 92 years. Table 1 shows the sociodemographic characteristics of the study participants. The distribution of participants across different age groups was as follows: 35.0% were aged below 65 years, 30.0% were between 65-69 years, 20.5% were between 70-74 years, 11.5% were between 75-79 years, and 3.0% were aged above 79 years. Out of 200 participants, 62.0% were male and 38.0% were female. In terms of education, 35.0% were illiterate, 21.0% had primary education, 15.0% completed secondary education, 9.5% finished high school, 9.5% held an intermediate/post-high school diploma, 9.0% were graduates or postgraduates, and 1.0% had a professional or doctorate. For occupation, the largest group was clerical/shop owner/farmer (31.0%), followed by unemployed (19.5%), semi-professional (17.0%), skilled (12.0%), semi-skilled (9.0%), unskilled (7.0%), and professional (4.5%). Most participants were married (70.0%), 29.0% were widowed, and 1.0% were separated. Additionally, 66.0% lived in extended/joint families, while 34.0% were in nuclear families. The study analyzed factors associated with internet addiction among 200 participants. The distribution of categories reveals that 49.5% of participants had no internet addiction, while 36.0% had mild internet addiction. Moderate internet addiction accounted for 9.5% of the total, and severe internet addiction was found in 5.0% of the individuals. Univariate analysis using the chi-square test and multivariate analysis via binomial logistic regression were conducted to assess associations between variables. Internet addiction was the dependent variable. Gender, marital status, personal income, family type and any eye disorder were taken as independent variables. The overall model test for the binary logistic regression was statistically significant, with a chi-square value of 50.3 and a P-value of < 0.001 . The model's explanatory power was evaluated using the pseudo R-squared statistic, showing that it accounted for 29.6% of the variance in the risk of developing internet addiction (Nagelkerke's $R^2 = 0.296$). Table 2 presents univariate and multivariable analyses of sociodemographic and clinical characteristics with presence of internet addiction.

Gender was significantly associated with internet addiction. Among females, 36.8% had internet addiction, while 63.2% did not. Among males, 58.9% had internet addiction, and 41.1% did not. Females were less likely to have internet addiction compared to males (adjusted OR = 2.35, 95% CI: 1.29-4.25, $p = 0.005$).

Marital status also showed a significant association with internet addiction. Married participants had a higher prevalence of internet addiction (57.9%) compared to those who were widowed or separated (33.3%). Married participants were more likely to have internet addiction compared to widowed or separated individuals (adjusted OR = 2.42, 95% CI: 1.23-4.76, $p = 0.010$). **Personal income** was another significant factor related to internet addiction. Participants without personal income had a lower prevalence of internet addiction (20.9%) compared

to those with personal income (58.6%). Participants without personal income were significantly less likely to have internet addiction than those with an income (Adjusted OR = 5.49, 95% CI: 2.45-12.32, $p < 0.001$).

Family type (extended/joint vs. nuclear) was not significantly associated with internet addiction. Participants from extended/joint families had a similar prevalence of internet addiction (50.4%) compared to those from nuclear families (50.7%) (Adjusted OR = 0.96, 95% CI: 0.538-1.74, $p = 0.918$).

Similarly, the presence of **eye disorders** was not significantly associated with internet addiction. Among participants with eye disorders, 50.0% had internet addiction compared to 50.9% among those without eye disorders (Adjusted OR = 1.09, 95% CI: 0.62-1.94, $p = 0.757$).

Table 1 Sociodemographic characteristics of study participants

Characteristic	All Participants N=200
Age (Mean, SD)	66.90 (6.80)
Range	60 - 92
Age group	
<65	70 (35.00%)
65-69	60 (30.00%)
70-74	41 (20.50%)
75-79	23 (11.50%)
>79	06 (03.00%)
Gender	
Male	124 (62.00%)
Female	76 (38.00%)
Education	
Illiterate	70 (35.00%)
Primary	42 (21.00%)
Secondary	30 (15.00%)
High School	19 (09.50%)
Intermediate/post high school diploma	19 (09.50%)
Graduate/Post Graduate	18 (09.00%)
Professional/doctorate	2 (1.00%)
Occupation	
Clerical/shop-owner/farmer	62 (31.00%)
Unemployed	39 (19.50%)
Semi-Professional	34 (17.00%)
Skilled worker	24 (12.00%)
Semi-skilled worker	18 (09.00%)

Unskilled worker	14 (07.00%)
Professional	09 (04.50%)
Marital status	
Married	140 (70.00%)
Widowed	58 (29.00%)
Separated	02 (01.00%)
Family Type	
Extended/Joint	131 (66.00%)
Nuclear	69 (34.00%)

Table 2 Univariate and multivariable analyses of sociodemographic and clinical characteristics with presence of Internet Addiction

Characteristic	Internet Addiction-Absent N=99	Internet Addiction-Present N=101	OR (95% CI)	Adjusted OR (95% CI)	P value
Gender					
Female	48 (63.20%)	28 (36.80%)	2.45 (1.36-4.42)	2.35 (1.29-4.25)	0.005
Male	51 (41.10%)	73 (58.90%)			
Marital status					
Married	59 (42.10%)	81 (57.90%)	2.75 (1.46-5.17)	2.42 (1.23-4.76)	0.010
Widowed/Separated	40 (66.70%)	20 (33.30%)			
Personal income					
No	34 (79.10%)	09 (20.90%)	5.35 (2.40-11.90)	5.49 (2.45-12.32)	<0.001
Yes	65 (41.40%)	92 (58.60%)			
Family Type					
Extended/Joint	65 (49.60%)	66 (50.40%)	1.01 (0.566-1.82)	0.96 (0.538-1.74)	0.918
Nuclear	34 (49.30%)	35 (50.70%)			
Any eye disorder					
No	52 (49.10%)	54 (50.90%)	0.96 (0.553-1.68)	1.09 (0.62-1.94)	0.757
Yes	47 (50.00%)	47 (50.00%)			

DISCUSSION

The findings revealed a high prevalence of internet addiction among the elderly population, indicating a growing concern for internet addiction in this age group. Notably, significant associations were observed between internet addiction and demographic factors such as gender, marital status, and personal income. These associations suggest

that certain groups within the elderly population may be more vulnerable to developing internet addiction, potentially due to differing social roles, support systems, and financial independence. The study by Reed et al. found that internet addiction among elderly individuals is fairly common. Around 30% of the people in their study showed mild to

more severe levels of addiction based on scores from the Internet Addiction Test (IAT) (13). Our study has revealed that 36.00% of the sample had mild internet addiction. This is consistent with other studies that demonstrate the vulnerability of older adults to internet addiction. The study by Reed et al. however, showed differences in mean IAT scores between males and females, though the difference was not statistically significant. Our study, however, revealed a statistically significant gender difference in internet addiction between (gender) males and females, with males being more addicted. This suggests that internet addiction among the elderly might be heavily influenced by gender. In many cultures, men are more free to spend extended time online, while women might have other responsibilities like household chores that limit internet use.

The values, traditions, and practices largely shape gender roles and behaviors in a society. (13) Rochat et al., conducted a study among internet users above 60 years of age in Switzerland and Poland using the Compulsive Internet Use Scale (CIUS) (14). They found that being a Swiss participant was significantly associated with a higher CIUS score. This association remained significant even after controlling for factors like age, education level and gender. It highlights the role of cultural or regional factors in influencing internet use behavior among the elderly. These findings suggest that sociocultural context could be a key factor in understanding internet addiction among the elderly.

Jia et al. found that loneliness is correlated with internet addiction, with a correlation coefficient of $R = 0.321$ (15). This highlights the crucial role of social connections in reducing the risk of internet addiction among older adults. As social support diminishes, elderly individuals may increasingly rely on the internet to compensate, which can lead to addictive behaviors. Similarly, Reed et al. found that internet addiction is associated with mental health issues like anxiety and depression, suggesting that addressing loneliness and social support could help mitigate internet addiction in this population (13).

Finally, Devine et al. provided a global perspective on internet addiction among individuals aged 55 and

older, reporting that 14% of this age group experienced mild levels of internet addiction. They found that internet addiction was a significant predictor of depression scores, with an adjusted R-squared of 0.25, suggesting a strong relationship between internet addiction and depression in this population. The study also noted that income was a significant predictor of internet addiction, whereas age was only marginally significant. In our study as well, personal income came out to be significantly associated with internet addiction. (17) This suggests that socioeconomic factors, along with psychological well-being, play a critical role in the development of internet addiction among the elderly. Our study did not show any significant association between type of family (nuclear or extended) or any eye disorder with internet addiction among elderly. To our knowledge there are no other studies that have included these variables, which limits comparisons with existing literature.

LIMITATION

Firstly, it is essential to highlight that this is one of the first studies exploring internet addiction among the elderly in the Indian context, paving the way for further research in this critical area. However, our study did not encompass other variables such as loneliness, online shopping and peer influence that may significantly influence internet use. As more elderly individuals turn to e-commerce for convenience and accessibility, understanding its implications for internet usage patterns is critical. Given these limitations, we recommend that future research should incorporate these variables to gain a more holistic understanding of the factors contributing to internet addiction among the elderly.

Also, education focused interventions like engaging local healthcare providers to educate elderly patients on internet addiction during regular check-ups is recommended. Local youth volunteers can be encouraged to teach the elderly safe internet practices. Public awareness campaigns can be carried out using local media, informing the elderly about internet addiction.

CONCLUSION

Future research should consider longitudinal



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designs to better understand the causal pathways and the effectiveness of different intervention strategies. Additionally, culture sensitive research is needed to explore how regional and cultural factors influence internet usage behaviours among elderly.

This can help in designing tailored interventions for individual well-being and policy development regarding the elderly population's engagement in technology in ensuring a healthy community health.

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