

The digital health dilemma: Exploring cyberchondria, well-being, and smartphone addiction in medical and non-medical undergraduates

Vibhor Agrawal, Yashita Khulbe, Amit Singh¹, Sujita K. Kar¹

Faculty of Medical Sciences, King George's Medical University, ¹Department of Psychiatry, King George's Medical University, Lucknow, Uttar Pradesh, India

ABSTRACT

Background: The Internet is a popular source of health information, but too much research can cause anxiety (cyberchondria). Medical and non-medical personnel interpret information differently, leading to varying rates of cyberchondria. Smartphone addiction may also contribute to cyberchondria and impact mental health.

Methods: The study was an epidemiological survey-based investigation with a cross-sectional design involving undergraduate students (aged 18 years or older) from Indian universities or colleges. The study utilized the Cyberchondria Severity Scale-Short Form (CSS-12), WHO-5 well-being index, and Smartphone Addiction Scale-Short Version (SAS-SV).

Results: A total of 1033 participants (53.1% females and 46.4% males) were recruited in the survey. Of the participants, 58.5% were pursuing medical or paramedical courses, while the remaining 41.5% belonged to the non-medical group. High-severity cyberchondria was present in about 4.4% of the students. The medical cohort demonstrated a significantly lower cumulative CSS in comparison to the non-medical cohort ($t = -3.90$; $P < 0.01$). Smartphone addiction was observed in 57.2% of individuals in the medical group and 55.9% of individuals in the non-medical group ($P = 0.68$). Medical students had a significantly lower mean well-being score compared to non-medical students (58.4 vs. 59.6; $P < 0.01$). There was a positive correlation between cyberchondria severity and smartphone addiction, which was consistent across both groups.

Conclusion: Medical students have less cyberchondria than non-medical students. Cyberchondria severity is linked to smartphone addiction. Non-medical students with cyberchondria have higher subjective well-being.

Key words: Cyberchondria, health anxiety, smartphone addiction, subjective well-being

INTRODUCTION

In recent years, the advent of the Internet has fundamentally transformed the dynamics of information seeking and retrieval,

reshaping multiple facets of our lives, including healthcare and health-related behaviors. A recent survey spanning 12 countries and encompassing 12,262 participants revealed that a notable range of 12% to 40% of individuals frequently resort to the Internet to access medical information. Moreover, approximately half of these individuals employ this digital platform for the purpose of self-diagnosis.^[1] The Internet is preferred for health information due to its convenience,

Address for correspondence: Dr. Sujita K. Kar,
Department of Psychiatry, King George's Medical University,
Lucknow, Uttar Pradesh, India.
E-mail: drsujita@gmail.com

Submitted: 31-Jul-2023, **Revised:** 28-Feb-2024,
Accepted: 28-Feb-2024, **Published:** 18-Mar-2024

Access this article online	
Website: https://journals.lww.com/indianjpsychiatry	Quick Response Code 
DOI: 10.4103/indianjpsychiatry.indianjpsychiatry_570_23	

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Agrawal V, Khulbe Y, Singh A, Kar SK. The digital health dilemma: Exploring cyberchondria, well-being, and smartphone addiction in medical and non-medical undergraduates. Indian J Psychiatry 2024;66:256-62.

privacy, anonymity, and speed.^[2] A notable consequence of this is the emergence of a phenomenon known as cyberchondria. Coined by the UK press in the mid-1990s, the term “cyberchondria” is a portmanteau of “cyber” (pertaining to the Internet) and “hypochondria” (excessive worry about having a serious medical condition).^[3] It describes a phenomenon characterized by the repetitive and time-consuming pattern of engaging in online health research, often accompanied by an element of compulsiveness.^[4,5] This behavior ultimately culminates in heightened apprehension regarding one's health and subsequently propels individuals toward seeking reassurance from the healthcare system, driven by anxiety-induced concerns.^[5,6]

The gravity of the phenomenon of cyberchondria becomes evident when considering its association with heightened levels of health anxiety.^[6] While some studies suggest a strong association between the two,^[7–9] others propose that cyberchondria and health anxiety are distinct entities.^[9,10] Nonetheless, the presence of obsessive–compulsive symptoms in relation to cyberchondria has been consistently observed.^[11–13] Individuals experiencing cyberchondria exhibit obsessive doubts about their own health and feel compelled to excessively utilize the Internet for medical information.^[14] Moreover, a compelling link has been established between cyberchondria and intolerance of uncertainty regarding health symptoms.^[15] Cyberchondria can worsen people's health by making them rely too much on online health information. This urgent public health issue affects mental health, healthcare usage, and overall well-being.

The prevalence of cyberchondriac behavior, particularly among students, is a subject of increasing concern. University and college students, in particular, represent a population that is tech-savvy and heavily reliant on the Internet for various purposes, including health information seeking. The unique psychosocial characteristics of this demographic, such as the transition to adulthood, academic stress, and peer influence, may interact with cyberchondria, potentially exacerbating its effects. Moreover, it is essential to acknowledge that cyberchondriac behavior may also vary across medical and non-medical students, given their distinct educational backgrounds and professional contexts. The extensive medical training and exposure to healthcare information among medical students may influence their online health information-seeking behaviors, potentially leading to unique patterns of cyberchondriac behavior. In contrast, non-medical students may approach health-related information with different perspectives and levels of knowledge, potentially influencing their engagement with online health resources in distinct ways. Differentiating cyberchondriac behavior between medical and non-medical students represents a crucial avenue of inquiry, as it has the potential to unveil distinct patterns and prevalence rates within these specific student groups.

Furthermore, smartphones have become an indispensable part of today's population. Given the ubiquitous presence of smartphones and their pivotal role in facilitating access to online health information, it is not improbable that individuals displaying excessive smartphone use may be more prone to developing cyberchondriac behaviors.^[16,17] Conversely, cyberchondriac behavior may also contribute to smartphone addiction, as the repetitive and time-consuming nature of seeking reassurance through online health research can reinforce the compulsive use of smartphones.^[18] The ease of access, immediate gratification, and constant availability of health information on smartphones may provide a reinforcing loop that perpetuates both cyberchondriac behavior and smartphone addiction. While the exact nature and extent of the association between cyberchondria and smartphone addiction remain speculative, exploring this potential link is crucial to inform targeted interventions, preventive strategies, and therapeutic approaches that address both phenomena concurrently.

While several studies have investigated cyberchondriac behavior and problematic smartphone usage among different population groups,^[19–21] there is a dearth of comprehensive research specifically targeting the student population, particularly with regard to the distinction between medical and non-medical undergraduates. Since the health-related understanding is expected to differ between medical and non-medical undergraduates owing to the nature of their training,^[22–24] it is likely to influence their online information-seeking behavior related to health matters. Therefore, the aim of this cross-sectional study is to determine the extent of cyberchondriac behavior among these distinct student groups. Furthermore, the study sought to investigate the potential correlation between cyberchondria and smartphone addiction, with an additional focus on examining how these variables impact the overall well-being of these specific populations.

METHODS

The study was a cross-sectional online survey conducted between October 2021 and July 2022. The estimated sample size was 1041 using a confidence level of 99%, population proportion of 50%, and a margin of error of 4%. The study population consisted of undergraduate students from Indian universities and colleges who were 18 years of age or older, had access to a smartphone with an active Internet connection, were active on any social media platform, could read and understand English, and provided informed consent. Participants who had any previously diagnosed psychiatric illness were excluded from the study. The Institutional Ethics Committee approved the study (Ref. code: 113th ECM IIA/P16).

Data collection tools

For the distribution of the survey, a Google Form was created, incorporating the following data collection tools:

Sociodemographic and clinical details form

A semi-structured questionnaire was administered to assess the general profile of the respondents, including sociodemographic, academic, and clinical details.

Cyberchondria severity scale-short form (CSS-12)

The CSS-12 is a self-report scale consisting of 12 items. Respondents rate the items on a five-point Likert scale, ranging from 1 (never) to 5 (always). The scale is divided into four correlated domains, namely—Excessiveness, Distress, Compulsion, and Reassurance. The individual item scores can be summed to calculate a total score ranging from 0 to 60. A higher score indicates greater severity of cyberchondriac behavior.^[25] The CSS-12 scores were categorized into three categories - low cyberchondria ($\leq 25^{\text{th}}$ percentile), moderate cyberchondria (26^{th} to 74^{th} percentile), and high cyberchondria ($\geq 75^{\text{th}}$ percentile).^[17]

Smartphone addiction scale-short version (SAS-SV)

The SAS-SV is also a self-rated scale consisting of 10 items. The items are rated on a 6-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree).^[26] The scale focuses on five aspects of smartphone addiction: daily-life disturbance, withdrawal, cyberspace-oriented relationship, overuse, and tolerance. For smartphone addiction, the cut-off score is 31 for males and 33 for females.^[26]

WHO-5 Well-being Index (WHO-5)

The WHO-5 is a self-administered scale consisting of five items. Participants rate the items on a 6-point Likert scale, ranging from 0 (never) to 5 (always). The raw score is calculated by summing the responses, resulting in a score ranging from 0 to 25. A higher score reflects a better general subjective well-being.^[27]

Data collection

To conduct this online survey, the authors e-mailed/distributed the survey in their personal, social, and professional networks. The survey distribution was not limited to traditional email channels but extended to the vast reach of popular social media platforms, including WhatsApp, Facebook, LinkedIn, and Twitter. The survey questionnaire contained a brief introduction of the survey, a consent form, and the aforementioned data collection tools. The lead investigator's contact information was included to address any questions or concerns regarding the study or questionnaire. The interested participants were asked to provide consent before participation. An inquiry was made regarding the presence of any recent psychiatric illness (diagnosed by a clinician). If participants answered "yes" to the question, the survey was considered complete at that point. However, if the respondent answered "no," additional survey questions would be displayed on the screen. The aforementioned data collection tools were used to collect participant responses. It took participants around 10-15 minutes to complete the survey. Only complete

participant forms were included in the final analysis. Throughout the study and publication of the results, the survey abstained from using any personal identifiers. Additionally, no incentives were provided to encourage survey participation.

Data analysis

Data management and analysis involved exporting the collected data from Google Forms to Microsoft Excel 2016. Statistical analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 25.0.^[28] The descriptive analysis determined the percentage of individuals exhibiting similar levels of cyberchondriac behavior, subjective well-being, and smartphone addiction. An unpaired *t*-test was performed to compare the mean scores of the three scales between medical and non-medical students, aiming to identify any statistically significant differences. Pearson correlation was used to explore potential associations among variables.

RESULTS

In the conducted survey, a total of 1242 individuals actively participated, out of which 1033 responses were found to meet the predetermined selection criteria and were subsequently subjected to analysis [Figure 1]. The number of female and male participants was 549 (53.1%) and 479 (46.4%), respectively. Five participants preferred not to reveal their gender. The average age of the study sample was 20.74 ± 1.82 years. The majority of participants ($n = 873$, 84.9%) belonged to an urban background. In terms of educational pursuits, 58.5% ($n = 605$) of the participants were pursuing medical/dental/nursing or paramedical courses (hereafter known as the medical cohort for convenience), with 280 (46.28%) males and 321 (53.05%) females. Meanwhile, the remaining 428 (41.5%) participants, including 199 (46.5%) males and 228 (53.27%) females, were engaged in various other fields such as engineering, arts, commerce, etc., (hereafter known as the non-medical cohort for convenience). The mean age of the medical group was 21.31 ± 1.67 years, whereas the non-medical group had a mean age of 19.92 ± 1.71 years. A statistical comparison using an independent samples *t*-test revealed a significant difference between the mean age of the two groups ($t = 12.9$; $P < 0.01$).

It was found that 4.4% of participants had high cyberchondria severity, 62.1% of participants had moderate severity of cyberchondria, and 33.5% had low severity of cyberchondria. When considering the two sub-groups, the medical cohort demonstrated a significantly lower cumulative cyberchondria severity score in comparison to the non-medical cohort ($t = -3.90$; $P < 0.01$). This trend was consistently observed across the distress ($t = -3.93$; $P < 0.01$) and reassurance-seeking ($t = -4.88$; $P < 0.01$), excessiveness ($t = -2.24$; $P < 0.05$), and compulsion ($t = -2.24$; $P < 0.05$) subscales [Table 1].

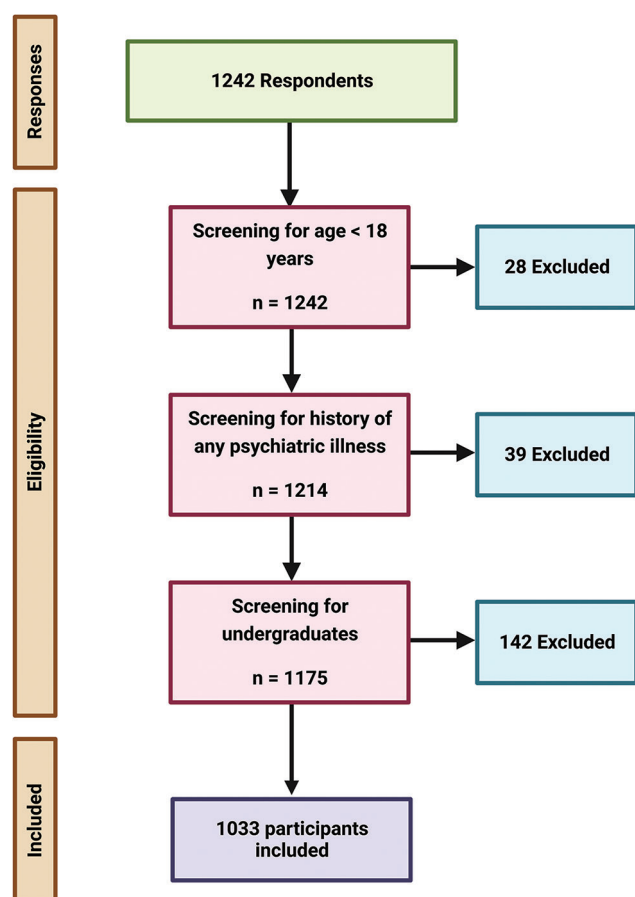


Figure 1: Flowchart describing the selection of participants

The overall proportion of participants with smartphone addiction was 56.4%. Further analysis by sub-groups revealed that 57.2% ($n = 344$) of individuals in the medical group and 55.9% ($n = 239$) of individuals in the non-medical group exhibited symptoms of smartphone addiction. The mean score for smartphone addiction in the medical group was 33.7 ± 10.8 , while in the non-medical group, it was 34.3 ± 11.3 [Table 1]. However, there was no significant difference between the two groups ($t = -0.83$; $P = 0.40$). Gender-based exploratory analysis of the data revealed a higher proportion of males with smartphone addiction (male, 60.8%; female, 53.2%; $\chi^2 = 5.96$; $P < 0.05$). However, there was no significant difference between males and females in terms of the overall cyberchondria score or any of its subscales.

Moving on to smartphone use duration, it was categorized into three categories: <3 hours, 3-6 hours, and >6 hours. The majority of individuals in both groups fell into the 3-6 hour category, with 54.9% in the medical group and 51.4% in the non-medical group. Additionally, 21.2% vs. 24.1% of individuals belonged to the <3-hour category, while 23.9% vs. 24.5% of individuals had >6 hours of smartphone use duration. However, the distribution of smartphone use duration did not differ significantly between the two groups ($\chi^2 = 1.54$; $P = 0.46$) [Table 1].

Table 1: Streamwise comparison of smartphone addiction severity score, cyberchondria severity score, and WHO well-being score

Variables	Medical $n=605$ Mean $\pm$ SD or n (%)	Non-medical $n=428$ Mean $\pm$ SD or n (%)	χ^2/t ; P
Smartphone use duration			
<3 h	128 (21.2)	103 (24.1)	1.54; 0.46
3-6 h	332 (54.9)	220 (51.4)	
>6 h	145 (23.9)	105 (24.5)	
Smartphone addiction [#]			
Present	344 (57.2)	239 (55.9)	0.16; 0.68
Absent	257 (42.7)	188 (44.0)	
SAS	33.7 $\pm$ 10.8	34.3 $\pm$ 11.3	-0.83; 0.40
CSS	28.8 $\pm$ 10.3	31.4 $\pm$ 10.9	-3.90; <0.01**
Excessiveness	8.27 $\pm$ 2.92	8.69 $\pm$ 3.13	-2.24; 0.02*
Distress	7.35 $\pm$ 3.12	8.16 $\pm$ 3.39	-3.93; <0.01**
Reassurance seeking	6.53 $\pm$ 2.93	7.47 $\pm$ 3.14	-4.88; <0.01**
Compulsion	6.72 $\pm$ 2.96	7.16 $\pm$ 3.25	-2.24; 0.02*
WHO-5	58.4 $\pm$ 18.4	59.6 $\pm$ 22.9	-0.95; 0.34

(CSS, Cyberchondria Severity Scale Score; WHO-5, WHO-5 well-being score; SAS, Smartphone addiction scale). *Significant at the level of 0.05.

**Significant at the level of 0.01. [#]Estimated for $n=1028$

Regarding the WHO well-being index scores, we categorized them into four percentiles: $\leq 25^{\text{th}}$ percentile, $26^{\text{th}}-50^{\text{th}}$ percentile, $51^{\text{st}}-75^{\text{th}}$ percentile, and $> 75^{\text{th}}$ percentile. Our findings revealed that 7.4% of participants scored within the $\leq 25^{\text{th}}$ percentile, 25.1% fell within the $26-50^{\text{th}}$ percentile, 44.1% had scores between the 51^{st} and 75^{th} percentile, and 23.4% scored above the 75^{th} percentile. Analyzing the mean scores, we found no significant difference between the two cohorts ($t = -0.95$; $P = 0.34$). Specifically, medical students had a mean well-being score of 58.4 ± 18.4 , while non-medical individuals had a mean score of 59.6 ± 22.9 [Table 1].

Our correlational analysis revealed several noteworthy findings. Firstly, there was a significant positive correlation between cyberchondria severity and smartphone addiction. The variation in SAS score accounts for around 17.3% variance in CSS. This association held true for both the medical and non-medical groups, indicating that individuals with higher levels of cyberchondria tend to exhibit greater smartphone addiction [Table 2]. Furthermore, we found a significant positive correlation between cyberchondria and the WHO well-being index. However, the variance explained by one variable on the other is only 0.81%, implying a weak relationship between them. This association remained significant when comparing the non-medical cohort. However, the correlation became statistically insignificant within the medical cohort, suggesting a potential divergence in the relationship between cyberchondria and well-being among medical students [Table 2]. However, we discovered a significant negative correlation between smartphone addiction and the WHO well-being index. However, the association between the variables was weak. This negative association was consistent across both the medical and non-medical groups, indicating that higher levels of

Table 2: Correlation between smartphone addiction severity score, cyberchondria severity score, WHO well-being score, and smartphone use duration

	Smartphone Use Duration	WHO-5	CSS	SAS
Total Cohort, <i>n</i> =1033				
Smartphone use duration	1			
WHO-5	-0.208**	1		
CSS	0.012	0.093**	1	
SAS	0.356**	-0.137**	0.416**	1
Medical Cohort, <i>n</i> =605				
Smartphone use duration	1			
WHO-5	-0.180**	1		
CSS	0.001	0.047	1	
SAS	0.352**	-0.146**	0.380**	1
Non-Medical Cohort, <i>n</i> =428				
Smartphone use duration	1			
WHO-5	-0.239**	1		
CSS	0.033	0.140**	1	
SAS	0.362**	-0.130**	0.463**	1

CSS, Cyberchondria Severity Scale Score; WHO-5, WHO-5 well-being score; SAS, Smartphone addiction scale. **Correlation is significant at the 0.01 level (two-tailed)

smartphone addiction tend to be associated with lower levels of well-being [Table 2]. In terms of smartphone use duration, we did not observe any significant correlation with cyberchondria. However, it exhibited a significant negative correlation with the WHO well-being index, implying that longer durations of smartphone use were associated with lower levels of well-being ($r = -0.208$). Additionally, smartphone use duration demonstrated a significant positive correlation with smartphone addiction ($r = 0.356$), indicating that as the duration of smartphone use increased, so did the severity of smartphone addiction. These correlations held true across both the medical and non-medical groups [Table 2].

DISCUSSION

The current understanding of cyberchondria as a clinical entity is limited by the lack of enough research. Being a relatively new concept, there is a lack of clarity as to whether cyberchondria represents a new, separate, and autonomous disorder or a common phenomenological manifestation present in a range of established psychiatric disorders. Within such circumstances, it is important to identify vulnerability factors that may promote cyberchondriac behavior and the effects it may impose on the physical and mental well-being of people. Our study found a high level of cyberchondria severity in 4.4% of participants. The majority of participants, 62.1%, presented with moderate severity of cyberchondria, while 33.5% had low severity of cyberchondria. These findings indicate that cyberchondria is a common occurrence among the population studied, with varying degrees of severity. A recent study from a Pakistan university found the prevalence of moderate and severe cyberchondria to be 50.4% and 23.80%, respectively.^[29] An Indian study, found the prevalence of cyberchondria among employees of the

information technology sector to be 55.6%.^[30] Another Indian study conducted in adult population during COVID-19 pandemic found the prevalence of cyberchondria to be 45.3%.^[31] A study conducted on undergraduate students of a degree college found the prevalence of cyberchondria to be 22.5%.^[32] These findings indicate that there is a significant variation in the prevalence of cyberchondria and the variations may be dependent on the context, nature of population, and geographical locations. The results of this study demonstrate a noteworthy distinction between medical undergraduates and their non-medical counterparts concerning cyberchondria susceptibility. These findings suggest that individuals with medical knowledge and training exhibit lower levels of health-related anxiety and online health information-seeking behaviors. These outcomes may be attributed to the cultivation of critical appraisal skills and a heightened understanding of medical concepts among medical students,^[33] which potentially contribute to their reduced vulnerability to cyberchondria. However, a study found a significant positive correlation between cyberchondria severity score and health literacy.^[17] The difference in our findings can be explained as a compensatory phenomenon, i.e., students from non-medical background search for more illness and health-related information online due to their lack of adequate health-related knowledge. Moreover, on the evaluation of subscales of the cyberchondria severity scale, non-medical students showed significantly higher levels of distress, reassurance-seeking, excessiveness, and compulsion. This is supported by similar findings reported in a study on engineering undergraduates in India, and all the participants were found to be affected by excessiveness and reassurance, with reassurance severely affecting more than half of the participants.^[19]

Numerous studies investigating smartphone addiction among student populations have consistently reported high prevalence rates.^[34–38] Similarly, our study found a substantial proportion of smartphone addiction in the overall participant sample. Notably, this proportion did not differ significantly between medical and non-medical students. However, an intriguing observation emerged when considering gender differences, with males exhibiting a significantly higher proportion of smartphone addiction. This aligns with previous Indian studies that have reported higher addiction rates among males, both in the general population and medical graduates.^[36,38–40] These issues have profound implications for students' health and well-being, contributing to heightened levels of anxiety, depression, sleep disturbances, impaired academic performance, and strained interpersonal relationships.^[41–43]

Another salient finding of this study is the significant association established between cyberchondria severity and smartphone addiction, which persists across both the medical and non-medical groups. This interrelationship highlights the interconnected nature of these phenomena,

where individuals who engage in compulsive health-related Internet searches are more likely to exhibit problematic smartphone usage patterns. Due to unlimited and unsupervised access to information on the Internet, smartphone addiction, and consequently cyberchondria, are increasingly prevalent among young individuals, particularly students. This is supported by previous research, such as a study conducted in Saudi Arabia, which reported a high prevalence of cyberchondria and smartphone addiction among participants.^[17] Similarly, a study involving medical undergraduates in India found a considerable proportion of students experiencing cyberchondria, particularly among those with extensive Internet use.^[20] The observed association underscores the importance of targeted interventions addressing both cyberchondria and smartphone addiction, given their potentially detrimental effects on individuals' well-being and psychological distress.

Evidence suggests a negative association between excessive smartphone use and general subjective well-being.^[44–46] We found a similar association of smartphone addiction severity and smartphone use duration with subjective well-being, indicating that a longer duration of smartphone use leads to the development of some degree of smartphone addiction and poor subjective well-being. However, the small correlation between the variables means little practically meaningful effect of one variable on the other. Although we had hypothesized a negative correlation between cyberchondria severity and subjective well-being, our findings revealed a significant positive correlation between the two. This may be due to the fact that subjective well-being is a complex construct that can be influenced by multiple factors. It is also possible that the relationship between cyberchondria and subjective well-being is non-linear. Earlier studies have shown a negative correlation between cyberchondria severity and subjective well-being.^[47] A mediating role of Internet addiction in the relationship between cyberchondria and health anxiety has been suggested. Additionally, underlying personality traits can influence internet addiction and subjective well-being.^[48] As the participants in our study were from the general population and none of them reportedly have been diagnosed with psychiatric illness, the severity of cyberchondria in the study population might be different from the severity in the patient population.

In light of the increasing prevalence of cyberchondria and its associated negative outcomes, it is crucial to gain a deeper understanding of the risk factors contributing to its development and the potential strategies for intervention. The present study sheds light on these issues and provides valuable insights for the development of targeted interventions aimed at assisting students in managing cyberchondriac behaviors effectively. The findings of this study emphasize the significance of developing targeted interventions to address the rising issue of cyberchondria

among students. By promoting responsible internet use, teaching healthy smartphone habits, and providing counseling and support groups, students can better manage their concerns and anxieties related to health issues. Collaborative efforts involving parents and families can enhance the effectiveness of these interventions, creating a supportive ecosystem that nurtures students' well-being and fosters responsible digital behavior.

STRENGTHS AND LIMITATIONS

The study demonstrates several notable strengths in its design and reliability. The study employed a large sample size, with a total of 1033 participants meeting the predetermined selection criteria, and used validated tools to accurately measure the outcome.

However, some limitations are worth noting. The study employed a cross-sectional design, which limits the ability to establish causal relationships between variables. Longitudinal studies would provide a better understanding of the temporal associations between cyberchondria, smartphone addiction, and well-being. Moreover, the study relied on self-report measures, which are subject to recall and response biases. Participants' responses may be influenced by social desirability or personal interpretations, potentially affecting the accuracy of the reported data. Additionally, the study focused on undergraduate students from Indian universities, which may restrict the generalizability of the findings to other populations or cultural contexts. Also, the lack of information of the participants regarding their geographical distribution and socio-cultural background, limit generalizability of the findings. Individuals who are motivated and interested in participating in the survey and have access to Internet and social media platforms often were more likely to participate in the survey, which limits the representativeness of the sample population. As there is no cut-off scores for cyberchondria, we tried to describe the data in terms of percentile, which is another limitation of the study. The results may not be representative of individuals in different age groups at different levels of education. Furthermore, the study did not consider potential confounding factors that could influence the relationships between the variables of interest. Factors such as socioeconomic status, prior mental health conditions, or access to healthcare resources could have influenced the outcomes but were not accounted for in the analysis.

CONCLUSION

High cyberchondria severity is present in about 4.4% of undergraduate students. Medical undergraduates exhibit lower susceptibility to cyberchondria compared to non-medical students. Majority of the participants have a moderate degree of cyberchondriac behavior. Furthermore, a significant association was observed between cyberchondria severity and smartphone addiction. These results underscore

the importance of targeted interventions addressing smartphone addiction and its impact on cyberchondria and overall well-being in this specific population.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- McDaid D, Park A-L. Online Health: Untangling the Web. 2011.
- Cotten SR, Gupta SS. Characteristics of online and offline health information seekers and factors that discriminate between them. *Soc Sci Med* 2004;59:1795–806.
- Loos A. Cyberchondria: Too much information for the health anxious patient? *J Consum Health Internet* 2013;17:439–45.
- Starcevic V. Cyberchondria: Challenges of problematic online searches for health-related information. *Psychother Psychosom* 2017;86:129–33.
- McElroy E, Shevlin M. The development and initial validation of the cyberchondria severity scale (CSS). *J Anxiety Disord* 2014;28:259–65.
- Menon V, Kar SK, Tripathi A, Nebhinani N, Varadharajan N. Cyberchondria: Conceptual relation with health anxiety, assessment, management and prevention. *Asian J Psychiatry* 2020;53:102225.
- Fergus TA. The Cyberchondria Severity Scale (CSS): An examination of structure and relations with health anxiety in a community sample. *J Anxiety Disord* 2014;28:504–10.
- McMullan RD, Berle D, Arnáez S, Starcevic V. The relationships between health anxiety, online health information seeking, and cyberchondria: Systematic review and meta-analysis. *J Affect Disord* 2019;245:270–8.
- Starcevic V, Baggio S, Berle D, Khazaal Y, Viswasam K. Cyberchondria and its relationships with related constructs: A network analysis. *Psychiatr Q* 2019;90:491–505.
- Mathes BM, Norr AM, Allan NP, Albanese BJ, Schmidt NB. Cyberchondria: Overlap with health anxiety and unique relations with impairment, quality of life, and service utilization. *Psychiatry Res* 2018;261:204–11.
- Bajcar B, Babiak J, Olchowska-Kotla A. Cyberchondria and its measurement. The Polish adaptation and psychometric properties of the Cyberchondria Severity Scale CSS-PL. *Psychiatr Pol* 2019;53:49–60.
- Fergus TA, Russell LH. Does cyberchondria overlap with health anxiety and obsessive-compulsive symptoms? An examination of latent structure and scale interrelations. *J Anxiety Disord* 2016;38:88–94.
- Vismara M, Caricasole V, Starcevic V, Cinosi E, Dell'Oso B, Martinotti G, *et al.* Is cyberchondria a new transdiagnostic digital compulsive syndrome? A systematic review of the evidence. *Compr Psychiatry* 2020;99:152167.
- Khazaal Y, Chatton A, Rochat L, Hede V, Viswasam K, Penzenstadler L, *et al.* Compulsive health-related internet use and cyberchondria. *Eur Addict Res* 2021;27:58–66.
- Fergus TA. Cyberchondria and intolerance of uncertainty: Examining when individuals experience health anxiety in response to internet searches for medical information. *Cyberpsychol Behav Soc Netw* 2013;16:735–9.
- Köse S, Murat M. Examination of the relationship between smartphone addiction and cyberchondria in adolescents. *Arch Psychiatr Nurs* 2021;35:563–70.
- El-Zayat A, Namnkani SA, Alshareef NA, Mustafa MM, Eminaga NS, Algarni GA. Cyberchondria and its association with smartphone addiction and electronic health literacy among a Saudi population. *Saudi J Med Sci* 2023;11:162-8.
- Vujić A, Volarov M, Latas M, Demetrovics Z, Kiraly O, Szabo A. Are Cyberchondria and Intolerance of Uncertainty Related to Smartphone Addiction? *Int J Ment Health Addict* 2023;1-19.
- Dagar D, Kakodkar P, Shetiya SH. Evaluating the cyberchondria construct among computer engineering students in Pune (India) using Cyberchondria Severity Scale (CSS-15). *Indian J Occup Environ Med* 2019;23:117–20.
- Kanganolli SR, Kumar NP. A cross-sectional study on prevalence of cyberchondria and factors influencing it among undergraduate students. *Int J Med Sci Public Health* 2020;9:263-6.
- Patanapu SK, Sreeja CS, Veeraboina N, Reddy KV, Voruganti S, Anusha P. Prevalence and effect of cyberchondria on academic performance among undergraduate dental students: An institutional based study. *Ind Psychiatry J* 2022;31:228–34.
- Gao L, Su S, Du N, Han Y, Wei J, Cao M, *et al.* Medical and non-medical students' knowledge, attitude and willingness towards the COVID-19 vaccine in China: A cross-sectional online survey. *Hum Vaccines Immunother* 2022;18:2073757.
- Henning MA, Chen J, Krägeloh CU, Hill EM, Booth R, Webster C. A comparative, multi-national analysis of the quality of life and learning factors of medical and non-medical undergraduate students. *Med Sci Educ* 2019;29:475–87.
- Leroy A, Wathélet M, Fovet T, Habran E, Granon B, Martignère N, *et al.* Mental health among medical, healthcare, and other university students during the first COVID-19 lockdown in France. *J Affect Disord Rep* 2021;6:100260.
- McElroy E, Kearney M, Touhey J, Evans J, Cooke Y, Shevlin M. The CSS-12: Development and validation of a short-form version of the cyberchondria severity scale. *Cyberpsychol Behav Soc Netw* 2019;22:330–5.
- Kwon M, Kim D-J, Cho H, Yang S. The smartphone addiction scale: Development and validation of a short version for adolescents. *PLoS One* 2013;8:e83558.
- World Health Organization. Wellbeing Measures in Primary Health Care/ the DepCare Project: Report on a WHO Meeting: Stockholm, Sweden, 12–13 February 1998. World Health Organization. Regional Office for Europe; 1998.
- IBM I. SPSS for Windows (Version 25.0). Chic IL SPSS 2017.
- Sabir S, Naqvi I. Prevalence of cyberchondria among university students: An emerging challenge of the 21st century. *JPMA J Pak Med Assoc* 2023;73:1634–9.
- Makarla S, Gopichandran V, Tondare D. Prevalence and correlates of cyberchondria among professionals working in the information technology sector in Chennai, India: A cross-sectional study. *J Postgrad Med* 2019;65:87–92.
- Srivastava SP, Tiwari SK, Negi M. Prevalence and predictors of cyberchondria and depression amid COVID-19 pandemic in adult population of Uttar Pradesh, India. *Arch Med Health Sci* 2022;10:200–6.
- Kulsum U, Sushma M, Subhaprada SC, Sreedevi A. Prevalence of cyberchondria among undergraduate students of a private degree college with Cyberchondria Severity Scale-12 in an urban area. *BLDE Univ J Health Sci* 2023;8:95-9.
- Kühn L, Bachert P, Hildebrand C, Kunkel J, Reitermayer J, Wäsche H, *et al.* Health literacy among university students: A systematic review of cross-sectional studies. *Front Public Health* 2022;9:680999.
- Afroz N. Internet addiction and subjective well-being of university students. *Indian J Health Wellbeing* 2016;7:787–94.
- Ammati R, Kakunje A, Karkal R, Nafisa D, Kini G, Chandrashekar P. Smartphone addiction among students of medical university in South India: A cross-sectional study. *Ann Int Med Dent Res* 2018;4:1–4.
- Chatterjee S, Kar SK. Smartphone addiction and quality of sleep among Indian medical students. *Psychiatry* 2021;84:182–91.
- Dixit S, Shukla H, Bhagwat A, Bindal A, Goyal A, Zaidi AK, *et al.* A study to evaluate mobile phone dependence among students of a medical college and associated hospital of central India. *Indian J Community Med* 2010;35:339–41.
- Gangadharan N, Borle AL, Basu S. Mobile phone addiction as an emerging behavioral form of addiction among adolescents in India. *Cureus* 2022;14:e23798.
- K R, S G, R U. Prevalence of smartphone addiction in an urban area of Kanchipuram district, Tamil Nadu: A cross sectional study. *Int J Community Med Public Health* 2019;6:4218–23.
- Sharma D, Goel NK, Sidana A, Kaura S, Sehgal M. Prevalence of smartphone addiction and its relation with depression among school-going adolescents. *Indian J Community Health* 2023;35:27–31.
- Li J, Lepp A, Barkley JE. Locus of control and cell phone use: Implications for sleep quality, academic performance, and subjective well-being. *Comput Hum Behav* 2015;52:450–7.
- Venuleo C, Rollo S, Ferrante L, Marino C, Schimmenti A. Being online in the time of COVID-19: Narratives from a sample of young adults and the relationship with well-being. *Mediterr J Clin Psychol* 2022;10:1-25.
- Zhao L. The impact of social media use types and social media addiction on subjective well-being of college students: A comparative analysis of addicted and non-addicted students. *Comput Hum Behav Rep* 2021;4:100122.
- Congman R, Umar M, Bhayo NH, Ijaz MS, Sharifi AF, Akram H. Smartphone addiction and subjective well-being: A case of International students at Northeast Normal University, China. *Am J Creat Educ* 2019;2:70–80.
- Ding Y, Huang H, Zhang Y, Peng Q, Yu J, Lu G, *et al.* Correlations between smartphone addiction and alexithymia, attachment style, and subjective well-being: A meta-analysis. *Front Psychol* 2022;13:971735.
- Koç T, Turan AH. The relationships among social media intensity, smartphone addiction, and subjective wellbeing of Turkish college students. *Appl Res Qual Life* 2021;16:1999–2021.
- Karakaş N, Tekin Ç, Bentli R, Demir E. Cyberchondria, Covid-19 phobia, and well-being: A relational study on teachers. *Med Lav* 2022;113:e2022027.
- Karabeliova S, Ivanova E. Elaborating on Internet addiction and cyberchondria – relationships, direct and mediated effects. *J Educ Cult Soc* 2014;5:127–44.