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Cyberchondria and Medical Skepticism Among Millennials in Pampanga: Toward an Evidence-Informed Prevention Framework

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Abstract

Introduction

The ubiquitous accessibility of the internet shifted digital health-seeking behavior from routine physician consultations to online health-information searching, contributing to the growing prevalence of cyberchondria, a pattern of excessive online searching for health information that aggravates, rather than alleviates, health anxiety. Despite growing empirical data regarding cyberchondria around the world, Southeast Asian provincial studies remain scarce. In this study, we examined the prevalence, severity distribution, and per-construct features of cyberchondria and medical skepticism, and how they are exhibited among millennials in Pampanga, Philippines, as well as the relationship of cyberchondria to specific sociodemographic variables and medical skepticism.

Methods

We conducted a quantitative, descriptive-correlational (analytical), cross-sectional study among 401 millennial residents aged 29 to 44 in Pampanga, Philippines, from November 2025 to March 2026 using purposive and snowball sampling. We collected data via Google Forms (Google LLC, Mountain View, CA, USA) using a three-part questionnaire consisting of a demographic profile survey, the 15-item Cyberchondria Severity Scale (CSS-15), and the three-item Medical Skepticism Scale (MSS). We analyzed the data in jamovi version 2.7 (The jamovi project, Sydney, Australia) using descriptive statistics, independent-samples t-tests, one-way analysis of variance (ANOVA) with Tukey's honestly significant difference (HSD) post-hoc tests, and Pearson correlation. A multidisciplinary panel of nine experts validated our proposed empowerment, awareness, structure, and environment (EASE) cyberchondria prevention framework using the content validity index (CVI).

Results

Statistical analyses from 401 responses revealed that n = 300 (74.8%) of the cohort demonstrated a moderate severity level of cyberchondria (mean = 28.13, SD = 8.69). Excessiveness (mean = 8.01, SD = 2.78) and reassurance-seeking (mean = 7.17, SD = 2.85) constructs were severely affected, followed by distress (mean = 6.15, SD = 3.35) and compulsion (mean = 4.44, SD = 3.05) at moderate levels, while mistrust of medical professionals was remarkably low (mean = 2.36, SD = 2.34). Medical skepticism was generally low to moderate (mean = 4.92, SD = 2.71), highlighting the robust trust of this cohort in conventional medicine. Moreover, females ($t = 3.65$, $p < 0.001$), college-educated and postgraduate degree holders ($F = 7.09$, $p < 0.001$), those with desk-based jobs or whose jobs rely on internet engagement ($F = 5.70$, $p < 0.001$), and those with average daily internet use of 2.1 to 4 hours ($F = 3.17$, $p = 0.024$) reported higher levels of cyberchondria. A statistically significant, weak inverse relationship was found between cyberchondria and medical skepticism ($r = -0.153$, $p = 0.002$). The nine-member expert panel unanimously validated the EASE prevention framework across all 12 items (item-level CVI = 1.00; scale-level CVI = 1.00).

Conclusion

Our findings informed the development of the conceptually validated EASE cyberchondria prevention framework. Anchored to the Cognitive-Behavioral Model of Health Anxiety and the Uncertainty Management Theory, the framework offers structured, evidence-informed approaches to prevent cyberchondria and mitigate its effects by strengthening health literacy, promoting healthy online behaviors, and improving access to timely, professional reassurance within the provincial context.

Categories: Psychiatry, Psychology, Public Health
Keywords: cyberchondria, digital health literacy, ease prevention framework, health anxiety, medical skepticism, millennials, online health information

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Introduction

The widespread availability of the internet provided people with a platform where health-related inquiries can be answered on different websites as soon as a keyword is put in the search bar. While online health information-seeking may be useful for common symptoms managed by simple home remedies, problems arise when people self-diagnose by merely relying on information found online, leading to over-exaggeration of symptoms and heightened health anxiety. Cyberchondria, a term derived from hypochondriasis to characterize the excessive use of the internet to search for medical information, leads to heightened health concerns regarding one's condition, has been associated with health anxiety, and may negatively affect the quality of life [1,2]. A repetitive cycle of health information searching, when not managed properly, results in distress and aggravated anxiety [1,2].

Findings on the prevalence and correlates of cyberchondria vary widely across studies and settings, with inconsistent associations reported with demographics. Crucially, the relationship between digital health anxiety and medical skepticism remains complex; while some literature suggests online searching stems from a distrust of traditional medicine, emerging patterns indicate it may alternatively be driven by anxiety caused by uncertainty when professional medical reassurance is delayed. These discrepancies observed across countries and the limited sample, mostly focused on student respondents rather than active working-class cohorts, highlight the need for context-specific studies [3-5]. The inconsistent association among factors related to cyberchondria calls for studies to solidify findings and address knowledge gaps [5,6], particularly regarding underexplored variables such as average daily internet use, marital status, and occupation.

To measure and understand cyberchondria, McElroy and Shevlin developed the Cyberchondria Severity Scale (CSS), which analyzes cyberchondria across five dimensions: excessiveness, compulsion, distress, reassurance seeking, and mistrust of medical professionals [7]. In relation to health decisions, medical skepticism refers to an individual's tendency to harbor doubt in the ability of conventional medical care to assess, improve, and treat one's health status, operationalized in the Medical Skepticism Scale (MSS), which was originally developed and refined into a three-item scale by Fiscella and colleagues and recently utilized by Claggett and colleagues [8,9]. We anchored this study and our prevention framework to two core theories: the Cognitive-Behavioral Model of Health Anxiety and the Uncertainty Management Theory (UMT). The Cognitive-Behavioral Model of Health Anxiety explains that individuals with heightened anxiety tend to misinterpret bodily sensations as indicators of serious illness, leading them into a loop of reassurance-seeking behavior where online searching provides only a temporary decrease in fear while reinforcing long-term anxiety [10]. Complementing this, Brashers' UMT explains how people cope with health-related uncertainty and posits the importance of communication strategies, such as selective information seeking and social support reliance, in managing uncertainty levels [11].

Little is still known about the prevalence and characteristics of cyberchondria in provincial Philippine settings such as Pampanga, a highly competitive province in Central Luzon with robust digital infrastructure and an economically active, educated millennial population. In this descriptive-correlational, cross-sectional study, we aimed to assess the prevalence and severity distribution of cyberchondria across its five constructs, describe the level of medical skepticism, test whether significant differences exist across demographic characteristics, and examine the relationship between cyberchondria and medical skepticism among sampled millennials in Pampanga. Our findings ultimately informed the development of the conceptually validated empowerment, awareness, structure, and environment (EASE) cyberchondria prevention framework to prevent digital health anxiety and break the cyberchondria cycle.

Materials And Methods

Research design, population, and sampling

In this study, we used a quantitative, descriptive-correlational (analytical), cross-sectional research design to describe the prevalence and severity distribution of cyberchondria in Pampanga, identify associations across demographic variables, and explore medical skepticism at a single point in time. The study population comprised millennials aged 29 to 44 residing in Pampanga during the study period, regardless of their length of stay or place of birth. Based on the 2020 Census data from the Philippine Statistics Authority, the estimated population of Pampanga residents aged 29 to 44 is approximately 605,923. Using Cochran's formula, we set a minimum target of 384 responses. Using purposive sampling and snowball chain referrals, we gathered data from 401 eligible respondents who provided informed consent, exceeding the minimum target.

Instrumentation

We used a three-part, single-form English questionnaire. The first part gathered the sociodemographic profile of the cohort in terms of age, sex, marital status, educational attainment, occupation, and average daily internet usage. The second part adopted the 15-item Cyberchondria Severity Scale (CSS-15) short-form version developed and psychometrically validated via confirmatory factor analysis by Barke and colleagues (historical Cronbach's alpha = 0.89) [12] from the original 33-item scale by McElroy and Shevlin [7]. The CSS-15 encompasses five dimensions with three items each: compulsion (items 3, 4, and 7), distress (items 6, 9,

and 14), excessiveness (items 1, 2, and 13), reassurance seeking (items 8, 10, and 11), and mistrust of medical professionals (items 5, 12, and 15), rated on a five-point Likert scale from 0 (never) to 4 (always), with items 5, 12, and 15 reverse-scored following the CSS-15 protocol [12].

Because the CSS-15 evaluates cyberchondria along a continuum without a universal clinical diagnostic threshold, total scores (ranging from 0 to 60) were categorized into equal-interval descriptive severity tertiles-low (0-19), moderate (20-39), and high (40-60)-adopted from the classification protocols of Dagar and colleagues [13] and Santi et al. [14]. Operationally, a score in the low range (0-19) represents minimal or absent clinically meaningful cyberchondria symptoms, whereas moderate (20-39) and high (40-60) scores denote increasing symptom burden. Similarly, consistent with prior cyberchondria and digital screen-time literature [13,15-17], average daily internet usage in the demographic profile was categorized into four two-hour increments: less than two hours (low use), 2.1 to 4 hours (moderate use), 4.1 to 6 hours (high use), and more than six hours (very high use).

The third part utilized the three-item Medical Skepticism Scale (MSS), derived from the original four-item medical skepticism questionnaire developed by Fiscella and colleagues [9] and refined into the construct-valid three-item scale used by Claggett and colleagues [8]. The three items measured perceived health autonomy (item 1: 'I can overcome most illnesses without help from a medically trained professional'), perception of conventional medicine efficacy (item 2: 'Home remedies are better than medicines prescribed by doctors'), and perceived health expertise (item 3: 'I understand my health better than most physicians do'), rated on a five-point Likert scale from 0 (strongly disagree) to 4 (strongly agree) [8,9], with total scores (0-12) descriptively grouped into low (0-4), moderate (5-8), and high (9-12) skepticism. Because we fully adopted the unaltered English versions of the CSS-15 [12] and three-item MSS [8,9], and given that English is an official language and the primary medium of instruction in the Philippines, where the English CSS-15 has been previously utilized [3], both instruments were administered in their original validated form, preserving their established construct validity and reliability.

Data gathering procedure and statistical treatment

We administered the questionnaire via Google Forms (Google LLC, Mountain View, CA, USA) from the last week of November 2025 to the second week of March 2026 through Facebook, Messenger, and TikTok, alongside snowball referrals. Electronic informed consent was obtained on the mandatory introductory page of the Google Form, which detailed the study objectives, voluntary participation, and data privacy assurances; respondents were required to select an explicit consent tick-box to unlock the survey proper, whereas declining automatically terminated the form. Participation was voluntary and uncompensated, and to ensure strict anonymity, no personal identifiers (such as names, email addresses, or contact numbers) were collected. We analyzed all data using jamovi version 2.7 (The jamovi project, Sydney, Australia). Descriptive statistics included means, standard deviations (SD), frequencies, and percentages. After verifying normality via visual inspection of histograms and quantile-quantile (Q-Q) plots (N = 401), we conducted an independent samples t-test (with Cohen's d effect size) to compare mean cyberchondria scores by sex, one-way analysis of variance (ANOVA, with eta-squared [η^2] effect size and Tukey's honestly significant difference [HSD] post-hoc tests) for multi-group demographic variables, and Pearson correlation (r) to test the relationship between cyberchondria and medical skepticism at $p < 0.05$.

Framework validation and ethical considerations

Our proposed EASE cyberchondria prevention framework was validated by a multidisciplinary panel of nine experts (seven medical doctors across pediatrics, obstetrics and gynecology, primary care, and internal medicine, one Doctor of Clinical Psychology, and one Doctor of Science Education) using a 12-item, five-point Likert scale across four domains: relevance and appropriateness, clarity and logical structure, feasibility and applicability, and comprehensiveness. Following Polit and Beck [18], we dichotomized ratings (scores of 4 and 5 as valid) to compute the item-level content validity index (I-CVI) and average scale-level content validity index (S-CVI/Ave). This research was approved by the Graduate School committee of the University of Perpetual Help System DALTA, and all data were safeguarded confidentially in compliance with the Philippine Data Privacy Act of 2012 (Republic Act No. 10173).

Results

The respondents' demographic profile

Table *1* summarizes the sociodemographic characteristics of the 401 millennial respondents. Younger millennials aged 29 to 32 (n = 136, 33.9%) and 33 to 36 (n = 126, 31.4%) comprised the majority of the sample, and females accounted for n = 249 (62.1%). Slightly over half were married (n = 210, 52.4%), and two-thirds held a college degree (n = 268, 66.8%), with an additional n = 65 (16.2%) holding postgraduate degrees. Daily internet engagement was high, led by respondents using the internet for more than six hours daily (n = 161, 40.1%) and 2.1 to 4 hours daily (n = 117, 29.2%). Occupationally, the largest proportions worked in sales, business, hospitality, and creative industries (n = 114, 28.4%), education, training, law, and research (n = 86, 21.4%), and healthcare, medical, and allied health services (n = 79, 19.7%).

Demographic Variable	Category	Frequency (f)	Percentage (%)
Age	29–32	136	33.9%
	33–36	126	31.4%
	37–40	75	18.7%
	41–44	64	16.0%
Sex	Female	249	62.1%
	Male	152	37.9%
Marital status	Married	210	52.4%
	Single	176	43.9%
	Separated, annulled, or widowed	15	3.7%
Educational attainment	College	268	66.8%
	Basic education (elementary and high school)	68	17.0%
	Postgraduate	65	16.2%
Average daily internet usage	More than 6 hours (very high use)	161	40.1%
	2.1–4 hours (moderate use)	117	29.2%
	4.1–6 hours (high use)	104	25.9%
	Less than 2 hours (low use)	19	4.7%
Occupation	Sales, business, hospitality, and creative industries	114	28.4%
	Education, training, law, and research	86	21.4%
	Healthcare, medical, and allied health services	79	19.7%
	Personal services, transportation, and skilled trades	43	10.7%
	Unemployed or not currently working	40	10.0%
	Engineering, architecture, and information technology	39	9.7%

TABLE 1: Demographic characteristics of the respondents (N = 401)

N = total sample size; f = subgroup frequency.

The prevalence and severity distribution of cyberchondria across constructs

As shown in Table *2*, the majority of the respondents (n = 300, 74.8%) reported moderate severity levels of cyberchondria; n = 67 (16.7%) fell under the low level (indicating minimal or absent clinically meaningful cyberchondria), and n = 34 (8.5%) demonstrated high levels of cyberchondria. The overall mean CSS-15 score of 28.13 (SD = 8.69) closely aligned with the median score of 29, forming a symmetrical bell-curved distribution centered in the moderate severity range (Figure *1*).

Prevalence Level	Frequency (f)	Percentage (%)	Overall Mean ± SD	Interpretation
High (40–60)	34	8.5%		
Moderate (20–39)	300	74.8%	28.13 ± 8.69	Moderate
Low (0–19)	67	16.7%		

TABLE 2: Prevalence and severity distribution of cyberchondria in terms of frequencies, percentages, and mean of total scores (N = 401)

SD = standard deviation; f = frequency. Total Cyberchondria Severity Scale (CSS-15) scores range from 0 to 60, categorized into descriptive severity levels (Low: 0–19, representing minimal/absent clinically meaningful symptoms; Moderate: 20–39; High: 40–60) following Dagar et al. [13] and Santi et al. [14].

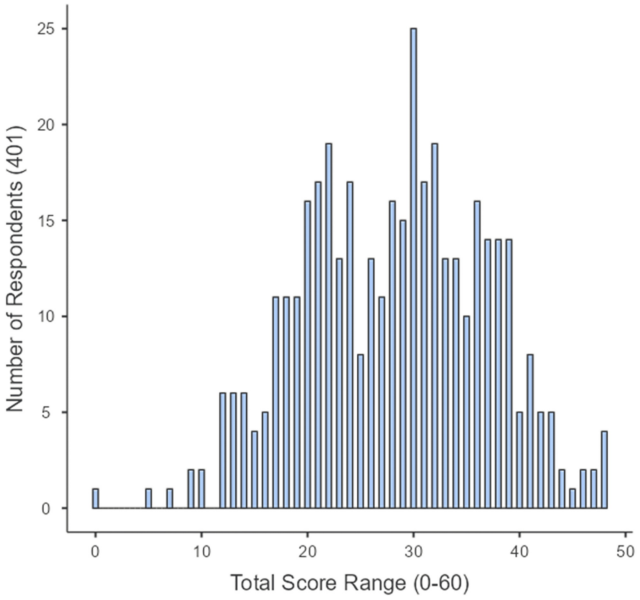


FIGURE 1: Prevalence distribution of cyberchondria among millennials

Total 15-item Cyberchondria Severity Scale (CSS-15) scores range from 0 to 60 across the 401 respondents (mean = 28.13, SD = 8.69, median = 29.00).

Table *3* details the per-indicator analysis of the CSS-15, and Table *4* summarizes the construct-level severity distributions. Across constructs, excessiveness (mean = 8.01, SD = 2.78; n = 282, 70.3% severely affected) and reassurance seeking (mean = 7.17, SD = 2.85; n = 236, 58.9% severely affected) were severely affected, with respondents often searching for unexplained bodily symptoms (mean = 2.76), visiting forums and trustworthy sites (mean = 2.65), and finding comfort when discussing symptoms with their doctor (mean = 2.64). Distress (mean = 6.15, SD = 3.35) and compulsion (mean = 4.44, SD = 3.05) were moderately affected, indicating that while online searching sometimes triggers anxiety (mean = 2.31) and panic (mean = 2.12), it rarely disrupts online leisure (mean = 1.49) or computer work (mean = 1.22). Conversely, reverse-scored indicators in the mistrust construct yielded the lowest means (construct mean = 2.36, SD = 2.34; only n = 23, 5.7% severely affected), showing that respondents place much greater trust in a doctor's diagnosis than in online self-diagnosis (mean = 0.63).

Construct	Indicator	Mean ± SD	Verbal Interpretation
Excessiveness	1. Search unexplained bodily symptoms	2.76 ± 1.10	Often
Excessiveness	2. Looking for same symptoms repeatedly	2.60 ± 1.14	Often
Compulsion	3. Search disturbs other online work	1.73 ± 1.23	Sometimes
Compulsion	4. Search disrupts online leisure	1.49 ± 1.14	Rarely
Mistrust*	5. Doctor > Online research*	0.71 ± 0.95	Never
Distress	6. Panics about serious illness	2.12 ± 1.27	Sometimes
Compulsion	7. Search disturbs other activities	1.22 ± 1.12	Rarely
Reassurance	8. Discuss findings with doctor	2.22 ± 1.35	Sometimes
Distress	9. Anxious/distressed after research	2.31 ± 1.28	Sometimes
Reassurance	10. Research leads to consulting professionals	2.31 ± 1.07	Sometimes
Reassurance	11. Discussing symptoms adds comfort	2.64 ± 1.12	Often
Mistrust*	12. Trust Dr. more than online*	0.63 ± 0.90	Never
Excessiveness	13. Visit forums and trustworthy sites	2.65 ± 1.21	Often
Distress	14. Difficulty falling asleep after searching	1.72 ± 1.19	Sometimes
Mistrust*	15. Trust Dr. even if concerns dismissed*	1.02 ± 1.04	Rarely

TABLE 3: Per-indicator analysis of the 15-Item CSS-15 (N = 401)

CSS-15 = 15-item Cyberchondria Severity Scale; SD = standard deviation; Dr. = doctor. Verbal interpretation scale: 0.00–0.80 = Never; 0.81–1.60 = Rarely; 1.61–2.40 = Sometimes; 2.41–3.20 = Often; 3.21–4.00 = Always. *Reverse-scored item.

Construct	Not Affected (Score 0) f (%)	Moderately Affected (Score 1–6) f (%)	Severely Affected (Score 7–12) f (%)	Mean ± SD	Interpretation
1. Excessiveness	4 (1.0%)	115 (28.7%)	282 (70.3%)	8.01 ± 2.78	Severely affected
2. Compulsion	64 (16.0%)	239 (59.6%)	98 (24.4%)	4.44 ± 3.05	Moderately affected
3. Distress	19 (4.7%)	198 (49.4%)	184 (45.9%)	6.15 ± 3.35	Moderately affected
4. Reassurance	9 (2.2%)	156 (38.9%)	236 (58.9%)	7.17 ± 2.85	Severely affected
5. Mistrust	97 (24.2%)	281 (70.1%)	23 (5.7%)	2.36 ± 2.34	Moderately affected

TABLE 4: Levels of cyberchondria in terms of severity of constructs (N = 401)

f = frequency; SD = standard deviation. Construct scale interpretation: 0 = Not affected; 1–6 = Moderately affected; 7–12 = Severely affected.

Medical skepticism among millennials in Pampanga

Tables 5, 6 present the per-indicator and overall severity metrics for the MSS. Respondents generally disagreed that home remedies are better than doctor-prescribed medicines (mean = 1.53, SD = 1.03), disagreed that they understand their health better than most physicians do (mean = 1.57, SD = 1.15), and showed low-to-moderate endorsement of overcoming most illnesses without professional medical help (mean = 1.82, SD = 1.22). Overall, respondents largely exhibited low (n = 173, 43.1%) to moderate (n = 188,

46.9%) medical skepticism (overall mean = 4.92, SD = 2.71, median = 5.00), with only n = 40 (10.0%) scoring high, as reflected in the normal distribution in Figure 2.

Construct	Indicator	Mean ± SD
Perceived health autonomy	I can overcome most illnesses without help from a medically trained professional.	1.82 ± 1.22
Perception of conventional medicine efficacy	Home remedies are better than medicines prescribed by doctors.	1.53 ± 1.03
Perceived health expertise	I understand my health better than most physicians do.	1.57 ± 1.15

TABLE 5: Per-indicator analysis under the medical skepticism scale (N = 401)

SD = standard deviation. Items were rated on a five-point Likert scale ranging from 0 (strongly disagree) to 4 (strongly agree).

Construct	Low (0–4) f (%)	Moderate (5–8) f (%)	High (9–12) f (%)	Mean ± SD	Interpretation
Medical skepticism	173 (43.1%)	188 (46.9%)	40 (10.0%)	4.92 ± 2.71	Moderate

TABLE 6: Medical skepticism severity metrics (N = 401)

f = frequency; SD = standard deviation. Total score scale: 0–4 = Low; 5–8 = Moderate; 9–12 = High.

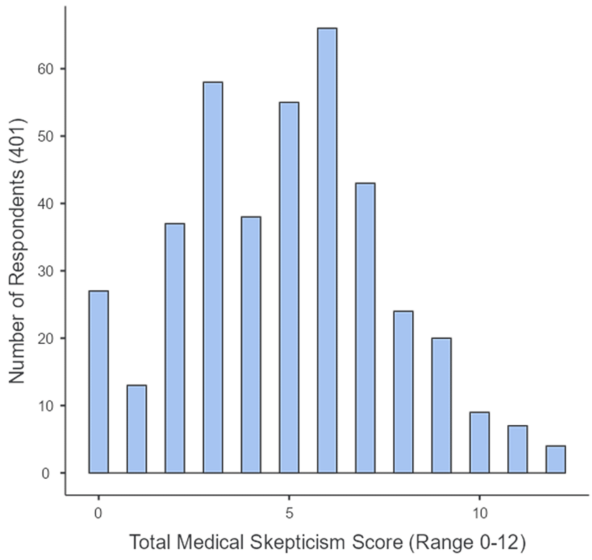


FIGURE 2: Distribution of medical skepticism scores

Total Medical Skepticism Scale (MSS) scores range from 0 to 12 across the 401 respondents (mean = 4.92, SD = 2.71, median = 5.00).

Significant differences between demographics and cyberchondria

Tables 7, 8 present the omnibus inferential tests and Tukey HSD post-hoc comparisons across demographic profiles. Females reported significantly higher cyberchondria scores than males (t = 3.65, p < 0.001, Cohen's

d = 0.376, small-to-medium effect). Significant differences also emerged across educational attainment (F = 7.09, p < 0.001, η^2 = 0.034), occupation (F = 5.70, p < 0.001, η^2 = 0.067, medium effect), and average daily internet use (F = 3.17, p = 0.024, η^2 = 0.023), whereas marital status (F = 1.453, p = 0.235) and age (F = 0.755, p = 0.520) were not significant. Post-hoc tests (Table 8) confirmed that respondents with basic education scored significantly lower than both college (p = 0.002) and postgraduate (p = 0.003) degree holders; manual and skilled trade workers scored significantly lower than professionals in education, law, and research (p < 0.001) and sales, business, and media (p < 0.001); and low internet users (less than two hours daily) scored significantly lower than moderate users (2.1 to 4 hours daily, p = 0.016), with no further significant increases at higher screen-time brackets.

Demographic Variable	t / F Value	p-value	Decision	Cohen's d / Eta-Squared (η^2)	Effect Interpretation
Sex	t = 3.65	< 0.001*	Significant	d = 0.376	Small to medium
Educational attainment	F = 7.09	< 0.001*	Significant	η^2 = 0.034	Small
Occupation	F = 5.70	< 0.001*	Significant	η^2 = 0.067	Medium
Average internet use	F = 3.17	0.024*	Significant	η^2 = 0.023	Small
Marital status	F = 1.453	0.235	Not significant	η^2 = 0.007	Negligible
Age	F = 0.755	0.520	Not significant	η^2 = 0.006	Negligible

TABLE 7: Test of difference and association between demographic profiles and cyberchondria (N = 401)

t = independent samples t-test statistic; F = one-way analysis of variance F-value; d = Cohen's d effect size (thresholds: 0.20, 0.50, 0.80); η^2 = eta-squared effect size (thresholds: 0.01, 0.06, 0.14). *Significant at the p < 0.05 level.

Variable	Group I	Group J	Mean Difference (I - J)	p-value	Decision
Education	Basic education	College	-4.010	0.002*	Significant
Education	Basic education	Postgraduate	-4.953	0.003*	Significant
Education	College	Postgraduate	-0.943	0.705	Not significant
Daily internet use	Low (< 2 hours)	Moderate (2.1–4 hours)	-6.349	0.016*	Significant
Daily internet use	Low (< 2 hours)	High (4.1–6 hours)	-5.197	0.076	Not significant
Daily internet use	Moderate (2.1–4 hours)	High (4.1–6 hours)	1.152	0.755	Not significant
Occupation	Skilled trades and maintenance	Education, law, and research	-7.163	< 0.001*	Significant
Occupation	Skilled trades and maintenance	Sales, business, and media	-6.618	< 0.001*	Significant
Occupation	Education, law, and research	Sales, business, and media	0.545	0.998	Not significant

TABLE 8: Tukey HSD post-hoc test results for education, daily internet use, and occupation (N = 401)

HSD = honestly significant difference. *Significant at the p < 0.05 level.

Relationship between cyberchondria and medical skepticism

As shown in Table 9, Pearson correlation analysis revealed a statistically significant, weak negative relationship between cyberchondria and medical skepticism (r = -0.153, p = 0.002). The downward regression line in Figure 3 illustrates that respondents with lower medical skepticism scores (higher trust in physicians) tended to report higher cyberchondria severity.

Variables	Mean ± SD	Pearson r	p-value	Interpretation
Cyberchondria	28.13 ± 8.69	-0.153	0.002*	Significant negative (weak)
Medical skepticism	4.92 ± 2.71			

TABLE 9: Pearson correlation between cyberchondria and medical skepticism (N = 401)

SD = standard deviation; r = Pearson correlation coefficient (thresholds: 0.10, 0.30, 0.50). *Correlation is significant at the p < 0.01 level.

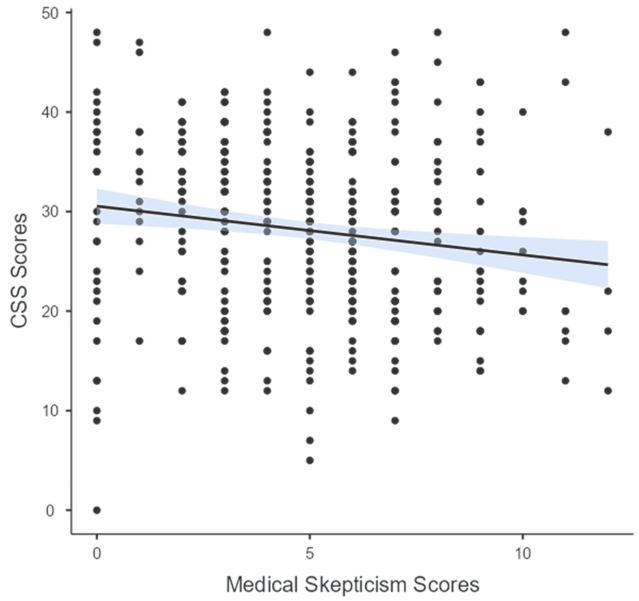


FIGURE 3: Scatter plot of the relationship between cyberchondria and medical skepticism

CSS: Cyberchondria Severity Scale. Solid black line represents the linear regression line with 95% confidence band across N = 401 respondents (r = -0.153, p = 0.002).

Validation of the proposed EASE cyberchondria prevention framework

Formal content validation of the EASE cyberchondria prevention framework by the nine-member multidisciplinary panel of experts yielded a perfect item-level content validity index (I-CVI) of 1.00 across all 12 items, indicating unanimous agreement among the validators, and a scale-level content validity index (S-CVI/Ave) of 1.00. Across the four evaluation domains, the framework garnered high mean ratings out of 5.00 for relevance and appropriateness (mean = 4.78), clarity and logical structure (mean = 4.74), feasibility and applicability (mean = 4.67), and comprehensiveness (mean = 4.74), with an overall composite mean score of 4.73. Figure *4* presents the validated EASE cyberchondria prevention framework, and Table *10* summarizes the proposed evidence-based interventions organized according to its four components.

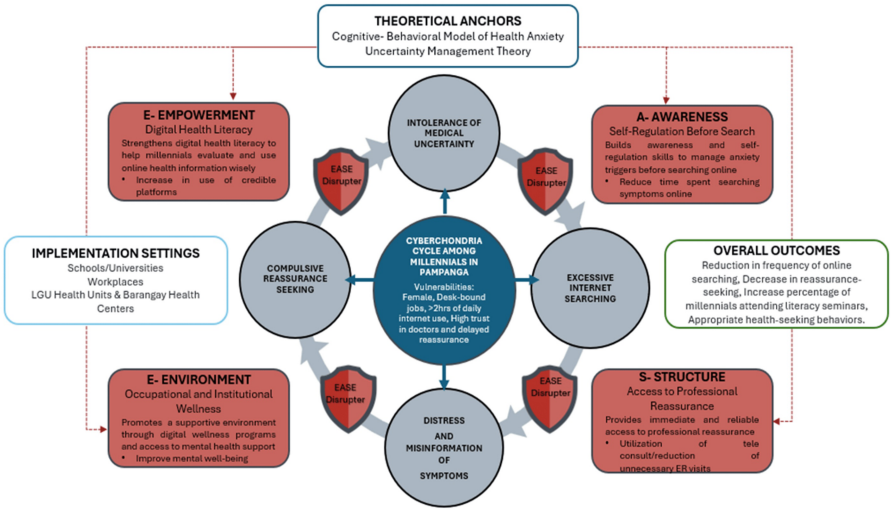


FIGURE 4: The EASE cyberchondria prevention framework

EASE: Empowerment, Awareness, Structure, and Environment; LGU: local government unit; ER: emergency room. This figure was originally created by the authors using Microsoft PowerPoint 2024 (Microsoft Corporation, Redmond, WA, USA).

Framework Component	Core Objective	Proposed Interventions
Empowerment	To strengthen the ability to interpret and manage minor symptoms, thereby reducing uncertainty-driven online searching.	Barangay-level 'Basic Symptom Triage' sessions; dissemination of short, evidence-based informative handouts; LGU-approved 'First 24 Hours Guide' for symptom management; free health literacy workshops in partnership with local universities.
Awareness	To address and regulate digital behaviors that intensify cyberchondria, particularly among those exceeding two hours of daily internet use.	LGU-led social media campaigns on digital hygiene; informational posters in workplaces and schools; HR-integrated digital hygiene workshops; engagement of local influencers and health vloggers to promote mindful searching.
Structure	To provide immediate structural access to credible professional reassurance, addressing the delay that heightens anxiety.	Barangay tele-consult hours with RHU nurses or municipal doctors; chat-based HMO support for employed individuals; clinic-based 'Ask-a-Nurse' triage desks; low-cost teleconsultation services through local clinics.
Environment	To mitigate occupational factors and reduce digital fatigue among high-risk groups engaged in computer and internet use.	Mandated screen breaks in the workplace; HR-led discussions on digital wellness modules; installation of quiet wellness corners for employee breaks; community-based mental health support via trained barangay health workers; LGU partnerships with local wellness centers to offer discounted programs and promos for well-being.

TABLE 10: Summary of interventions of the EASE cyberchondria prevention framework

EASE = Empowerment, Awareness, Structure, and Environment; LGU = local government unit; HR = human resources; RHU = rural health unit; HMO = health maintenance organization.

Discussion

The high proportion of respondents within the moderate cyberchondria severity category (74.8%) among our sampled millennials in Pampanga-while interpreted cautiously given our online non-probability sampling-corroborates the findings of a previous local study among Filipino teacher education students [3] and parallels international cross-sectional studies documenting moderate cyberchondria scores across varied adult and student populations in Egypt, South Asia, Nigeria, Poland, and India [15,16,19-22]. However, this contrasts with several prior empirical studies that reported high prevalence rates across different age and student cohorts [5,23-25], as well as an Indonesian study that reported low baseline prevalence among first-year medical students [26]. Across constructs, millennials in Pampanga experience cyberchondria primarily through severe excessiveness and reassurance-seeking, with moderate distress, controlled compulsion, and minimal mistrust of medical professionals. These results mirror prior investigations that found excessiveness and reassurance-seeking to be severely affected alongside low mistrust [13,26], and align with observations identifying excessiveness as the most prevalent construct and mistrust as the least affected among medical students [14]. Collectively, our per-item and construct analyses echo empirical observations confirming that online health-seeking behaviors frequently coexist with high trust in professional clinical advice [21,26].

In terms of medical skepticism, the low to moderate scores across all three MSS constructs show that respondents generally trust medical professionals and conventional medicine over self-diagnosis or home remedies, aligning with the operationalization of medical skepticism measuring attitudes toward physician diagnosis and treatment efficacy [8,9]. Crucially, the statistically significant yet weak negative relationship between cyberchondria and medical skepticism ($r = -0.153$, $p = 0.002$) indicates that as medical skepticism decreases, cyberchondria scores modestly tend to increase. While the weak magnitude of this association warrants cautious interpretation, this pattern suggests that cyberchondria in this cohort may not primarily stem from distrust of doctors, but could instead be linked to a strong reliance on medical professionals [21,26]. A plausible explanation, consistent with prior literature, is that when trusting individuals experience symptoms without immediate access to a healthcare provider, uncertainty becomes difficult to manage, potentially prompting them to search the internet for reassurance. This interpretation aligns conceptually with the Cognitive-Behavioral Model of Health Anxiety [10] and empirical evidence establishing intolerance of uncertainty and anxiety sensitivity as prospective risk factors for cyberchondria [27]. Repeated online searching intended to reduce health uncertainty may backfire and amplify anxiety, keeping individuals stuck in the cyberchondria loop. As noted in recent studies, how health information is processed and interpreted significantly shapes distress levels and health decisions [5,28], which may help explain why reassurance-seeking and excessiveness emerged as severely affected constructs in our study despite a weak overall correlation effect size.

Regarding demographic differences, females exhibited significantly higher cyberchondria scores than males, a finding consistent with prior empirical studies [3-5,15,16,29] that may reflect greater engagement in symptom monitoring and online health information-seeking among women, although these specific behavioral mechanisms were not directly measured in the present study. For educational attainment, cyberchondria scores increased significantly once individuals reached college and postgraduate education. This aligns with prior research suggesting that familiarity with complex medical terminologies may lead to binge online searches [14]. Rather than preventing cyberchondria, advanced education may plausibly expose individuals to complex or alarming medical literature that heightens vulnerability to anxiety-provoking searches, a paradox similarly documented in previous international studies [19,22,25,30].

Occupational status emerged as one of the most notable demographic factors associated with cyberchondria, showing the highest effect size among all demographic variables ($\eta^2 = 0.067$). Manual and field-based workers had significantly lower cyberchondria scores than professionals in desk-based and information-heavy roles (education, law, research, sales, business, and media), directly mirroring studies that reported higher CSS scores and excessiveness among computer-engaged and information technology workers compared to skilled trade workers [15-17]. Meanwhile, healthcare and allied health workers stood near the middle of the score distribution; previous literature suggests that while their medical literacy may help them interpret symptoms more accurately, fast-paced clinical environments and digital engagement could still predispose them to online health anxiety [14,20]. Average daily internet use further highlighted a notable difference between low use (less than two hours daily) and moderate use (2.1 to 4 hours daily), aligning with daily internet exposure patterns identified in prior literature [13,15-17]. One possible interpretation is that screen time beyond four hours may shift toward passive entertainment or routine job tasks without further increasing CSS-15 scores; thus, preventive strategies may benefit from targeting mindful search habits early, particularly as daily internet use surpasses two hours. Conversely, the absence of a significant age effect contrasts with studies comparing across broader generational cohorts [13,15,17,23-25] because our sample was restricted to a homogeneous millennial age band (29 to 44 years), and marital status likewise showed no significant differences, contrasting with studies that reported higher scores among single individuals [15,21,25].

Design and components of the EASE cyberchondria prevention framework

Because trust in physicians is already high among millennials in Pampanga, interventions must focus on

managing the anxiety that occurs when trusted doctors are out of reach. Unanimously validated by the nine-member multidisciplinary panel with an I-CVI of 1.00 and an S-CVI/Ave of 1.00 (meeting the gold standard criteria of Polit and Beck [18]), the EASE framework maps a cycle-intervention design anchored to the Cognitive-Behavioral Model of Health Anxiety [10] and Uncertainty Management Theory [11], alongside Starcevic's practical guidance on cyberchondria prevention [1]. To interrupt the four-stage cyberchondria loop (intolerance of medical uncertainty, excessive internet searching, distress and misinformation of symptoms, and compulsive reassurance seeking), four EASE disrupter shields are positioned along the cycle.

Empowerment

The Empowerment component strengthens millennials' ability to interpret and manage minor symptoms through barangay-level 'Basic Symptom Triage' sessions, short evidence-based handouts, a local government unit (LGU)-approved 'First 24 Hours Guide,' and university-partnered health literacy workshops, reflecting Starcevic's recommendation to improve online health literacy and correct unrealistic expectations about the diagnostic value of internet searches [1].

Awareness

The Awareness component regulates digital behaviors during the critical first two hours of daily internet exposure through LGU-led social media campaigns, workplace and school posters, human resource digital hygiene workshops, and local health vloggers promoting mindful searching, putting to work Starcevic's emphasis on managing information overload and limiting online symptom searches [1].

Structure

The Structure component addresses severe reassurance-seeking and excessiveness by expanding timely clinical reassurance through barangay teleconsult hours with rural health unit (RHU) nurses or municipal doctors, health maintenance organization (HMO) chat support, clinic-based 'Ask-a-Nurse' desks, and low-cost local teleconsultation services, aligning with Starcevic [1] and Uncertainty Management Theory [11].

Environment

The Environment component addresses occupational triggers among computer-engaged workers [15,17] through mandated workplace screen breaks, human resource digital wellness modules, quiet wellness corners, trained barangay mental health workers, and LGU partnerships with wellness centers to mitigate problematic internet use patterns and environmental stressors [1].

Study limitations and recommendations

While this study benefits from an adequately powered provincial sample and unanimous multidisciplinary expert validation, its findings should be interpreted within the context of several limitations. First, the use of online purposive and snowball sampling may introduce selection bias toward digitally active respondents, limiting the generalizability of the reported cyberchondria severity proportions to the broader millennial population in Pampanga. Second, the cross-sectional and self-reported nature of the survey precludes causal inferences, and proposed explanatory mechanisms-such as healthcare access delays, uncertainty intolerance, and specific online browsing habits-were not directly measured and should be viewed as plausible theoretical interpretations rather than established causal pathways. Additionally, because the scope of this phase centered on the empirical development and content validation of the EASE prevention framework, longitudinal clinical testing was reserved for subsequent implementation trials.

In light of our findings, clinicians should approach patients presenting with internet-derived self-diagnoses empathetically-recognizing that their behavior may stem from a need for immediate reassurance rather than medical mistrust-and provide curated lists of reliable health websites. Mental health practitioners should integrate intolerance of uncertainty and cognitive-behavioral digital hygiene strategies into psychological assessments. Public health agencies, local government units, employers, and universities should collaborate to expand community teleconsultation channels, implement workplace digital wellness policies, and embed critical digital health literacy into academic curricula to help individuals emotionally distance themselves from unverified medical literature. Finally, building on this baseline provincial data, future researchers should (1) examine the prevalence and severity distribution of cyberchondria across both micro- and macro-level communities in other regions using probability sampling, (2) explore additional sociodemographic and clinical variables such as frequency of hospital visits, monthly income, and number of children, (3) compare digital health anxiety across different generational cohorts such as Generation Z and Baby Boomers, (4) assess the direct impact of cyberchondria on overall quality of life, and (5) evaluate the real-world clinical effectiveness of the EASE prevention framework through longitudinal empirical trials.

Conclusions

Moderate cyberchondria severity was observed in the majority of our sampled millennials in Pampanga, with excessiveness and reassurance-seeking severely affected and mistrust of medical professionals remarkably low. Unlike traditional hypochondriasis, where patients often distrust conventional medicine, our findings suggest that cyberchondria in this cohort coexists with high physician trust and may be associated with a strong need for clinical reassurance.

The statistically significant yet weak inverse relationship between medical skepticism and cyberchondria suggests that online health searching does not necessarily stem from medical distrust, but may plausibly occur when trusting individuals seek immediate reassurance to manage health uncertainty. Moreover, female sex, college and postgraduate educational attainment, desk-bound and digitally engaged occupations, and daily internet activity exceeding two hours emerged as significant factors associated with higher cyberchondria scores, pointing to the transition beyond two hours of daily internet use as a practical window for digital hygiene interventions. Traditional advice simply telling individuals to stop searching online is insufficient against health anxiety. Integrating the conceptually validated EASE prevention framework offers a structured, community-based approach to address the educational, behavioral, structural, and occupational correlates of cyberchondria in a provincial setting. Future longitudinal and multi-cohort studies utilizing probability sampling and directly assessing healthcare accessibility and quality-of-life variables are warranted to empirically test the real-world effectiveness of the EASE framework across diverse populations.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Jeremiah R. Nepomuceno, Viernalyn M. Nama

Acquisition, analysis, or interpretation of data: Jeremiah R. Nepomuceno

Drafting of the manuscript: Jeremiah R. Nepomuceno

Critical review of the manuscript for important intellectual content: Jeremiah R. Nepomuceno, Viernalyn M. Nama

Supervision: Jeremiah R. Nepomuceno, Viernalyn M. Nama

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. Graduate School Research Review Panel, University of Perpetual Help System DALTA issued approval n/a. The study protocol, methodology, and ethical safeguards were critically reviewed and formally approved by the five-member Graduate School Dissertation Panel of PhD examiners, chaired by Dr. Mona Liza N. Valencia, together with Research Adviser Dr. Viernalyn M. Nama, at the University of Perpetual Help System DALTA. Because this study was an observational, anonymous online survey of consenting adult volunteers involving no medical procedures or clinical interventions, the doctoral panel determined that the research posed minimal risk and authorized data collection under institutional academic research guidelines without requiring a separate hospital clinical trial review. Written electronic informed consent was obtained from all participants prior to beginning the survey. The signed Graduate School panel endorsement document is uploaded for editorial review. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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content.

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