ORIGINAL ARTICLE

Received: Mai 16, 2023

Revised: Nov 28, 2023

Approved: Jan 11, 2024

Cyberchondria and quality of life: a cross-sectional study in Brazilian individuals

Jaqueline Alves Zwierzikowski[1], Beatriz Pyrich Cavalheiro[2], Luis Felipe Ingles Takada[3], Gabriela de Souza Rusch[3], Mateus Latronico Baena[3], Renato Nisihara[3], Thelma Larocca Skare[3]

[1]Departamento de Medicina, Universidade Federal do Paraná (UFPR) – Curitiba (PR), Brazil

[2]Departamento de Medicina, Faculdades Pequeno Principe (FPP) – Curitiba (PR), Brazil

[3]Faculdade Evangélica de Medicina Mackenzie Paraná (FEMPAR) – Curitiba (PR), Brazil

Corresponding author: Renato Nisihara - Faculdade Evangélica Mackenzie do Paraná - Rua Padre Anchieta, 2770 - Bigorrilho – CEP: 80730-000 – Curitiba (PR), Brazil – E-mail: renatonisihara@gmail.com

Declaration of interest: nothing to declare

https://doi.org/10.7322/abcshs.2023059.2320

ABSTRACT

Introduction: Cyberchondria is a newly described entity in which patients recurrently search health information on the internet developing distress and suffering with the obtained information. **Objective:** To study cyberchondria in a sample of the Brazilian population: its association with epidemiological variables and interference with quality of life. **Methods:** This is a cross-sectional observational study, with 948 participants. Three questionnaires were applied through the internet: one epidemiological; the Cyberchondria Severity Scale (CSS) questionnaire and the SF-12 (12-Item Short-Form Health Survey) quality of life (QoL) questionnaire. **Results:** CSS was weakly and negatively correlated with the age of participants in the subscale "compulsion" ($r=-0.08$, $p=0.01$) and "distress" ($r=-0.12$, $p<0.0001$). Men had higher scores on "compulsion" ($p=0.02$). A weak and negative correlation was found between the subscales of "compulsion," "distress," "excessiveness" and "reassurance seeking" of CSS and SF-12-physical domains and the subscales of "compulsion" and "distress" with SF-12 mental domain. An independent relationship was found between the male sex ($p=0.009$), living in rural areas ($p=0.002$), having less than 10 years of formal education ($p<0.0001$), and earning less than 5 minimal wages/month ($p=0.0002$) with the subscale "mistrust of medical professional". **Conclusion:** Males and younger individuals have higher levels of compulsion in the CSS than females and the elderly. Mistrust of medical professionals was less common in females, in those living in urban areas, and in those with better education and higher income. Cyberchondria interferes with mental and physical QoL.

Keywords: Anxiety Disorders; patient portals; Quality of Life; Public Health.

INTRODUCTION

The widespread use of the internet has allowed the dissemination of knowledge, and this instrument has become a useful and important research tool[1]. The role of the internet on health has been more evident in two situations: the first is promoting access to medical information to the public; the second, associated with the first, is noted when individuals with high levels of health distress go online frequently and for long periods of time[2].

Searching for medical information on the internet is easy; the results are obtained quickly; the process is anonymous and overcomes administrative barriers. One can ask almost any question without feeling embarrassed. It is also cheap or costs nothing. The acquired knowledge helps break down difficulties in patient-doctor communication, allowing the patient to have a more active participation in the discussion about diagnosis, care, and treatment. However, excessive use of this tool in susceptible individuals may cause distress. Indeed, Starcevic et al.[3] have reported that the use of the Internet for health purposes increases distress in many users and is associated with increased symptoms of depression.

Cyberchondria is a recently described condition defined as the excessive search for health information on the Internet, motivated by distress and the consequent need to obtain guarantees[3]. Nevertheless, it may lead to unfounded escalation of concerns about common symptomatology based on research results and online readings[1]. It has been noted that people who search for health-related information on the internet are more likely to choose results that are more impressive or even frightening[3]. Likewise, algorithms used by search engines may expose the user to uncommon diseases[4]. White et al.[5] observed that in the search for health information, there are high rates of association of rare diseases, such as brain tumors, with common symptoms, such as a simple headache.

https://doi.org/10.7322/abcshs.2023059.2320

The literature still tries to draw a profile of people who seek medical information online. However, there is no consensus. While some studies claim that less educated people are the majority[6], others show that being more educated is related to a greater demand for information. Some of them indicate that women research more than men[1,7].

Knowing the profile of internet users for health problems is a valuable tool to approach cyberchondria[8,9]. This profile may suffer the influence of socio-economic and cultural factors and should be studied considering the society where the internet user is inserted. Herein we studied a sample of Brazilian individuals aiming to know the characteristics of those affected by cyberchondria and its influence on quality of life.

METHODS

This is a cross-sectional study approved by the local Committee of Ethics in Research CAAE 11668919.1.0000.01031 under protocol 3,308,378 and conducted through the Internet with a sample of 948 participants. The online consent form consisted of a page that preceded the questions. Thus, the participants only had access to the questionnaires after clicking on the agreement and reading a term that assured their autonomy and the study's confidentiality.

The recruitment was done through social networks, using the algorithm of Facebook ADS; the platform used was Google Forms. The collection period went from April 2020 to June 2020. The research was directed at individuals aged 18 years or older, of both sexes and without exclusion of races. There were no exclusion criteria.

The survey had three sets of questions: (a) one of epidemiological character (age, sex, number of years of formal study, ethnic background, living in urban or rural area, use of tobacco or alcohol, presence of chronic disorders); (b) the Cyberchondria Severity Scale - a questionnaire developed by McElro and Shevlin[10,11] and (c) SF-12 questionnaire

https://doi.org/10.7322/abcshs.2023059.2320

(or 12-Item Short-Form Health Survey) to assess quality of life (QoL)[12,13]. Cyberchondria Severity scale and the SF-12 have been translated and validated into the Portuguese-Brazilian language[12,14].

The Cyberchondria Severity Scale (CSS) considers the following subitems: "compulsion," "distress," "excessiveness," "seeking reassurance" and "mistrust in health professionals." It has 33 statements that participants should evaluate and answer according to their own experience, using five items on a Likert scale: never, rarely, sometimes, always, and frequently. The subscales of "compulsion," "excessiveness" and "distress" have a maximum score of 32 points; in the item "reassurance seeking" the maximum value is 24; in the subscale "mistrust of medical professional", the maximum value is 12. It does not have a cutting-off point to establish a diagnosis, but higher values indicate more tendency to develop cyberchondria. The subscale of "mistrust of medical professional" is the only subscale in which the score varies in the opposite direction of the others, that is, the highest value means less distrust. So, in the present work - this subscale was studied separately[10,11].

The SF-12 is a multidimensional QoL measurement instrument composed of 12 questions that assess the mental and physical domains of health. It presents a final score from 0 to 100, in which zero corresponds to the worst general health status and 100 to the best health status[12,13].

The data were collected into frequency and contingency tables. The sample distribution was studied by the Shapiro-Wilk test and the measures of central tendency were expressed in means and standard deviation (SD) if the data was parametric and median and interquartile intervals (IQR) if not parametric. The correlation of QoL measurements with the cyberchondria domains and with total general and age was made by Spearman's test. The comparison of degrees of cyberchondria according to sex, place

https://doi.org/10.7322/abcshs.2023059.2320

of residence, and presence of chronic disease was made by Mann Whitney test. The level of education and income and use of alcohol and tobacco were done using the Kruskall-Wallis test. Epidemiological data correlated with distrust in the physician with $p<0.1$ were analyzed by multiple linear regression for the variables' independence test. The calculations were made with the help of MedCalc Software version 19.4.1 (MedCalc Software Ltd, Ostend, Belgium; https://www.medcalc.org). The significance adopted was 5%.

RESULTS

Table 1 describes the studied population showing that most responders were females, living in urban areas, of Afro-descendant origin, and not exposed to alcohol or tobacco. Most of the participants have more than 10 years of formal education.

Study of subscales of "compulsion," "distress," "excessiveness" and "seeking for reassurance" of Cyberchondria severity scale

In this sample the median value for compulsion was 7 (IQR=1-13); the median value for distress was 8 (IQR=3-16) and for excessiveness was 13 (IQR=7-20), remembering that these subscales range from 0 - 32. The median value of reassurance seeking was 9 (IQR= 4-14) which is a subscale that ranges from 0-24.

Females when compared with males showed higher values of compulsion ($p=0.02$) but no differences in distress, excessiveness, and reassurance seeking ($p>0.05$). Ethnic background, income, years of formal study, smoking, living in urban or rural areas, and having chronic disease did not influence any of these subscales. Alcohol use is associated with higher values in compulsion ($p=0.04$). Age showed a weak negative correlation with compulsion (rho=-0.08; 95%CI -0.14 to -0.01; $p=0.01$) and distress

https://doi.org/10.7322/abcshs.2023059.2320

(rho=-0.12; 95%CI -0.12—0.06; p<0.0001). The study of quality of life according to the values of studied subscales is in Table 2.

Study of "mistrust of medical professional" scale

This scale, which ranges from 0-12, is the only subscale in the CSS instrument in which higher values mean better outcomes or higher values mean trusting more in the doctor. In the whole sample, its median value was 9 (IQR=6-12).

The association studies of this scale showed that females had higher values than males (median values of 9 versus 8 points with p=0.009), individuals living in the urban area had higher trust in doctors than those living in a rural area (median value of 9 versus 8 points; p=0.0005); Afro-descendants trusted better doctors than Caucasians (median value of 10 versus 9 points; p=0.001). Having lower income was associated with lower trust in physicians (<3 minimal wages with a median value of 9, between 4 and 5 with a median value of 10, and more than 5 with a median value of 10 points; p<0.0001 with differences in the group of less than 3 minimal wages with the two others). Having more years of study increased trust in the doctor (>10 years with a median value of 9 versus a median value of 8 points in both: those studying 5-10 years and less than 5 years; p=<0.0001). Smoking, use of alcohol, and having chronic disease were not associated with mistrust of medical professionals. Age also did not correlate with mistrust of the doctor (p>0.05).

A multiple regression study having "mistrust of medical professional" scale as the dependent variable and sex, ethnic background, income, years of formal study and living in urban or rural areas showed that male sex (β=-0.5; t=-2.92; p=0.003), lower income (β=0.44;t=3.68; p=0.0002), fewer years of study (β=0.37; t=4.20; p<0.0001), living in

https://doi.org/10.7322/abcshs.2023059.2320

rural area (β=-0.98; t=-3.03; p=0.002) but not ethnic background had independent association with not trusting the doctor.

DISCUSSION

The results of the current study have shown that males have more compulsion in seeking medical information while being older was associated with less distress and less compulsion in this context. The other parameters studied had little influence on these aspects. The scale used to measure cyberchondria, not having a cutoff point, does not allow for a prevalence of this problem in the sample studied. However, the median values encountered in the study showed that in all subscales "mistrust in the medical professional" scored under 50% of the maximum possible value, showing that, in general, the cyberchondria levels in the studied sample should be low.

Currently, the total value of CSS was deliberately not used because the authors believe that having a subscale that uses an inverse connotation in relationship to the others (mistrust of medical professionals) may cause misinterpretation of results; others have even suggested that this subscale should be removed from this instrument[15,16]. This has created some difficulties in comparing our results with previous works from the literature. We found that increasing age was associated with less compulsion and less distress while Muse et al.[17] could not find a correlation of cyberchondria with age. Doherty-Torstrick et al.[18], in a study with 720 individuals, found that older persons had a lower propensity to worsen distress during and after online medical surveys than younger participants.

The most interesting results obtained presently were on the subscale "mistrust in the medical professional" which showed that females and individuals with higher income and more years of study trust more the doctors. The same happens with those living in urban areas. This last aspect is easy to understand when one notes that there are few

https://doi.org/10.7322/abcshs.2023059.2320

doctors in rural areas and that they are usually generalists. An interpretation for higher trust in the doctor from those more favored socially (better income and better education) may be related to the possibility of choosing their physician according to their preferences with consultations in private offices or through health insurance services rather than in the public health system. Nevertheless, these explanations are hypotheses that need further study for validation.

The univariate analysis showed that Afro-descendants trust doctors more than Caucasians. However, in the multivariate analysis, this variable did not keep its independence, due to the influence of educational and income levels of this subgroup of the population.

Excessiveness had higher scores than the compulsion and distress domains. These results agree with those from Makarla et al.[19] who detected that the dominant pattern was excessiveness of online searching, in 205 employees working in various information technology firms.

We also noted a correlation of the domains of "compulsion," "distress," "excessiveness" and "reassurance seeking" of CSS with the physical quality of life and of "compulsion" and "distress" with mental QoL. The influence of cyberchondria in QoL has also been described by Mathes et al.[20] who observed that cyberchondria may interfere with interpersonal relationships and the ability to work and that it increases the use of the health system. Others[21,22] observed cyberchondria to have deleterious effects such as doctor hopping, deteriorated mental health, and purchasing medical products online. So, it may cause a significant public health burden, warranting further investigations on how to treat and/or prevent its symptoms.

It is important to note that the obtained sample had a high percentage of individuals with more than 10 years of study which does not reflect the reality of Brazilian

https://doi.org/10.7322/abcshs.2023059.2320

society. It also had a predominance of females, and the sample of Afro-descendants is a limitation of the present study. This bias was caused by the technique of recruitment that selected a population with more access to technology and information. Nevertheless, this is the sample of individuals with access to the internet: the target population for this study.

Concluding, we have found that males and younger individuals have higher levels of compulsion in the CSS than females and the elderly. Mistrust of medical professionals was less common in females, in those living in urban areas, having more than 10 years of formal education, and earning more than 5 minimal wages/month.

REFERENCES

1. Ivanova E. Internet addiction and cyberchondria: Their relationship with well-being. J Educ Cult Soc. 2013;15(1):57-69.
https://doi.org/10.15503/jecs20131.57.70

2. Poel F, Baumgartner SE, Hartmann T, Tanis M. The curious case of cyberchondria: A longitudinal study on the reciprocal relationship between health anxiety and online health information seeking. J Anxiety Disorder. 2016;43:32-40.
https://doi.org/10.1016/j.janxdis.2016.07.009

3. Starcevic V, Berle D. Cyberchondria: towards a better understanding of excessive health-related Internet use. Expert Rev Neurother. 2013;13(2):205-13.
https://doi.org/10.1586/ern.12.162

4. Aikens M, Kirwan G, Berry M, O'Boyle C. The age of cyberchondria. Royal Coll Surg Ireland Student Med J. 2012;5(1):71-4.

5. White RW, Horvitz E. Cyberchondria: studies of the escalation of medical concerns in Web search. ACM Trans Inf Syst. 2009;27(23):1-37.
https://doi.org/10.1145/1629096.1629101

6. Zarcadoolas C, Blanco M, Boyer JF, Pleasant A. Unweaving the Web: An exploratory study of low-literate adults' navigation skills on the World Wide Web. J Health Commun. 2002;7(4):309-24.
https://doi.org/10.1080/10810730290088157

7. Atkinson NL, Saperstein SL, Pleis J. Using the Internet for Health-Related Activities: Findings from a National Probability Sample. J Med Internet Res. 2009;11(1):e4.
https://doi.org/10.2196/jmir.1035

8. Henderson EM, Keogh E, Eccleston C. Why go online when you have pain? A qualitative analysis of teenagers' use of the Internet for pain management advice. Child Care Health Dev. 2014;40(4):572-9.
https://doi.org/10.1111/cch.12072

9. Gray NJ, Klein JD, Noyce PR, Sesselberg TS, Cantrill JA. Health information-seeking behavior in adolescence: The place of the internet. Soc Sci Med. 2005;60(7):1467-78.
https://doi.org/10.1016/j.socscimed.2004.08.010

10. McElroy E, Shevlin M. The development and initial validation of the cyberchondria severity scale (CSS). J Anxiety Disorder. 2014;28(2):259-65.
https://doi.org/10.1016/j.janxdis.2013.12.007

11. Fergus TA. The Cyberchondria Severity Scale (CSS): An examination of structure and relations with health anxiety in a community sample. J Anxiety Disorder. 2014;28(6):504-10.
https://doi.org/10.1016/j.janxdis.2014.05.006

12. Andrade TL, Camelier AA, Rosa FW, Santos MP, Jezler S, Silva JLP. Applicability of the 12-Item Short-Form Health Survey in patients with progressive systemic sclerosis. J Bras Pneumol. 2007;33(4):414-22.
https://doi.org/10.1590/s1806-37132007000400010

13. Ware Jr J, Kosinski M, Keller SD. A 12-Item Short-Form Health Survey: Construction of Scales and Preliminary Tests of Reliability and Validity. Med Care. 1996;34(3):220-33.
https://doi.org/10.1097/00005650-199603000-00003

14. Silva FG, Andrade R, Silva I, Cardoso A. Cross-cultural adaptation of the Cyberchondria Severity Scale for Brazilian Portuguese. Trends Psychiatry Psychother. 2016;38(2):90-5.
https://doi.org/10.1590/2237-6089-2015-0063

15. Fergus TA, Russell LH. Does cyberchondria overlap with health anxiety and obsessive-compulsive symptoms? An examination of latent structure and scale interrelations. J Anxiety Disorder. 2016;38:88-94.
https://doi.org/10.1016/j.janxdis.2016.01.009

16. Norr AM, Oglesby ME, Raines AM, Macatee RJ, Allan NP, Schmidt NB. Relationships between cyberchondria and obsessive-compulsive symptom dimensions. Psychiatry Res. 2015;230(2):441-6.
https://doi.org/10.1016/j.psychres.2015.09.034

17. Muse K, McManus F, Leung C, Meghreblian B, Williams JMG. Cyberchondriasis: Fact or fiction? A preliminary examination of the relationship between health anxiety and searching for health information on the Internet. J Anxiety Disorder. 2012;26(1):189-96.
https://doi.org/10.1016/j.janxdis.2011.11.005

18. Doherty-Torstrick ER, Walton KE, Fallon BA. Cyberchondria: Parsing health anxiety from online behavior. Psychosomatics. 2016;57(4):390-400.

https://doi.org/10.1016/j.psym.2016.02.002

19. 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(2):87-92.
https://doi.org/10.4103/jpgm.JPGM_293_18

20. 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.
https://doi.org/10.1016/j.psychres.2018.01.002

21. Starcevic V. Keeping Dr. Google under control: How to prevent and manage cyberchondria. World Psychiatry. 2023;22(2):233-4.
https://doi.org/10.1002/wps.21076

22. Thomas SP. Addressing gaps in knowledge about cyberchondria. Issues Ment Health Nurs. 2023;44(7):583-4.
https://doi.org/10.1080/01612840.2023.2229718

Table 1: Main characteristics of the sample studied (n=948)

Variable	Value
Females/Males (n)	703 (74.2%) /244 (25.8%)
Median age - years (IQR)	32 (23-44)
Ethnic background (n)	
Afrodescendants	667 (70.3%)
Caucasians	266 (28%)
Other	15 (1.5%)
Housing	
Urban (n)	860 (90.7%)
Rural (n)	88 (9.2%)
Income (number of minimal wages) (n)	
1-3	377 (39.7%)
3-5	104 (10,9%)
> 5	51 (5.3%)
Years of formal study (n)	
<5	118 (12.4%
5-10	209 (22.0%)
>10	621 (65.5%)
Tobacco exposure (n)	
No use	816 (86.0%)
Ex-smokers	75 (7.9%)
Current smokers	57 (6.0%)
Alcohol use (n)	
No use	413 (43.5%)
Sporadically	483 (50.9%)
Regularly	52 (5.4%)
Employment (n)	
White collar/student	610 (64.3%)
Blue collar	215 (22.6%)
unemployed	123 (12.9%)
Chronic disease (n)	200 (21.0%)
SF-12 (physical domain)	48.4 ± 9.0
SF 12 (mental domain)	41.9 ± 11.4

IQR=interquartile range; SF-12=12-Item Short-Form Health Survey.

https://doi.org/10.7322/abcshs.2023059.2320

Table 2: Correlation studies of Quality of life and "compulsion", "distress", "excessiveness" and "reassurance seeking" subscales of the Cyberchondria Severity scale.

Study of Quality of Life (SF-12): Physical domain			
	Rho	95% Confidence interval	p
Compulsion	-0.13	-0,20 to -0,07	<0.0001
Distress	-0.14	-0.21 to +0.08	<0.0001
Excessiveness	-0.12	-0.18 to -0.05	0.0001
Reassurance seeking	-0.11	-0.17 to -0.05	0.0004
Study of Quality of Life (SF-12): Mental domain			
	Rho	95% Confidence interval	p
Compulsion	-0.08	-0,14 to -0,01	0.01
Distress	-0.12	-0.19 to +0.06	<0.0001
Excessiveness	-0.06	-0.12 to +0.002	0.051
Reassurance seeking	-0.06	-0.12 to +0.003	0.055

SF-12=12-Item Short-Form Health Survey

https://doi.org/10.7322/abcshs.2023059.2320