Unraveling the Cyberchondria Phenomenon: Unearthing the Intriguing Connection Between Its Dimensions and Health Outcomes

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ABSTRACT
Online health information is extensive and diversified, encompassing anything about the symptoms, diagnoses, and treatments of various diseases, as well as simply general information. The deluge of information from all types of media, on the other hand, has intensified various psychological ramifications connected with pandemics and epidemics, such as heightened health worry, medical concerns, and anguish, or what we term cyberchondria. We did a narrative review to have a better understanding of how cyberchondria affects individual health using many papers from 2019 to 2023 to learn more about cyberchondria. Medline, Scopus, Web of Science, and Academic Search Complete were among the databases used. According to the findings of 47 articles, Cyberchondria can produce symptoms of obsessive-compulsive disorder, which leads the body to experience excessive stress, resulting in a chronic allostatic system that can lead to a variety of cardiovascular and immunological disorders. For persons who currently have health issues, psychological discomfort can contribute to poor disease progression. In healthy individuals, psychological disturbance might contribute to immunological problems. Cyberchondria is also linked with internet addiction which has a significant influence on a person's physical health since it reduces physical activity, disrupts sleep patterns, and leads to obesity, as well as other physical issues such as pain in body parts and visual problems. Excessive reassurance seeking can result in anxiety, preoccupation, and skepticism of knowledge. Medical distrust, a well-documented barrier to care, has a negative influence on a number of health-related patient behaviors and outcomes across a wide range of medical settings.

Keywords: *cyberchondria, compulsion, distress, excessiveness, mistrust of medical practitioners, reassurance seeking.*

1. INTRODUCTION

Due to the quantity and coverage of information, the ease of searching, the affordability of access, interactivity, and anonymity, seeking health information online has become a favored method, supported by Asibey, S. et al. [1]. Patients and their families/friends are among those who seek health-related information online in order to improve their health or lifestyle, supported by Lu, L. et al. [2]. Online health information is comprehensive and diverse, including "anything about the symptoms, diagnoses, and treatments of various diseases, or simply general information about weight loss, healthy diets, or wellness tips", supported by Ghahramani et al [3]. Seeking health information online enables people to gain knowledge about their health difficulties, cope with health problems, make health decisions, and modify their behavior.

The availability of comprehensive health information has aided in the comprehension of the disease's significance, supported by Jokic-Begic et al [4] and the implementation of preventive measures, supported by Liu, L

Y. A. Yusran et al. (eds.), *Proceedings of the 2023 Brawijaya International Conference (BIC 2023)*, Advances in Economics, Business and Management Research 294,
https://doi.org/10.2991/978-94-6463-525-6_66

[5]. However, the flood of information from all forms of media has exacerbated various psychological repercussions associated with pandemics and epidemics, supported by Sauer S. et al[6], such as increased health anxiety, medical concerns, and distress, supported by Garfin et al [7]. The duration of online health searches, as well as the intensity of the resulting health anxiety, have been linked to a variety of negative outcomes and impairment with daily life functioning, supported byMAthes et al [8].

This is a disorder known as Cyberchondria, which is defined as a pattern of excessive Internet searching for medical or health-related material that has the following characteristics: Searching is compulsive, difficult to resist, and serves the purpose of seeking reassurance; initial relief, if obtained, is usually fleeting, and anxiety or distress usually worsens during these searches and persists afterwards; online searching takes precedence over other interests or daily activities and continues or escalates despite the occurrence of negative consequences associated with the searching, supported by Vismara et al [9].

According to certain studies, depression is linked to an increase in online health information seeking and health-related social media use, supported by Oh, Y et al. [10]. The presence of a chronic illness, such as breast cancer, supported by Perrault et al. [11] or orthopedic conditions, supported by Blackburn, J. et al. [12], as well as the severity of somatic symptoms, can also predict participation in online health information seeking, with cyberchondria being at the pathological end of the spectrum of online health information seeking behaviors, supported by Perrault et al. [11].

Many previous studies have discussed the relationship between cyberchondria and psychological problems and what are the causes of cyberchondria itself. However, not much has been shown about the impact of cyberchondria on one's health. Therefore, the aim of this study is to discuss the impact of cyberchondria on the health outcomes of a person who is initially healthy or who is already sick.

2. MATERIAL AND METHOD

2.1 Narrative Review

We conducted a narrative review in order to have a better grasp of how cyberchondria affects individual health. When the goal of the review is to gain a deeper understanding of the topic, a narrative review is preferable to a systematic review, supported by Grennhalgh et al [13]. Cyberchondria is a fairly large issue that is not commonly understood by the general public because it necessitates numerous sources of knowledge from diverse articles.

2.2 Data Sources

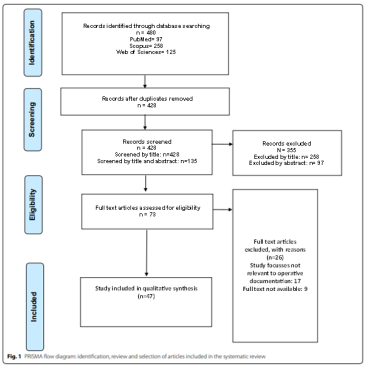

Figure 1 Overview of the search methodology

To get information about cyberchondria, we looked at various articles from 2019 to 2023. The databases included: Medline, Scopus, Web of Science, Academic Search Complete. Anthropological and social sciences

databases were also used to locate relevant articles. A number of keywords were applied. The searches used were: “Cyberchondria" AND “The Consequences” OR “The Impact”, OR “The effect” AND “Health Outcome” OR “Diseases Outcome”

3. RESULTS

Cyberchondria is connected with unfavorable health outcomes such as functional impairment, lower quality of life, reduced satisfaction with medical consultation, and greater health care utilization, supported by Mathes M et al [8]; Peng et al. [14]. This is related to the Cyberchondria Severity Scale (CSS), which was established by Eoin McElroy and Mark Shevlin to assess the severity of cyberchondria in patients. Cyberchondria is defined by five major dimensions: "compulsion, distress, excessiveness, reassurance seeking, and mistrust of medical professionals." This trait can influence how someone suffering from cyberchondria reacts to health-related issues, supported by Schenkel, S. et al [15].

3.1 Compulsion

Some aspects of cyberchondria appear obsessive, such as repetitive reassurance-seeking behavior that continues despite increased health worry and other negative emotional responses, supported by Starcevic et al [16]. Furthermore, compulsive behavior is frequently fueled by an intolerance for uncertainty. Cyberchondria and obsessive-compulsive disorder symptoms have a relatively strong link ($r = 0.49$), with the strength of the relationship varied and depending on the individual components of cyberchondria and specific obsessive-compulsive disorder symptoms, supported by Arsenakis et al. [17].

Perfectionism, preoccupation with detail, excessive dedication to work, hyperconsciousness, reluctance to discard useless objects, inability to delegate, miserliness, as well as stubbornness and rigidity are all traits associated with obsessive-compulsive personality disorder (OCPD), supported by Van Broekhoven et al. [18].

Obsessive-compulsive personality disorder and later physical diseases may be linked via a number of processes. Tobacco use, for example, is one of the lifestyle and behavioral characteristics associated with Cluster C personality disorders that may contribute to negative health outcomes, supported by Quirk et al [19]. Perfectionism has been demonstrated to predict the prevalence of obsessive exercise, a maladaptive pattern of behavior that increases the risk of injury and immunological issues Chamberlain et al [20]**.**

More broadly, Obsessive-compulsive personality disorder personality traits may have a deleterious impact on health due to a phenomenon known as allostatic stress. Allostatic load and its ramifications have been well discussed elsewhere. In brief, in reaction to stressful events, the body's systems promote adaptability and homeostasis, a process known as "allostasis." The autonomic nerve system, hypothalamic-pituitary-adrenal (HPA) axis, metabolic systems, and immune system are all involved in this reaction. Allostatic load, sometimes known as "wear and tear" on the body and brain, is caused by persistently underactive or overactive allostatic systems. The ramifications are profound: prolonged inactivity or overactivity can have negative health consequences. Autoimmunity can be caused by an insufficient endogenous glucocorticoid response (i.e., an underactive adaptive system). Obesity and Type 2 diabetes can be exacerbated by persistently high blood pressure and glucocorticoid levels (i.e., an overactive adaptive system). Critically, too much chronic stress causes these systems to tire or "wear", resulting in underactivity or overactivity of these allostatic systems, i.e., allostatic load, and subsequent "tear" on the body, supported by Morreale et al [21].

Allostatic load has been linked to a variety of negative health consequences in the larger public health literature. High blood pressure, stroke, myocardial infarction, and cardiovascular and heart disease have all been linked to allostatic strain in the cardiovascular system, supported by Guidi et al [22]. Allostatic stress has also been connected to metabolic disorders such as diabetes, immunological conditions such as arthritis/rheumatism, asthma, and even multi-system diseases such as cancer, supported by Akinyemiju et al [23]**.** Through this review, it can be concluded that cyberchondria has a bad impact on health outcomes because it can cause symptoms of obsessive-compulsive disorder which causes the body to experience excessive stress resulting in allostasis or the body system's efforts to increase adaptability and homeostasis. An allostatic system that occurs continuously can cause several cardiovascular and immunological diseases.

3.2 Distress

When someone searches for information regarding a symptom, the probable outcome is that the search results reinforce the perceived threat. As a result of the concern and stress, people continue to use the internet for health-related purposes, even to the point of inquiry escalation. As a result, metacognitive thoughts about the online search and its potential negative implications develop, causing anxiety, supported by Schenkel et al [15]. A Pearson correlation analysis revealed a substantial positive fair connection ($rs = 0.373$, $P < 0.05$) between cyberchondriac events and psychological discomfort, supported by Al Dameery et al [24].

Distress may have negative health consequences regardless of its link to stress and the physiological impacts of stress. This could happen indirectly through distress-related actions that contribute to poor health risk, supported by Barry et al [25]. For example, distress can impair a person's capacity to cope with and handle life events, which can have an impact on health. Alternatively, stress can have a deleterious impact on the immune system. Chronic stress, for example, might inhibit cytokine release, resulting in a diminished immunological response.

Distress was evaluated in a variety of methods, with higher levels increasing the risk of poor health outcomes over time. Specific concerns identified included mortality, the development of asthma in adulthood, poor physical performance in cancer patients, and lower medication adherence in those with chronic diseases. Distress may influence health through a variety of mechanisms. For example, diabetes-specific distress may affect health through self-care habits, but general chronic upset may impact health via the immune system, supported by Barry et al [25].

Cyberchondria can increase and worsen a person's distress. For people who already have health problems, psychological distress can lead to disease progression and poor disease outcomes. Meanwhile, in healthy people, psychological distress can lead to diseases related to immunological disorders.

3.3 Excessiveness

Cyberchondria is defined by excessive internet searches for medical information and is linked to increased levels of anguish, anxiety, and interference with daily activities. Indeed, Cyberchondria shares phenomenological characteristics with a subtype of problematic Internet use in which individuals spend an inordinate amount of time online seeking information, typically news or documentary-related information. A recent study labeled this habit "online news addiction," which was found to be connected with high levels of future anxiety and low levels of interpersonal trust, two traits that could likely lead to Cyberchondria, supported by Shabahang et al [26]. The association between Cyberchondria and symptom intensity of Internet addiction, supported by Batigun et al [27]; Selvi et al [28] was much stronger than the one between Cyberchondria and health anxiety, supported by McMullan et al [29]. Although Cyberchondria may resemble a behavioral addiction in some circumstances, it does not appear to manifest the full set of potential diagnostic criteria for these disorders, particularly symptoms of tolerance or withdrawal proposed in the DSM-5 prototype definition of Internet gaming disorders. However, in the ICD-11, tolerance and withdrawal are not considered important criteria for a diagnosis of behavioral addiction, supported by Castro-Calvo [30].

Excessive Internet use can lead to concerns such as addiction and interference with daily life, posing a substantial public health hazard, supported by Herreo et al [31]. Excessive Internet use has been linked to psychosocial problems such as failure to distinguish between the real and virtual worlds, maladaptation in life, and avoidance of interpersonal relationships, as well as excessive fatigue and reduced sleep duration, supported by Shadzi et al [32]. A number of researchers have found a link between excessive Internet use and depression, anxiety, sleep quality, and physical activity, supported by Shadzi et al [32]. Furthermore, poor mental health and lack of physical activity might have a negative impact on subjective health status. Obesity, excessive Internet use, and addictive behaviors were all linked in a study of European adolescents, supported by Kwak et al [33].

People who were addicted to the internet were also more likely to suffer from shoulder (39.2%), eye (62.2%), and neck pain. Similarly, studies have linked internet addiction to neck and hand discomfort, as well as visual tiredness. Furthermore, smartphone addiction-induced neck and shoulder discomfort can lead to musculoskeletal illnesses in the long term, supported by Akodu et al [34]. Continuous internet use can also result in poor posture, producing pain in many sections of the body, supported by Soliman et al [35]. Other research discovered that De Quervain tenosynovitis, or wrist pain, is closely linked to various electronic devices, supported by Baabdullah et al [36]. Texting and conversing on smartphones have been identified as risk factors for De Quervain tenosynovitis, supported by Bahathiq et al [37].

The relationship between cyberchondria and excessive internet searches can cause internet addiction. Internet addiction has a huge impact on a person's physical condition because it can reduce physical activity, disrupt sleep patterns, and nutritional problems that cause obesity, as well as other physical problems such as pain in body parts and vision problems.

3.4 Reassurance Seeking

Individuals seeking reassurance about their health may devote a significant amount of time to determining the veracity of health-related information. This practice contributes to the cycle of increased distress and anxiety caused by recurrent online searches.

Recurrent engagement in reassurance-seeking actions may, paradoxically, worsen anxiety levels. As this process continues, obsession with sickness develops, supported by Higgins-Chen et al [38]. If a person is afraid of contracting a disease, he or she may engage in reassurance-seeking activity such as checking physical sensations, hand washing, or repeated media searches. Because people with serious health worries may seek reassurance, reassurance-seeking behavior can be an indication of sickness obsession, supported by Katz et al [39].

Excessive reassurance seeking was originally investigated in the context of depression. It increases the likelihood of experiencing depressed symptoms. According to Coyne's interpersonal theory of depression, depression with reassurance-seeking behavior can lead to interpersonal issues such as loneliness or devaluation. Depression is also linked to anxiety symptoms, supported by Kim et al [40].

When excessive-reassurance seekers are stressed or sad, they may seek reassurance from significant others, expecting them to help them manage their feelings. People who were high excessive-reassurance seekers tended to regulate their own depressed feelings by involving significant others (e.g., demanding their affectionate support) as well as intrapersonal strategies (e.g., rumination and problem solving), resulting in higher depression. It appears that they are underutilizing their larger interpersonal networks. In order to understand how excessive-reassurance seekers affect their well-being and sadness, it is necessary to consider the breadth of the interpersonal networks that these persons use to manage their own emotions, supported by Abe et al [41].

Someone who does excessive reassurance seeking can cause anxiety, obsession, and distrust of information even if the information comes from a valid source. This will influence how the person manages their health and influences how the person accesses health services.

3.5 Mistrust

Uncertainty intolerance has also been connected to cyberchondria. A rise in the feeling of uncertainty has been found following health-related online searches, particularly when information appears dubious. Uncertainty leads to increased searches in the goal of finding a definitive answer. In the context of online searches for health information, intolerance of uncertainty appears to be a key predictor of health anxiety, supported by McMullan et al [29]. With correlation coefficients of 0.47, supported by Fergus et al [42], 0.50, supported by Norr et al [43], and 0.52, supported by Fergus et al [44], a moderately strong association between cyberchondria and the inhibitory kind of uncertainty intolerance (understanding of uncertainty as paralyzing) has been discovered, supported by Arsenakis et al [17]. Cyberchondria is less strongly associated with prospective intolerance of uncertainty (future intolerance of uncertainty), with correlation coefficients of 0.33, supported by Fergus et al [42], 0.38, supported by Norr et al [43], and 0.44, supported by Fergus et al [44].

Mistrust of medical professionals (hereinafter mistrust) shows online searchers' conflict about whether to trust their medical professional over their own research results and self-diagnosis, supported by Schenkel et al [15]. Finally, cyberchondria can cause a person to be confused about whether they should believe what they read on the internet and conclude about their sickness or what medical people say about their disease. This confusion emerges as a result of their ambiguity regarding the information they receive.

Mistrust is usually enough to predict health behavior. Medical mistrust, a documented barrier to care, has a detrimental impact on a variety of health-related patient behaviors and outcomes across a wide range of medical contexts. Medical mistrust has been linked to reduced medication adherence, fewer cancer screenings, supported by Quinn et al [45], disregard for medical advice, missing follow-up appointments, worse satisfaction with care, lower self-reported global health, and decreased quality of life, supported by Kinlock et al [46]**.** Medical mistrust is continuously higher in racial and ethnic minority adults and underserved groups, supported by Angelo et al [47].

Table 1. Major Dimensions of Cyberchondria

Major Dimensions of Cyberchondria	
Compulsion	● Repetitive reassurance-seeking behavior ● Strongly linked with OCD ● Induces allostatic stress

	• Can lead to detrimental health consequences
Distress	• Leading to psychological discomfort and negative health outcomes • Emphasizing the detrimental impact of cyberchondria on overall well-being
Excessiveness	• Excessive internet searches for medical information • Lead to heightened anguish, anxiety, and disruptions in daily life • Correlates more strongly with internet addiction than with health anxiety.
Reassurance Seeking	• Leads to heightened distress and anxiety • May contribute to the development of sickness obsession • Associated with symptoms of depression and anxiety • Tend to seek support from significant others during times of stress or sadness • Potentially leading to interpersonal issues and further depression • Also impacts their trust in information sources and utilization of healthcare services
Mistrust	• Cyberchondria prompts mistrust in medical professionals, leading to conflict between self-diagnosis and professional advice • Significantly predicts health behavior • Reduced medication adherence • Missed screenings • Lower satisfaction with care • Prevalent in minority and underserved groups • Detrimental effects on overall well-being and healthcare utilization

4. CONCLUSION

Cyberchondria affects many aspects of human life. Based on the five features of cyberchondria (compulsion, distress, excessiveness, reassurance seeking, and mistrust of medical providers), cyberchondria can have an impact on both physical and psychological health outcomes.

Cyberchondria has a negative influence on health outcomes because it can produce symptoms of obsessive-compulsive disorder, which leads the body to experience excessive stress, resulting in allostasis, or the body's efforts to improve adaptation and equilibrium. A chronic allostatic system can lead to a variety of cardiovascular and immunological disorders. Cyberchondria can exacerbate and worsen someone's discomfort. For persons who currently have health issues, psychological discomfort can contribute to disease progression and poor consequences. Meanwhile, in healthy individuals, psychological disturbance might contribute to immunological problems. The link between cyberchondria and extensive online searches might result in internet addiction. Internet addiction has a significant influence on a person's physical health since it reduces physical activity, disrupts sleep patterns, and causes dietary difficulties that lead to obesity, as well as other physical issues such as pain in body parts and visual problems. Excessive reassurance seeking can result in anxiety, preoccupation, and skepticism of knowledge, even if it comes from a reliable source. This will affect how the person controls their health and how they get health care. Mistrust is often sufficient to predict health behavior. Medical distrust, a well-documented barrier to care, has a negative influence on a number of health-related patient behaviors and outcomes across a wide range of medical settings.

As a result, it is critical to conduct additional research on how to prevent cyberchondria through screening media or health information.

AUTHORS' CONTRIBUTIONS

The authors confirm contribution to the paper as follows: study conception and design: Thareq Barasabha; Data collection: Ayu Cetiya Mahayekti; Analysis and interpretation of results: 1. Ayu Cetiya Mahayekti,; draft manuscript

preparation: 1. Ayu Cetiya Mahayekti, 2. Thareq Barasabha, 3. Iffatun Nisak Kamaliyah, 4. Muhammad Abdul Raziq. All authors reviewed the results and approved the final version of the manuscript.

ACKNOWLEDGMENTS

The researcher would like to thank profusely to all parties involved in the preparation of this narrative review.

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