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Review Paper

Cyberchondria: Review on Understanding Role of Health Anxiety, Health Locus of Control and Intolerance of Uncertainty

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ABSTRACT

Cyberchondria is a growing phenomenon where people repeatedly search online for health information, which instead of reducing worry, often increases anxiety. This review examines the psychological factors linked to cyberchondria, including health anxiety, health locus of control, and intolerance of uncertainty. Historical and theoretical perspectives how that cyberchondria has evolved from a narrow focus on hypochondriasis to a broader, multidimensional construct. Recent researches highlights that health anxiety plays a central role in cyberchondria, acting in a reciprocal cycle with online health searching. External health locus of control and intolerance of uncertainty further influence the tendency to engage in excessive online health information seeking. Despite the progress, the existing researches are mostly cross- sectional, Western-focused and often study variables in isolation. Future researches should explore these variables together, include diverse population, investigate protective measures and strategies. Understanding this is critical for identifying individuals at risk and developing effective ways to reduce distress caused by cyberchondria.

Keywords: *Cyberchondria, Health Anxiety, Health Locus of control, Intolerance of Uncertainty*

Today, health-related information is available to almost everyone through internet. With just a few clicks, people can search their symptoms, read about disease, and even look at treatment options. This easy access can be helpful because it increases awareness and helps people understand their body better. However, it can also create confusion and fear. Sometimes, instead of feeling calm after searching online, people feel even more anxious. This is where the concept of cyberchondria becomes important.

Vladan Starcevic and David Berle (2013) explained cyberchondria as excessive or repeated online searching for health information that is done with aim to reduce distress, but instead makes the anxiety worse. Later, Vladan Starcevic and Elias Aboujaoude (2015) said that these searches actually keep the anxiety cycle going. So. Cyberchondria is not just about searching a lot. It is about searching again and again for reassurance and still ending up more worried than before. The construct was further operationalized by development of the Cyberchondria Severity Scale by Eoin McElory and Mark Shevlin (2014), which identified

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key dimensions including excessiveness, compulsiveness, distress, reassurance seeking, and mistrust of medical professionals. Despite the growing empirical base, cyberchondria remains a conceptually debated, and not formally recognized, indicating the need for theoretical clarity.

The need for understanding cyberchondria lies in its increasing prevalence and its potential clinical consequences. Increased online health searching is associated with rise in health anxiety, functional impairment, increased healthcare utilization and reduced trust in medical professionals. This is more important because we live in a digital world, if we do not understand it properly, it can quietly affect mental health in many people, especially young adults who use internet frequently.

Even though many studies talk about cyberchondria, most of them focus on it alone. But cyberchondria does not happen by itself. It is strongly connected to other psychological factors. One important factor is health anxiety, which means worrying too much about having a serious illness. Another factor is health locus of control, which means whether a person believes their health is controlled by themselves or by external factors like fate or doctors. The third factor is intolerance of uncertainty, a vulnerability factor, which means perceiving uncertainty as threat. These factors may explain why some people search once and move on, while others get stuck in a cycle of fear and repeated searching.

The objective of this review is to understand cyberchondria more clearly by studying it along with health anxiety, health locus of control, and intolerance of uncertainty. First, the paper will explain how the idea of cyberchondria developed over time. Then it will discuss any possible theories that can explain why it happens. After that, it will look at recent research and group finding under each psychological factors Finally, it will point out what is still missing in research and what future studies must focus on. By doing this, the paper aims to give a clearer picture of why's behind cyberchondria and why is it important to look at the holistic picture.

Historical Development of Cyberchondria

The idea of cyberchondria developed as the internet became a common source of health information. In the early 2000s, people began noticing that many individuals were using search engines to check their symptoms, often leading to increased fear instead of reassurance. The term "Cyberchondria" itself was popularized in 2001 by journalist Paul Valley, who described it as a new problem emerging in digital age (Starcevic and Berle, 2013). At that time, it was mostly seen as a modern version of hypochondriasis, where the internet simply replaced medical books or repeated doctors visit.

As research progressed, scholars begin to define cyberchondria more clearly. Vladan Starcevic and David Berle (2013) described cyberchondria as excessive online health searching that increases anxiety instead of reducing it. They explained that people search for reassurance, but because online information often includes serious or worst-case possibilities, it creates more worry. A major development happened in 2014 when Eoin McElroy and Mark Shevlin created the Cyberchondria Severity Scale. This scale helped researchers measure cyberchondria properly and showed that it has multiple parts. This shifted the understanding of cyberchondria from being just "too much searching" to being a multidimensional psychological construct.

Over time, researchers also began studying how cyberchondria related to other mental health factors. Studies by Vismara et al. (2020) and Schenkel et al. (2021) suggested that cyberchondria may be a part of larger transdiagnostic framework, meaning it overlaps with different anxiety related problems such as health anxiety and obsessive-compulsive symptoms. During the COVID-19 pandemic, research by Starcevic et al. (2020) further showed how uncertainty and constant exposure to online information increased cyberchondria symptoms worldwide.

Overall, the understanding of cyberchondria has moved from being seen as simple internet habit to being recognized as a complex psychological pattern.

Theoretical Framework Explaining Cyberchondria

To understand why cyberchondria happens, researchers mainly use cognitive-behavioral and transdiagnostic models.

The cognitive-behavioral model, originally developed for health anxiety by Paul Salkovskis, explains that people misinterpret normal body sensations as signs of serious illness. This creates fear, which leads them to seek reassurance. In the past, reassurance meant visiting doctors. Today, it often means searching online. However, because online information can be unclear or alarming, the person finds more reasons to worry. This temporarily reduces uncertainty but strengthens anxiety in the long term. In this way, online searching becomes a safety behavior that keeps the anxiety cycle active.

More recently, transdiagnostic perspectives proposed by Vismara et al. (2020) describe cyberchondria as a pattern that connects multiple vulnerabilities—health anxiety, uncertainty intolerance, compulsive tendencies, and digital overexposure. Instead of being a separate disorder, it may represent a behavioral expression of underlying anxiety processes in the digital age.

These frameworks provide the foundation for understanding how psychological vulnerabilities interact with digital notions to maintain cyberchondria.

Psychological factors and Cyberchondria

Recent researches have move beyond defining cyberchondria and has focused more on understanding the psychological mechanisms that maintain it. Rather than treating cyberchondria as an isolated digital habit, contemporary studies increasingly situate within broader anxiety related and transdiagnostic frameworks.

Health anxiety as central to cyberchondria

Recent research has started to understand health anxiety as a dimensional construct, meaning it can range from normal everyday health concerns to severe clinical levels. Health anxiety refers to excessive or inappropriate fear and worry about one's health, where normal bodily sensation is often misinterpreted as signs of serious illness (Bailer et al., 2016).

The earlier discussed cognitive behavioral model by Salkovskis and Warwick (1986,1990) has explained how health anxiety is maintained by a vicious cycle. Early validation work by Fergus (2014) showed that all components of cyberchondria especially distress and excessiveness, were positively related to health anxiety. This was important because it confirmed cyberchondria was not random internet use, but closely connected to pre-existing health fears. Similarly, Mathes et al. (2018) found that although cyberchondria and health

anxiety are strongly related, they are not exactly same thing. Even after controlling for health anxiety, cyberchondria predicted higher functional impairment and greater healthcare use.

A major shift in understanding came from the longitudinal study by te Poel et al. (2016). Instead of viewing cyberchondria as only a result of health anxiety, their four-wave study showed a two-way relationship. Higher health anxiety predicted more online searching, and more searching predicted higher health anxiety over time. Supporting this, McMullan et al. (2019), in a systematic review and meta-analysis, found a moderate relationship between general online health searching and health anxiety, but a much stronger association between health anxiety and cyberchondria. Interestingly, the association was stronger in younger individuals, suggesting the digital exposure may increase vulnerability.

Research during the COVID-19 pandemic further strengthened this connection. Jungmann and Witthoft (2020) found that individuals with higher health anxiety and cyberchondria reported greater coronavirus-related anxiety. However, adaptive coping and feeling well-informed reduced this effect. This shows that while health anxiety is a strong risk factor, protective mechanisms also matter.

More recent research has tried to understand deeper mechanisms. Arsenakis et al. (2021) reported that health anxiety was the strongest predictor of cyberchondria compared to other psychological variables. Meanwhile, Nadeem et al. (2022) found that maladaptive metacognitive beliefs strengthened the relationship between health anxiety and cyberchondria. This suggests that not only presence of health anxiety, but also how individuals think about their worries, plays a role.

Overall, research clearly shows that health anxiety plays a major role in starting and maintaining cyberchondria, but it does not fully explain why some individuals develop severe and persistent online health-searching behaviors while others do not. This leads to the importance of examining other psychological factors.

Cyberchondria and Health Locus of Control

Health locus of control refers to a person's belief about whether their health is controlled by their own actions (internal locus) or by outside forces such as doctors, fate or luck (external locus). Since cyberchondria involves repeatedly searching for reassurance online, researchers have questioned whether people who believe health is controlled by externally may rely more heavily on internet sources.

Although fewer studies have examined this factor compared to health anxiety available findings suggests meaningful connections. Abdelsattar et al. (2021) studied adults from 15 Arab countries during the COVID-19 pandemic and found that cyberchondria severity was positively associated with external health locus of control. Individuals who believed their health depended on powerful others (like doctors) or external systems reported higher cyberchondria. Interestingly, health anxiety did not mediate this relationship, suggesting that health locus of control may influence cyberchondria more directly.

Similarly, Mehta (2023) explored cyberchondria in relation to external health locus of control and found support for its role as a possible vulnerability factor. Individuals who felt less personal control over their health were more likely to engage in repeated online

searches. This makes sense because when people feel powerless, they may turn to the internet to regain a sense of control or certainty.

However, research in this area is still limited. Most studies focus mainly on the external dimension, and very few examine how internal locus of control may act as protective factor. There is also limited longitudinal research, so it is unclear whether external locus of control leads to cyberchondria over time or develops as a consequence of it.

Cyberchondria and Intolerance of Uncertainty

Intolerance of uncertainty (IU) refers to a person's difficulty in tolerating situations where outcomes are unknown. Since health symptoms are often unclear and unpredictable, IU is considered a strong theoretical factor in cyberchondria.

Research consistently shows that individuals with high IU are more likely to engage in excessive online health searches. Fergus (2013) found that online health searching increased anxiety only in individuals with high IU. For those with low IU, searching did not significantly raise anxiety. This suggests that IU acts as a vulnerability factor rather than a universal cause.

Further research by Norr et al. (2015) showed that inhibitory IU (freezing or feeling stuck when uncertain) strongly predicted cyberchondria even after controlling for health anxiety. Prospective IU (desire to predict future events) showed weaker associations. Similar findings were reported by Fergus (2015) and Spada (2017), supporting that inhibitory IU has a stronger relationship with cyberchondria.

However, the findings are not entirely consistent. Starcevic et al. (2019) suggested that while IU is related to cyberchondria, the association is weaker compared to health anxiety and problematic internet use. Similarly, Yilmaz et al. (2021) found that IU did not uniquely predict cyberchondria after including anxiety sensitivity and somatosensory amplification. This indicates that IU may work indirectly through other anxiety-related mechanisms.

A large review by Vismara et al. (2020) identified IU as a key transdiagnostic mechanism in cyberchondria, but also highlighted methodological inconsistencies across studies. More recently, Bahadir and Dundar (2024) found a moderate positive correlation between IU and cyberchondria among Turkish students and noted that reliance on unreliable sources increased severity.

Over all, IU appears to play an important but complex role. While many studies support this involvement, some suggest its effect may depend on other factors.

Critical synthesis and identified gaps

Across these psychological domains, health anxiety clearly emerges as the strongest and most consistent predictor of cyberchondria. Intolerance of uncertainty also plays a significant role, especially the inhibitory dimension. Health locus of control appears relevant but remains under-researched.

However, several important gaps remain:

1. Most studies are cross sectional, limiting understanding of long tern causal relationship.

2. Research is heavily concentrated in Western countries, with limited data from non-Western contexts like India.
3. Many studies examine single predictors separately rather than integrating multiple psychological factors in one model.
4. Protective factors and cultural influences remain understudied.

Because of these gaps, further research that examines multiple variables together withing diverse population in necessary. A more culturally sensitive approach can help clarify how these psychological factors interact and which ones are important in predicting different levels of cyberchondria severity.

CONCLUSION

Cyberchondria is more than just checking symptoms online, it is a cycle that makes people worried about health. Health anxiety, intolerance of uncertainty, and thinking your health is controlled by others all make it worse. People with high health anxiety search more, which increases their worry. Those who can't handle uncertainty or think others control their health are specially at risk. But most studies look at one factor, or focus on western countries, so we still don't fully understand how it works together. Understanding cyberchondria better can help doctors and people figure out how to handle health worries in today's online world.

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