

# Cyberchondria: Physiology of Anxiety Due to Health-Related Information From the Internet

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Cyberchondria in other sense is also known as “compuchondria” is a groundless upsurge of wordiness about common symptoms based on analysis of search results and medical literature online. It also includes the features of OCD and anxiety. The internet as an informational medium may exert unique effective pressure on those with health anxiety. Information from the web is often of unregulated accuracy, where benign symptom inquiry into a search engine may show as malignancy. People aged between 30-40 years are the most active health information seekers on the net. There are many psychological theories of seeking behaviour from the internet. Hesitant people, white coat anxiety people, physically challenged people and people who exhibit socio phobic nature or extreme introverts, show a defensive nature for reaching out to health centres. There are limitations of Google doctor's search clinic. It may escalate one's apprehensive feelings toward health. It may lead to delays in seeking health professional services. It may misdirect and it may speed up or worsen the existing health condition. Past history of the individual's health will be unknown to Google Dr.<sup>15</sup>

**KEYWORDS:** *Cyberchondria, Anxiety, Internet, Google, Doctor*

## INTRODUCTION

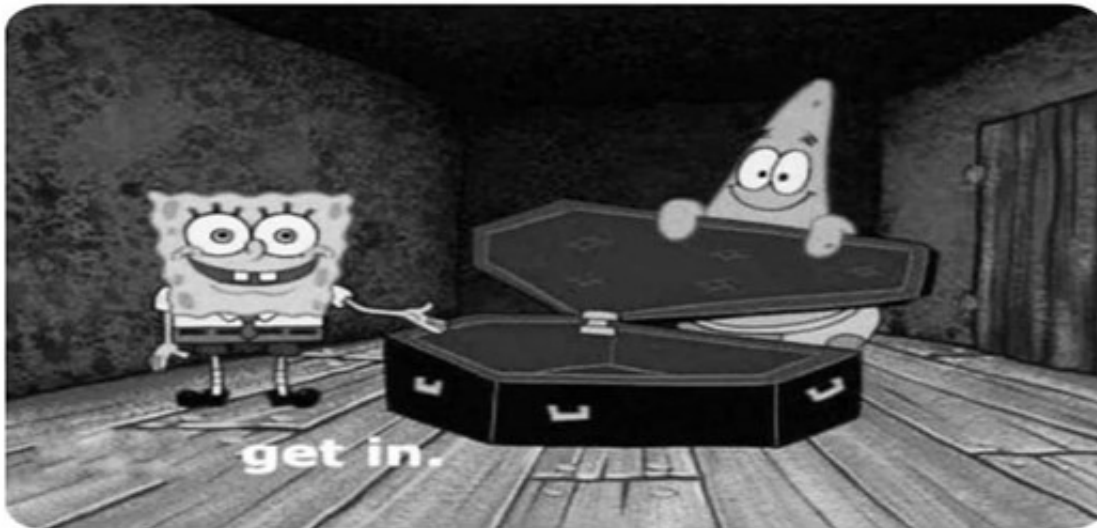
We all have done it. You have a symptom, say: a persistent cough and instead of going to your local doctor, you turn on your computer or smartphone and rely on the powers of Google to self-diagnose. If you dig deep enough into the digital ether - you will likely find what you are looking for, i.e. the worst scenario...! Such as your cough for a few days means lung cancer. The internet is a world where within minutes, a muscle twitch becomes ALS (Amyotrophic lateral sclerosis), migraine morphs into a brain tumour and that funny-looking mole is a MELANOMA...!! (Figure 1)

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Me: why does my chest hurt?

Google:



**Figure 1.** *Google can make simple symptoms into serious disease*

Etymology - 'Portmanteau neologism' - derived from the terms cyber and hypochondria.

Cyberchondria, in another sense, also known as "compuchondria" is a groundless upsurge of wordiness about common symptoms based on analysis of search results and medical literature online.

Persons, due to their, reassurance-seeking tendency, and their health-related anxiety engage in health-related searches in the internet, which nowadays is at the tip of the fingers for everyone and easily accessible also.<sup>1</sup> They trace the information, which pushes them to more anxiety and distress. A little over a decade ago, a British newspaper termed this phenomenon as 'CYBERCHONDRIA' - a term that is talk of the current medical lexicon. "Kelly Harding" a psychiatrist specialized in health anxiety and assistant professor of psychiatry at Columbia University Medical Centre in NewYorkCity, calls cyberchondria as 'the new frontier of hypochondria'. It is said that it also includes the features of OCD and anxiety. So, some argue that it's a combination of both clinical pathologies.

A recent case which propped up and was a high coordinate example which an American psychological university found was of a 36 yr old writer "Abel's". After nursing her baby Collen, Abel developed an itchy red rash on her right breast. The first result, after opening a laptop and investigating her symptoms, blared was "Inflammatory breast cancer"- 'and that scared me out of my mind' Abel said. Spending about 3 hours daily sessions on Google she got more confirmation about the diagnosis.<sup>2</sup>

After 2 months of devoted chat room search regarding inflammatory breast cancer, too scared to go to an urgent care clinic, she consulted a primary care doctor who told her she did not have cancer but a thrush, a benign condition that cleared up fast with a simple antifungal regimen. Remarkably thrush had never appeared on any of her Google searches! "You shouldn't be embarrassed to show up at the doctor once in a while if you're worried and never be ashamed of that".

Excessive checking behaviour is also related to health anxiety.<sup>3</sup> Additionally, the internet as an informational medium may exert unique affective pressure on those with health anxiety. Information from the web is often of unregulated accuracy, where benign symptom inquiry into a search engine is likely to return a high rate of disproportionate and statistically unlikely explanations, such as – life-threatening illness. In general, users are unlikely to be sceptical about the quality of information obtained or attend to the base rate of illnesses. Those worried about illnesses are even less likely to attend to source validity and are more frightened of what they see. Further, moderate levels of anxiety and increased checking with non-clinical samples are related to an increased number of medical appointments, increased likelihood of feeling “frightened” of health-related online information and worsening of health anxiety.

## LITERATURE

Imperial College of London - 2018 - Sep: concluded that the condition is leading to a health anxiety epidemic in UK. A study conducted by economic health researchers estimated that costs to the public health care system of such a condition are around 420 Euros/yr for appointments alone, with millions more spent on needless investigations and treatments.<sup>4</sup> American Med Informatics Association - 2009: states that 2 out of 5 people present with increased anxiety, frequently self-diagnosing with a list of differential diagnosis neither has accuracy nor they display any close regard with incidence, prevalence or any relevant risk factors. Websites provoke users to think about extremely sparse and infrequent diseases as the reason for their complaints. The Internet is a vast literature with common manifestations for many disorders, which appear side by side. Individual users without proper medical knowledge arrive at a worse medical diagnosis than the actual one.<sup>5</sup>

Alexandra and Andrei Holmes (Department of Psychology)- in their cyberchondria during pandemic article say – cyberchondria is due to the misbalance of opposing traits in an individual. 1) Optimism – a feeling of future will be good 2) Neurotism – to experience negative effects including anger, anxiety, self-consciousness, irritability, emotional instability and depression<sup>6</sup>. Bento et.al 2020 – Recently, when concerned about the new covid breakdown in 2020, folks researched for most common symptomatology of covid-19, especially regarding loss of taste and smell. The search engine for above-mentioned curiosity increased in America by 36% as soon as the first covid case assessment was done on the first day itself.<sup>7</sup>

Andrearson et.al 2007 – conducted a study and found that people aged between 30-40years are most active health information seekers on net.<sup>8</sup> Mccurcell and Costa 1994 –After a genetic predisposition study, states that increased expression of neurotism trait i.e a conditional, unstable predisposition towards more negative emotions, more negative cognition favours the reason of increased health information anxiety seekers.<sup>9</sup> James and Darren Mays 2010 - says females are considered more compulsive victims of cyberchondriac nature as compared to males.<sup>10</sup>

## PSYCHOLOGICAL THEORIES OF HEALTH - RELATED INFORMATION SEEKING BEHAVIOUR VIA INTERNET

1. *Recognition - Metacognition model*: also known as “Brenda Dervin’s sense making methodology”. A 1980’s human computer interaction based model describes – human subjects using certain specified metacognitive processes to assemble, substantiate and adapt for situational awareness of an unrecognized situation. It is also termed as ‘in executive cognition,’ i.e. an individual is aware of how they analyse a situation. People know their strengths and weaknesses. The conscious mind for cognitive judgement is in control. Henceforth, the first theory states due to abolishment of this ‘in executive cognition, cyberchondriac person fails to perceive, analyse and act as expected by normal people’ response.<sup>11</sup>
2. *Path of least resistance*: also known as “Zip’s – principle of least effort”. This theory states

that people will naturally choose the ways which take the least effort to get/reach the target. It conceptualizes the concept of people usually taking the most appropriate lookout method for information seeking in the least resisting mode available. They grasp the information as soon as minimally acceptable results are found. Anyhow this theory is accepted true by few regardless of user's expertise as a researcher or his/her level of subject competence.<sup>12</sup>

3. *Life in the round theory*: According to this theory, most housewives (homebound), hesitant people, white coat anxiety people, physically challenged people and people who exhibit socio phobic nature or extreme introverts show a defensive nature for reaching out to health centres. Such a defensive nature lead towards internet health info search engine websites addiction, which gives them a collar of security, confidentiality and comfort internal environment to express the untold fears of depth regarding health issues.<sup>13</sup>

## **CYBERCHONDRIA AND HYPOCHONDRIA**

Hypochondria - "melancholy" (excess of black bile) - is characterized by markedly depressed mood, bodily complaints and sometimes hallucinations, and delusions. Victims experience a cycle of intrusive thoughts followed by compulsive checking behaviour. Genetic contribution to the future development of cyberchondria is about 10-37%.

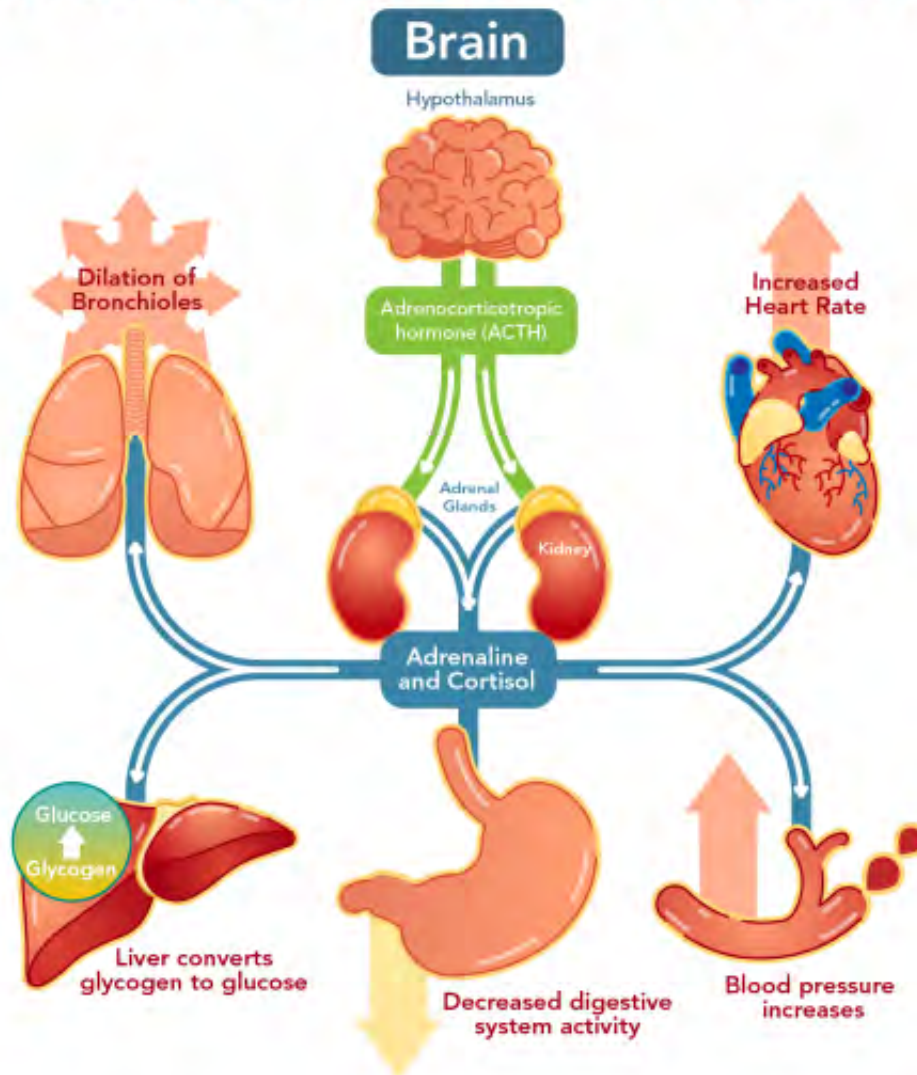
'Anxiety' is a spontaneous response to unspecified threats, internal disputes, and circumstances lacking translucent solutions for the situational eventuality. Such outcomes are usually associated with significant stress. The unpredictability of such situations spotlights for lack of self-cognitive control, which contributes to triggering an anxiety attack and makes endurance more difficult. The fore mentioned events lead to autonomic changes taking place in the body which further worsens by increasing sympathetic activity (may present in the form of hypertension, tachycardia etc.) and increased neuroendocrine response (i.e. via hypothalamo-pituitary-adrenal axis increases stress hormone cortisol release). Vulnerability elements for the occurrence of anxiety are as follows:

1. Genetic origin - Generalised biological vulnerability
2. Arising due to an impact of early life -Generalised psychological vulnerability
3. A particular event or situation focused - A specific psychological vulnerability

## **PHYSIOLOGY OF ANXIETY RELATED TO CYBERCHONDRIA**

Locus ceruleus and arousal - These are the core brain centres where feelings of anxiety are organized. From here, ascending nor-adrenergic system originates, which contains a large proportion of nor adrenaline cell bodies found in the brain. These fibres project to the paraventricular nucleus in hypothalamus, then passing via the HPA axis triggers a stress response associated with increased anxiety. Along with the HPA axis also stimulates amygdala, nucleus tractussolitarii, bed nucleus of striaterminalis, all of which are involved in the development of fear/anxiety response (Figure -2). As per the knowledge of cyberchondria related health anxiety is due to the increased genetic trait expression of neurotism factor, cognitive representation of fear associated with health issues preferentially involves LEFT AMYGDALA.<sup>14,15</sup>

## STRESS RESPONSE SYSTEM



**Figure 2.** *Stress response system*

## CYBERCHONDRIA AND METACOGNITION

Metacognition is an awareness of one's own thought processes and an understanding of the pattern behind them. Psychopathology behind altered metacognitive behaviour resulting in 'cyberchondria':

1. Selective attention or Selective focus on body sensations - The way we focus on a symptom can easily amplify our experience of it. The more we pay attention to a symptom the more intense it seems to be. This thought leads to a vicious cycle of anxiety.
2. Unhelpful thoughts or beliefs about health and illness - Repetitive worried thoughts mean that your mind is always filled with a concern for something. The probability of victims overestimating their health anxiety that they have a serious illness is underestimated.
3. Suppressing such repetitive thoughts leads to a 'rebound effect', which can make the



experience more prominent.

4. Repeated checking and reassurance seeking - For eg: Frequent breast examination, and repeated puncturing of acne pustules. People with health anxiety after internet seeking will engage in more and more checking behaviours, which may lead to:
  - False positive diagnosis.
  - Increase doubts in a positive feedback fashion.
  - Can create symptoms such as repeated squeezing and pressing produces tenderness which might be misinterpreted as a serious health issue.
  - Also, individuals with health anxiety fail to feel reassured. Due to this pattern of thought process in victims, cyberchondria is also studied as a digital version of obsessive compulsion disorder (OCD) nowadays.<sup>16,17</sup>

## **PERCEPTIVES**

**WHO?** A] Adults - They seek mainly 2 types of information. Either for the purpose of healthy lifestyle or for the purpose of prevention or awareness of any acute/chronic- infections/diseases. B] Middle-aged - (people diagnosed and or/ on treatment for any particular disease) desire for greater understanding, clarity confirmation and to gain in depth knowledge about health issues, risks and further course enquiry of ongoing treatment. C] Older people - Only when traditional or routine health services fail to treat the primary cause.<sup>18</sup>

**WHY?** Individuals find it more suitable and self-awareness covers a huge amount of information and helps to form aid groups. Foremost importance is given to the ease and pace of obtaining information anytime and from any location. It also attributed to the restricted doctor-patient interaction time during the consultation. Doctors do not elaborate on certain health issues, or patients will not be satisfied by the doctor opinion or conversation during consulting hours. Henceforth, during such a scenario, patients adopt the internet as a more expanding reviewer and explainer of health information they seek.<sup>19</sup>

**WHAT** are the limitations of Google doctor's search clinic? It may escalate one's apprehensive feelings towards health. It may lead to delays in seeking health professional services. It may misdirect and it may speed up or worsen the existing health condition. Past history of the individual's health will be unknown to Google Dr.<sup>20</sup>

**HOW** do victims reflect the available information? They may use the information obtained to challenge advice given by health professionals. They may unnecessarily demand needless investigations and clarifications regarding treatment advice given by doctors. Doubting the efficiency of a professional specialist's decisions.<sup>21</sup>

## **IMPACT**

While searching for one particular issue, people may find some third confounding factor as interesting and the search engine route will be diverted to partway in seek of further indepth hunger for popped up a related issue, regardless of its need for the cyberchondriac person. This will further lead to either 'Catastrophizing nature' i.e. jumping to the worst possible conclusion, overestimating the probability of something or underestimating your ability to cope and/or 'Intolerance of uncertainty,' i.e. not feeling comfortable unless you get a definite explanation, for the searched information.<sup>22</sup>

### **How to treat cyberchondriacs on a clinical basis?**

Cognitive behavioural therapy (CBT) - It focuses on challenging and changing one's thoughts, beliefs and behaviours improving emotional regularity. It also focuses on the development of personal coping strategies that target solving current problems. In daily practice, CBT sessions should be implemented by doctors with their patients presenting with repeated cyberchondriac behavioural episodes, but the doctor needs to be flexible and willing as an authority figure.

“Stress inoculation training” is a major part of CBT which uses a blend of cognitive, behavioural and certain training techniques to target the stressors of the victim. The main agenda -is that the patient learns how to categorize problems into emotion-focused or problem-focused, so that they can better judge their perceptive situation. This ultimately prepares the patient to eventually confront and reflect upon their current reactions to stressors before looking at ways to change their reactions and emotions to their stressors.<sup>23</sup> Acceptance and commitment therapy (ACT) - Uses acceptance and mindfulness strategies mixed in different ways with commitment and changing behavioural strategies to increase ‘psychological flexibility’. ACT invites people to open up to unpleasant feelings and learn not to overact to them.<sup>24</sup>

*Single thought record*- Therapists help their clients to overcome their cognitive biases and think differently. *Decatastrophize* - It is a cognitive restoring technique to reduce or challenge catastrophic thinking. *Stop reassurance seeking* - Vaughn says - ‘The best and most helpful therapy for families to do is not provide reassurance’. Patient’s family or friends need to understand and support the idea of reassurance is not the permanent treatment for cyberchondria. *Follow avoidance and safety behaviours* - People with health anxiety behaviour should try to avoid things that cause them to feel anxious. Eg, can avoid things which remind you of health or illness, such as hospital visits, TV shows referencing health-related issues, visiting ill people etc.<sup>25</sup>



**Figure 3.** *Unnecessary threat received by the brain from Dr Google*

## CONCLUSION

Most doctors today expect patients to come to their clinics with a stack of printouts and an abundance of needless information about their signs and symptoms. Henceforth, consulting doctors first and foremost should know how to approach cyberchondriacs. Being dismissive of their enthusiasm will only frustrate them and sometimes may even make them angry, which will spoil your long-term built a doctor-patient relationship. So, let them express their concerns, however unsubstantiated they may appear! Give some extra time to explain to them what internet can and/or cannot do in health-related search engines. Explain how to distinguish the credible and non-credible medical data displayed. Simultaneously psycho education plays an essential part in remodelling the patients' thought approach and decisions before their consecutive visits.



Open access to complex medical information may alter the traditional role of doctors as the conventional gatekeepers of knowledge and diagnostic expertise. However, can “Dr. Google” undertake to abide by one of the main tenets of the Hippocratic Oath i.e., ‘Premium non nocere?’...

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## **CONFLICT OF INTEREST**

The authors have declared no conflict of interest.

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