

“A man who was a hospital”

## CYBERCHONDRIA: ONLINE HEALTH INFORMATION AND ESCALATION OF HEALTH ANXIETY

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### ABSTRACT

*World Wide Web provides massive amount of health oriented information. The inclination of using internet to get information on health is also all-embracing. Particularly women are found to be the heavy users of online health information (OHI) both for ‘Curative health information’ (CHI) and ‘Preventive health information’ (PHI). This trend is reported to escalate in pandemic like situations due to many factors including increased dependency on online sources. Online health information helps people to have an idea of the health issues and diseases which they probably can be diagnosed with on the basis of their symptoms. Additionally, it can also assist people to have a better understanding of health and illness and provide them with possible explanations for symptoms. Contrariwise, using symptoms as indicators leading to online search can also have undesirable consequences, for example; increase in the anxiety in people. This phenomenon is called cyberchondria, which has recently gained substantial attention from scholars in health communication field. From among the other featured variables in studies on OHI, eHealth literacy is a significant one. There is a huge amount of literature available on established relationship between eHealth literacy and certain aspects of OHI including trust. However, the aspect that how and to what extent factors (eHealth literacy, age and health status of the user) can marginalize the Cyberchondria effects has had little scholarly attention. This study attempts to fill this gap. A survey from 1000 female users of OHI measured eHealth literacy using eHEALS scale and the relationship between the selected variables. Results showed insignificant positive association between ehealth literacy and Cyberchondria (Kendall’s Tau-b= 0.044, p-value=0.294) at 5% level of significance. Negative insignificant association was observed between age of respondents and cyberchondria (Kendall’s Tau-c= -0.057, p-value=0.123). Similarly, the association between health status of respondents and cyberchondria was also found insignificantly negative (Kendall’s Tau-c= -0.065, p-value=0.081). The study showed that eHealth literacy was not found to have association with cyberchondria among users whereas; it established the association of age and health status with cyberchondria. Although the difference was found in direction and signigicance of this relationship.*

**Keywords:** Online health information (OHI), eHealth Literacy, Cyberchondria. Online health research (OHR).

### INTRODUCTION

We are living in an era of information revolution and the quantity of health information available online is enormous. Thousands of results are generated when the consumer types in Keyword; the most common search technique. While seeking relevant information from this incredulous amount (Brodie et al., 2001), this simple technique can generate thousands of results. The availability of this massive

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amount of information however has troubled consumers. Many explanations of the increased usage of internet as an information source, including health have been reported. From among these reasons, quick and cheap access of internet anywhere and at any time tops the list, which in turn has boosted the use of internet as HIS. The technological advancements and internet packages offered by telecommunication companies have accelerated its usage. The overwhelming and constantly increasing trend of using internet by people reflects of it becoming more essential to reach to demographics like adolescents, replacing the use of conventional technologies (e.g. telephones, television) with this new medium\*. Also those segments of population that are changing their interaction patterns with health care experts also need to be focused on (Andre Picard, 2010). Besides, the trend of using online health information is emerging due to its availability and accessibility. According to reports in the year 2000, roughly forty percent of adult Americans, (Baker et al., 2003) and twenty five percent teenagers (Lenhart et al., 2001) used the Internet to access information about health. Amanda, also quotes a 2008 survey which found 86 percent of participants as a regular user of the Internet for OHI.†

To seek advice and knowledge about health related issues is the main gratification which people intend to seek from online sources. Many researchers have looked into how people with heart disease and breast cancer consult online health sites for advice. Many first time mothers also get help from online sources for their babies' health and diet related concerns (Baker et al., 2003). For many, internet is replacing the doctor as their primary information- source for health issues (Tonsaker et al., 2014 & Hesse et al., 2005). Furthermore, online health information is said to have the power to significantly affect consumer attitudes and behavior (Ybarra & Suman, 2006).

This increased usage of OHI for the diseases and healthy life style has expanded as a result of technological advancements that have amplified the ease of access to World Wide Web. From the perspective of Curative Health information (CHI), including diagnosis and medical help, this access to reliable online health information (OHI) has been reported beneficial for the users in many ways. It includes anxiety-reduction (Arora et al., 2002), increased sense of self-efficacy and decrease in the utilization of ambulatory care (Killen et al., 1989). Some other reported benefits of OHI have also been stated such as assisting people to improve health- related self-care (Fox & Rainie, 2000) and help them to have a better comprehension of their health concerns (Baker et al., 2003). Similarly, the use of internet to acquire information for preventive- health purposes, called PHI is also on the rise. PHI includes healthy life style, exercise and physical activities, and dietary information. The reasons of this increased use of internet as an information-source of health and online health services include, (a) it is accessible to everyone, everywhere, (b) information retrieval is quick and easy (Tonsaker et al., 2014) and (c) the content, channel and creator of content are interactive in nature (Kim et al., 1999). The increased availability of content from a number of sources has resulted from the digitalization of communication and the involvement of people with specialization in different professions. These factors have enhanced people's reliance on new media technologies.

Internet has been identified to serve numerous functions as a source of health information. Researchers, however, have made three major categories of these functions, which include *Content* (i-e seeking for health related information), *Community* (i-e taking part in an online support group (Cotton & Gupta, 2004) and *Commerce* (i-e purchasing medicines or vitamins online (Eysenbach, 2009). Some other significant aspects that have attracted interest in internet as HIS include, the role of the internet as HIS, predominantly for those who are unwell and the comparison of internet with other media (Eysenbach, 2009 & Raupach, & Hiller, 2002). Many have focused the consumption of internet as HIS by individuals with specific disease such as lung cancer (Peterson & Fretz, 2003), prostate cancer (Smith et al., 2003), or health problems such as pediatric information by mothers (Bernhardt & Felter, 2004). The motives for using online sources for health information have also been studied (Brashers et al., 2006). According to the results, there was a substantial number of people i-e 91% who were looking for information for a particular sickness and 26% for psychological sickness (Rice, 2006). While some studies have explored intensity of involvement in online communication activities associated to health,

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\*Hesse et al., (2005); Hu, Bell, Kravitz, & Oorange,( 2012). Report that health consumers regularly consult the Internet to supplement health information provided by their physicians, who are viewed as a trusted source for health information.

others have tried to seek the effects that demographics, health status and sickness experience cause (Atkinson et al., 2009) on the perceptions and practices of users regarding health related information.

Researches on health communication have reported a significantly higher ratio of both the usage of online sources and consumption of acquired information in women as compared to men (Fox & Rainie, 2002 & Shen et al., 2017). Women are found more anxious about their well being and are dynamic users of the preventive and curative health related services. Their use of internet as HIS is to find information that may help to safeguard them from diseases as well as the nutritional values of recommended food and physical retreats. The report of World Health Organization (WHO) on “*women and health*” (2009) has identified many reasons of this higher usage among women which includes (a) gender discriminations, especially in developing regions like Asia, (b) conditions such as pregnancy and childbirth that are related to women only and can have significant effects on their physical health, (c) lack of health facilities in low income countries like Pakistan, (d) Social and economic factors that result in limited access to medical and health-related facilities, and (5) Cultural and Social taboos, due to which females and specifically young girls avoid sharing their personal health issues. In such circumstances, the internet turns out to be a useful substitution to conventional sources of health related information for them. Furthermore, the element of confidentiality and accessibility at all times (wherever a net connection is available) are also potential incentive for using internet as HIS.

Added factor that enhances the OHS among women is their traditional role of caretakers. Women as users of OHI consult multiple sources than men (Rowley et al., 2015), exhibit great trust in OHI, have feeling of being more special and get greater satisfaction in a computer mediated communication (CMC) environment as compared to face-to-face communication (Lind, 1999 <https://ieeexplore.ieee.org/abstract/document/807966>). Furthermore, they are also reported to make high usability of OHI (Bidmon, & Terlutter, 2015) and on average possess high eHealth literacy as compared to men (Corrarino, 2013).

During specific conditions like pregnancy and intimate health concerns, women consult many OHIS, like discussion forums, websites, blogs, health apps, and social media (Lupton, 2016) in order to seek support and connect with others experiencing similar health problems. Furthermore, it is also helpful for people with similar backgrounds to interact (Chu et al., 2017). Some of the main reasons of this increased and frequent use of OHI among women include more engagement, increased acceptance of Web 2.0, a great extent of society-driven motive and gratification. The above-mentioned factors trigger the usage of internet for consulting health issues among females (Bidmon & Terlutter, 2015).

Despite the fact that internet is a significant source of health information, there are still inequalities in access to OHI. This source does not appear to benefit all consumers equally. The potential use of internet as HIS demands the fulfillment of certain requirements by both the source and the consumer. To get the most out of OHI, users should acquire proficiencies in accessing, understanding and evaluating the source. This expertise or ability called eHealth literacy, have gain substantial attention of researchers in the area of health information. eHealth literacy has its roots in health literacy and refers to the ability to search for, locate and assess information via electronic sources to deal with health issues and make decisions related to one’s health (Norman & Skinner, 2006). eHealth literacy not only benefits the users but is also found helpful in increasing the effectiveness of Health information sources (HIS) (Monkman & Kushniruk, 2015).

Although eHealth literacy enables the user to find trustworthy information, an association between anxiety-reduction and eHealth literacy has also been identified (Gustafson, 2002). Greater sense of self-worth, and reduction in utilization of outpatient medical care (Robinson, 1989), help people to manage /handle/ look after and take better care of themselves (Fox, 2000). Also increased understanding of problems related to their health (Baker, 2003), are some other reported benefits of eHealth literacy. Studies have sought the role played by eHealth literacy in internet's adoption as a source of health information (Deursen & Dijk, 2011), connection between eHealth literacy and access of OHI, source credibility (Neter & Brainin, 2012; Norman & Skinner, 2006) interpretation of health behavior suggestions or assessment of health information resources in terms of the quality (Benotsch et al., 2004) and perceived trust (Ye, 2011) of OHI.

Realizing the significance of eHealth literacy, it becomes essential to study the construct. On the other hand, details about what impacts specifically the psychological ones, the acquired information has on users, was found to be a significant yet unevaluated aspect of the growing e-health movement. Although internet is exceedingly popular as a source of health information around the world, but treating

OHI users as homogeneous population appears unreasonable. It is not appropriate to ignore demographics of the users because demographics cause differences in expectations and use of internet. These differences may decrease the efficacy and significance of internet as source of health information: “The users, therefore must be clustered into groups while studying” Dutta- Bergman (2003). Keeping in view this perspective, studies on OHI have focused on personal and social characteristics of the consumers of OHI, particularly in connection to their expectations from these sources, their information seeking patterns, and eHealth literacy.

One significant area of interest for the research in health communication, therefore, has been the study of audience with specific characteristics. In their study, Ybarra & Suman (2006) analyzed individual characteristics of those who were motivated to seek medical help after seeking health related information on the internet. The differences in the requirements and demographics of both the health seekers and support seekers were sought. Age, race and gender all contributed to the differences in health information demands and usage of internet. Additional factor that contributes towards the utility of OHI is the attitude of the user towards it, which is impacted by personality traits. These individual differences influence peoples’ information seeking behavior, which is particularly apparent when they are faced with unclear and distressing circumstances such as a significant health problem or suffering from some disease. In this context, EK & Heinström (2011) emphasized two attitudes i.e. locus of control and sense of coherence while studying the interaction between individual differences and patterns of information seeking regarding health in people with varying degree of health status. The results of their study established that personality traits affect not only the attitudes but also the information seeking behavior. Great *external locus of control* and *lower motivation* to take action on health issues, for example, was found in people who believed to have health issues. Their findings confirmed the contribution of personality traits towards attitudes and patterns of OHI seeking.

When researching health data, scholars and researchers have concentrated on specific groups of population. While Warner & Procaccino (2004) determined the needs and the patterns of health information seeking among women in the perspective of the source- credibility, Castrén et al.’s study (2017) focusses on young adults as consumers of OHI. Surprisingly no correlation between health status (as perceived by the respondents) and demographics i-e gender and education, was found in comparative analysis of users and non-users of Finnish student’s health service. In another study that compared health information sources (HIS), Claudia J. Gollop included the participants on the basis of age and gender. The study intended to seek the association between needs and source- preference from among conventional HIS (health practitioners, close people, library and mass media). The findings showed that the selection of a source for health information by older African American women was based on needs and demography i-e self-perceived literacy, education, age and ease of access. A correlation was also noted between acquired education and selection of the source. It was observed that those with high literacy primarily used Newspapers and Magazine for health information, while young respondents with higher education resourced library most often to get health information. Studies in all the areas of human life including communication have highlighted gender as a significant variable. Surprisingly studies in Health communication, however, were found with a shortage of gender perspective. Gabbard-Alley (1995) was doubtful about the results of several studies on health communication. He had reservations and doubts based on the improper research plan and methodological approach. His study therefore focused on a particular gender i-e female. Age was the other factor that was focused on to seek the trust interaction with OHI. The age difference study signified whether people utilize internet to look for OHI (adopters) or don’t (non adopters). As a result, young-age users built a more trusting and easy relationship with OHI because they were early adopters, but older age folks (non adopters) were less active in seeking OHI despite having more health difficulties. This difference grew in significance with age (Lisa-Miller, 2011).

The internet is a provider of plethora of information on health conditions and the advantages of OHI are numerous. However, this practice holds disadvantages, too. OHS particularly becomes an obsession when the information is excessively consumed for self-diagnosis, based on the symptoms. Although the use and significance of internet as HIS is on a constant rise, this, however, may cause potential harm to users particularly when it is used as a diagnostic tool (Aiken et al., 2012). This potential for harm and risks increases due to over-consumption. One of the reported negative consequences to easy access and over-consumption is Cyberchondria.

While facing some health issues, it can be taken as a normal behavior to monitor one's symptoms, search for the relevant information and consult the medical expert. However, the consequences can be problematic and significantly negative when individuals excessively practice these things out of their anxiety. Due to the increased frequency, and extended time for seeking information from internet regarding health concerns, people may embrace the huge amount of health information. This phenomenon called, Excessive reassurance-seeking may cause unintended effects like increase in anxiety. Thus excessive use of internet particularly for diagnosis becomes a problem, instead of a solution. Hypochondriasis has been linked to a greater desire for diagnostic explanation, suggesting that there is no such thing as too much health information, even if it comes at the price of higher distress (Osborne & Williams, 2013).

Studies consider Web search as an inappropriate source of information if used as a diagnostic tool, (Aiken et al., 2012) particularly when people avoid doing the verification of key standard parameters of quality like, source validity and the date on which source was created (Pew Internet and American Life Project (Online health search, 2006). Further studies have also identified the potential for harm and risks of over-consumption of internet. The information available on the internet is generalized and less specific, without giving consideration to essentials like differences in age, lifestyle and gender etc. (White & Horvitz, 2009a and White & Horvitz, 2009b). Consumers, while searching health information from online sources, have also reported a higher level of anxiety or stress. The excessive or repetitive OHR in addition to this increased anxiety causes Cyberchondria (Starcevic, & Berle, 2013).

Cyberchondria is a term used for health-related internet surfing. This syndrome-like entity has its base in Hyperchondria or health anxiety and refers to the consumer behavior related to OHI among users. While some have defined cyberchondria as simply being a type of health anxiety (Starcevic, 2017), others consider it an ailment that contains several dimensions (McElroy, & Shevlin, 2014). Other than health anxiety, Cyberchondria has also been related to Problematic internet use (PIU) and Obsessive compulsive disorder (OCD) in many studies. Experiencing certain symptoms pushes people to the fear of having some health issue or disease and ultimately to turn to online health sources to relieve their anxiety or to seek reassurance (Gordon Asmundson). Initially seemed to be gratified, this need of reassurance returns after some time, thus trapping the consumer in a vicious cycle of searching health related information from internet and other available sources. This ultimately causes increased health anxiety. The first systematic study on Cyberchondria was conducted by White & Horvitz (2009), who did an extensive review of search outcomes and available literature on health related web search, and came up with the definition of Cyberchondria as, "an unsubstantiated increase of concerns about common symptomatology" (PROVIDE REFERENCE HERE). The researchers explained the phenomenon that when people who do not have medical know how or have little knowledge of medical field, use internet for diagnostic purposes, their anxiety increases.

People with health anxiety may delve into the vast amount of health information available on the internet, which is sometimes regarded as a "problem", that is, as overwhelming and anxiety inducing. The abundance of knowledge available on the internet may also contribute to cyberchondria. The possibility of finding information with an ideal explanation for everything cannot be denied. All it requires is the continuous search, regardless of the anxiety caused during the search. In other words, the positive outcome may be a justified explanation of the process that caused anxiety. The ultimate reward of this process, i-e a complete or perfect answer is the gain at the end but by paying the price i-e the reinforcement of cyberchondria. This idea is supported by the fact that many hypochondriacs possess characteristics of being perfectionist and other symptoms of OCD (Starcevic & Berle, 2013).

Cyberchondria may cause certain undesired consequences as it may hinder or postpone the pursuance of personal medicinal assistance by those who need it. Since, people with Cyberchondria prioritize to seek information over other activities, they start to neglect their domestic and professional responsibilities and activities. It has also been reported to have adverse effects on relationships and social life of those suffering from it (27-Aug-2020 Wikipedia).

#### **History and Theoretical foundation**

Although, the term Cyberchondria initially appeared in journalistic articles (Starcevic, & Berle, 2013) the scholarly work was done by White and Horvitz in 2009. Their articles are regarded as the landmark that laid foundations of the mechanism for further academic research in the area. The first tool to measure cyberchondria, the Cyberchondria Severity Scale (CSS) was developed by McElroy & Shevlin

(2014). Beside the extensive usage, the development and validity of the scale has also been emphasized by many (McElroy & Shevlin, 2014). The scale therefore is modified and reliability checking of different versions of the scale has been introduced (Uzun, & Zencir, 2021). For instance the Turkish version, (Bajcar, Babiak, & Olchowska-Kotala, 2019), The Polish adaptation, (Barke et al., 2016), and German validation and development of a short form of CSS (Bajcar et al., 2019) etc.

Initial studies on Cyberchondria were based on Reassurance-seeking model. This model proposes the greater probability of the users with more health apprehension to do OHR because they are in need of reassurance for their health concerns. Nonetheless, due to its nature, internet does not turn out to be a source of reassurance for all. Those, who do not get their need of reassurance fulfilled or partially fulfilled, need of reassurance is not gratified, get more /become more concerned and keep on looking for/ involved in OHR for reassurance. This lack and absence of reassurance coupled with some other factors like, Furthermore, due to some other factors like the need / expectation of user to get a perfect explanation as a result of OHR, availability of excessive information, a natural feel of uncertainty while searching OHI, and source credibility This creates a vicious cycle (Curr Psychiatry Rep, 2020). The other, most extensively used common model of meta-cognitive beliefs is that posits relationship between pre hold beliefs of the user and effects of OHR for reassurance including cyberchondria. This model divides the outcomes of OHR into two broader categories i-e Compulsive OHR, based on Negative metacognitive beliefs and causes cyberchondria and Problematic OHR based on positive metacognitive beliefs i-e reassurance. An obvious and strong association between reassurance seeking need (or OHR based on positive metacognitive beliefs) and Health anxiety has been found. Whereas compulsive OHR is based on negative beliefs is related to PIU (Brown et al., 2020). Theoretical foundations of current study were based on Reassurance seeking model.

EHealth literacy has been found a strong predictor of both the usefulness of and perceived trust in online health sources. Furthermore, Cyberchondria and personality characteristics like Obsessive Compulsive disorder (OCD) and being perfectionist have also proved to be linked. The association between eHealth literacy and Cyberchondria, however, is unaddressed yet and needs to be discovered. The extent to which eHealth literacy may affect the degree of being cyberchondric for a consumer of OHI and role of demographics and personality trait in this regard are the main concerns of this study. Studies in the field of health communication have mainly focused on needs, consumptions, and advantages of online health information. Little attention has been gained by the psychological impacts of the access and increased use of online health information on user (R., 2001).

The reasons behind seeking online health information may vary due to certain factors among which health status is a major determinant. For example, people suffering from some severe illness or chronic disease frequently seek information to have a better understanding of their diagnosis, to make decisions on treatments, and to foresee the effects of their diseases. On the other hand, people having good health status, search for information that may help them understand risk factors and to learn of precautionary measures in order to maintain good health (Goldsmith, 2002). Difference in needs and motivation for seeking health information is largely dependent on the health status of the user.

The major objectives of this study, therefore, were to explore the association between eHealth literacy and Cyberchondria among Pakistani female users of online health sources. It further intended to find out whether age and health status affect the degree of cyberchondria or not.

### **Objectives**

The study aimed to achieve following objectives,

- To assess the eHealth literacy of female users of OHI
- To seek the connection between eHealth literacy and Cyberchondria
- To find out relationship between age and Cyberchondria
- To find out association between health status and Cyberchondria

### **Research Question**

- Is there any association between eHealth literacy and Cyberchondria?
- Do socio-demographics (age, health status) correlate with Cyberchondria?

### **Hypotheses of the Study**

- H0 There is no association between eHealth literacy and being cyberchondric among users of OHI.  
 H1 There is association between eHealth literacy and cyberchondria in users.  
 H0 There is no association between the age of the female user of OHI and cyberchondria.

- H2 There is association between the age of the female user of OHI and cyberchondria.  
 H0 There is no association between the health status of the female user of OHI and cyberchondria.  
 H2 There is association between the health status of the female user of OHI and cyberchondria.

**RESEARCH METHODOLOGY**

To seek answers to research questions and test hypotheses, data was collected from the female users of OHI. Sampling frame consisted of the registered students of public sector women universities in Pakistan. eHealth literacy level of respondents was measured through eHEAL scale whereas presence of cyberchondria was identified by asking four items designed by Amanda Gordson. The respondents were asked to respond on a five point likert scale (1=Not at all to 5= Very often) to the statements that determine the presence of Cyberchondria.

**Sampling**

Multi stage sampling was done. From among Women Universities in public sector that are HEC recognized, following were selected randomly;

- Govt. Sadiq College University Bahawalpur.
- Fatima Jinnah University, Islamabad
- Lahore College for Women University, Lahore.
- Women University Swabi, and
- Sardar Bahadur Khan University, Quetta.

Later sampling proportionate to population technique was used and data was collected from respondents from each selected university proportionate to total enrolled students in that particular university. Further, stratified sampling helped the researchers to decide number of the respondents to be included in the study from different levels i-e under graduation, graduation and post-graduation level.

**Tool of data collection**

A questionnaire comprising of the following two sections was designed;

1. Questions related to eHealth literacy (Adopted from eHEAL Scale)
2. Structured and pre-coded questions to measure Cyberchondria (Adopted from Amandus Gordon)

**Socio Demographics**

In present study Socio demographic characteristics measured were: (a)Age (Group 1: 15 -20 years, Group 2: 21-26 years, Group 3: 27 and above, and (b) Self perceived Health status (Group 1: Good, Group 2: Satisfactory, Group 3: Poor)

**eHealth Literacy**

eHEALS, a widely used rating scale was adopted to measure the eHealth literacy of the users. The respondents report their competence and awareness of OHI by self reported efficiency in terms of search, access, comprehension, and usage of the acquired information to solve health problems and make health decisions (Norman & Skinner, 2006).

**RESULTS**

**Statistical Analyses**

SPSS Version 25.0 was used to figure out the association between eHealth literacy and socio demographics i-e age and health status. To determine the statistical significance value of  $p < .05$  was decided. To test Hypotheses that assumed to have the association of eHealth literacy, age, and health status with cyberchondria, Kendall tau was used. The reason to use this test was its appropriateness to measure association between ordinal quantities.

**Results (Kendal tau) Association between demographics and cyberchondria**

**Table No. 1 eHealth Literacy and Cyberchondria**

	Low effects (%)	High Effects	P	Test Statistic Values
<b>eHealth literacy</b>				
Low eHealth Literacy	284 (28.4%)	156 (15.6%)	.294	.044
High eHealth Literacy	344 (34.4%)	216 (21.6%)		

Insignificant positive association can be observed between e health literacy and cyberchondria (Kendall's Tau-b= 0.044, p-value=0.29) at 5% level of significance. As level of ehealth literacy increases, effect of cyberchondria increases.

**Table No. 2 Test of association between Age and Cyberchondria**

	Low effects (%)	High Effects	P	Test Statistic Values
<i>Age</i>				
15-20 Years	336 (33.6%)	212 (21.2%)	.123	-.057
21-25 Years	274(27.4%)	146(14.6%)		
26 and Above	18 (1.8%)	14(1.4%)		

Statistical analysis came up with negative insignificant association between age of respondents cyberchondria (Kendall's Tau-c= -0.057, p-value=0.123). As age increases effect of cyberchondria decreases.

**Table No. 3 Test of association between Health status and Cyberchondria**

	Low effects (%)	High Effects	P	Test Statistic Values
<i>Health Status</i>				
Poor	42 (4.2%)	20 (2.0%)	.081	-.065
Average	236 (23.6%)	176 (17.6%)		
Pretty Good	350 (35%)	176 (17.6%)		

Insignificant negative association can be observed between health status of respondents and cyberchondria (Kendall's Tau-c= -0.065, p-value=0.081) at 5% level of significance. As health status improves, effect of cyberchondria significantly decreases.

**ANALYSIS AND DISCUSSION**

The study aimed at exploring the association between eHealth literacy and psychological effects of the OHR in the context of new media. Furthermore, it intended to know the extent to which age and health status affect the psychological effects of OHI called Cyberchondria. The findings did not come up to support to the hypothesized association between eHealth Literacy and Cyberchondria. Although eHealth literacy has been reported a strong predictor of the perceived trust in Online health information (OHI) and usability of online Health information Sources (HIS), when it comes to Cyberchondria, other strong predictors like usage, health anxiety, and age seem to have more potential to marginalize the role of eHealth literacy. One of the possible interpretations of these findings can be found in greater consumption and dependence of young people on new media technologies. Due to the advancement in both hardware and software, the individuals can not only learn but also increase their proficiency in the usage of these technologies on their own. Users can become skilled in the use of these information sources even without any formal learning and with time can also excel. Thus to seek, get access to, analyze and select the needed information seem to have become convenient for users over time. Therefore, the young age user and even those with low education level may acquire high eHealth literacy. However, moderating variables can marginalize the role of eHealth literacy in preventing the users from being cyberchondriac.

The results have established a strong negative association between age and Cyberchondria. As the age increases, the probability of being cyberchondriac decreases. The higher ratio of the presence of Cyberchondria among younger age groups and those with poor health status seems quite logical. Usage of internet has been reported to be higher among young age users. Similarly, the adolescents' state of relative health 'information poverty' as compared to adults has also been reported, which is another reason for their increased dependence on online sources and being more vulnerable to the effects of OHI. Particularly in developing countries like Pakistan, young people are known to have difficulties in their access to conventional health services. Conversely, they are heavy users of Internet which has

become the most appropriate alternate source of OHI for millennial and Generation Z. Young people in general also have carefree attitude and do not verify the trustworthiness of searched information and credibility of the source. This attitude increases the probability of accessing unauthentic or irrelevant information which makes them more vulnerable to have negative psychological effects of OHI.

Taboos associated with certain health issues in traditional societies is another reason for both the high usage and ultimate consequences like Cyberchondria among young people. Health issues particularly intimate health issues are not encouraged to be discussed in societies like Pakistan. Furthermore, sensitive issues like information on contraception and mental health are also difficult to be discussed under personal or one-to one communication due to social taboos.

With special reference to females and especially young girls, presence of communication gap in general and specifically in the context of health issues is evident. Numerous academic papers regarding the health communication manifest this. Noe and et al., for instance assessed the communication barriers towards Sexual and reproductive health SRH issues among mothers and their adolescent girls in their study (Noe et al., 2018). They conducted in-depth interviews using semi-structured questionnaire with mothers and daughters and found that half of the respondents had negative perceptions of communication on SRH issues. Only 2.7% of girls discussed SRH issues with their mothers more than four times in a period of six months, due to socio-cultural taboos (Noe et al., 2018).

Similarly, an exploratory focus group on young female university students revealed that there is a communication gap between daughters and mothers in discussing intimate health issues (Gray et al., 2005). In such circumstances, internet is reported to be a place that provides a stigma-free environment to the users. Internet is not only a source that possesses the combined characteristics of all other sources (both conventional and professional), but is also assumed to be confidential and a source of easy access to an unparalleled level of information about variety of subjects particularly among young-adolescents (Gray et al., 2005).

Data in present study was collected from students. This is natural that the exposure and maturity level increases with age and education, though not equally and on standard level. Previous studies have also come up with similar findings.

These findings are in accordance with the results of the study by Asgher et al. (2020) where participants of focus group that comprised of young age reported to have more psychological effects of exposure to OHI that included Fear, Anxiety, and Depression. Similarly, one focus group in a qualitative study on the health information-seeking behavior in adolescence was found as being aware of the 'cyberchondria' phenomenon (Nicola et al., 2005), that could lead to wrong diagnosis and unnecessary anxiety about personal health. Following is one of the comments which the researchers have quoted in their discussion,

“By the time you’ve finished, they’ve convinced you that you’ve got leprosy and five kinds of cancer”, this phenomenon has been previously presented in a humorous article by Jerome K. Jerome titled “*A man who was a hospital*”. Though the writer has described his personal experience in this essay but with reference to conventional means of health information sources, it seems quite relevant to Cyberchondria and OHI. While reading a circular on some liver pill, the writer suspected his liver was not functioning properly. To get more information about liver diseases, he visited British Museum. Studying more about the disease not only confirmed his fear of having an out of order liver, but also made him believe that he was suffering from all the diseases (except house maid-knead) written alphabetically in the book. Long story short, when he visited the doctor and described his whole situation and concern, the main advice in prescription was “*Don’t stuff your head with things you don’t understand*”.

On the basis of above discussion, summarized reasons for negative association between age and cyberchondria may include; increased exposure in age consequently resulting in mounting experience, self-confidence, power to take decision, access to health resources and less consumption of CMC. Like age, health status is reported to be determinant of attitude towards OHI and effect on health behaviors. Health anxiety causes tremendous uncertainty for people with poor health. More over, information acquisition, which is directly tied with interpreting the situation and deciding whether and how to respond, and whom to contact for guidance is one strategy to deal with confusion and anxiety (Suh et al., 2004). Therefore, the probability of the users with health issues or reporting to have poor health status is expected to be higher in seeking health related information as compared to those with good health. On the other hand, people with satisfactory and good health will be in search of PHI. This

difference in needs and motivation to seek OHI among users is determined by health status and consequently the consumption and effects are also different. The use of media for gratification of needs may cause the unintended effects as have been stated in uses and gratification theory by Elihu Katz. People with poor health or having health issues feel anxiety and are in need of reassurance, which is the initial stage that leads to the vicious cycle of cyberchondria. Doherty-Torstrick, Walton, & Fallon, (2016) in an online survey also found the severity of illness anxiety as a cause of online symptom searching and an association between intensity of illness anxiety and aggravation in anxiety as a result of reassurance –seeking from online sources . Longer duration for online health-related use was associated with increased functional impairment, less education, and increased anxiety during and after checking (Doherty-Torstrick et al., 2016).

The trend of OHR for diagnosis purposes is also reported to be higher. According to a study every third US adult regularly uses the internet for self diagnosis regarding health related worries (Fox & Duggan, 2013). It was particularly found popular among patients who were in urgent need of information, needed prompt response to their queries and were looking for emotional support regarding common health problems. Their practice to use internet was to deal with and handle health issues on day-to-day basis (Fox, 2011). The users with poor health are in more need of health related information as compared to those with satisfactory and good health. Furthermore due to their health issues, they are more likely to consult online sources for diagnosis, reassurance and other needs like curative health information (CHI).

The study concludes that individual differences in health information behavior must be better understood in order to improve practices related to health information and providing services that offer individually tailored information. As a result, the individual in need may feel better and healed. Furthermore, it may also lead to reducing the probability of undesirable consequences including Cyberchondria.

## CONCLUSION

None of the selected variables i-e eHealth literacy, age and health status has significant association with Cyberchondria. This identifies the need to find the role of other factors, in determining Cyberchondria among users. More studies are required to confirm these associations and to resolve the ambiguities and contradictions surrounding cyberchondria. Future research should examine existing and innovative theoretical frameworks and conceptualizations. To establish the importance of cyberchondria within the area of health communication, such research should not just rely on surveys among general public using convenience sampling, but should also focus on special segments of population and experimental methods.

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