THE MODERATION AND MEDIATION MODEL OF HEALTH-RELATED KNOWLEDGE IN ILLNESS ANXIETY AND CYBERCHONDRIA

Aqeel Ahmad Khan[1*], Muhammad Sajjad[1], Allah Ditta[2], Gull Naz Khan[1], Aamir Iqbal[1], Ahmed Ikram[3], Rabia Bashir[4], Bisma Akhlaq[1]

[1*]Assistant Professor, Department of Applied Psychology, The Islamia University of Bahawalpur, Pakistan
[1]PhD Scholar, Department of Applied Psychology, The Islamia University of Bahawalpur, Pakistan.
[2]Principal/Managing Director Sunnat Academy & Counseling Services of Pakistan Mailsi, Vehari - Pakistan
[3]Lecturer, Department of Applied Psychology, The Islamia University of Bahawalpur, Pakistan.
[4]Government Primary School 68 K.B. Saincha Wala Tehsil Mailsi, District Vehari - Pakistan

*Corresponding Author: Dr. Aqeel Ahmad Khan
*Assistant Professor, Department of Applied Psychology, The Islamia University of Bahawalpur, Pakistan. Email: aqeel.ahmad@iub.edu.pk

Abstract

The prevalence of cyberchondria and health anxiety is drastically increasing in the current era of easily accessible online health information, as an increasing number of individuals turn to internet resources to address their health issues. This Pakistani study examined the correlation between health anxiety, cyberchondria, and emotional control. Data about cyberchondria, emotional control, health literacy, and health anxiety were gathered from (N=255) inhabitants using a questionnaire that they completed themselves. The hypothesis was tested using mediation analysis, specifically with Hayes's PROCESS. The findings indicate a favorable correlation between cyberchondria and health anxiety with emotional control ($\beta=0.34**p<0.001$). Moreover, health literacy significantly diminishes the inverse correlation between health anxiety and emotional regulation, as indicated by a beta coefficient of -0.51 ($p<0.001$). According to the findings, health officials should establish countrywide educational planning programs. Engagement in these activities should result in improved health awareness and behaviors. Furthermore, stringent supervision is necessary for internet platforms and websites that disseminate deceptive health information.

Keywords: emotional state, public health, psychological well being

Introduction

There has been a rise in the number of people who obtain information linked to their health through virtual platforms. In recent years, an ever-increasing number of people have begun to get their medical records in an electronic format (Ackerman et al., 2021). Self-diagnosis, which may be done online, helps individuals improve their medical diagnosis. It is unfortunate that conducting research on health-related topics online comes with a few risks (Ahmad &Murad, 2020). There is a correlation between the availability of health information that is available online and the development of anxiety and tension symptoms (Ahmed et al., 2018). An individual who suffers

from "cyberchondria" exhibits serious health problems as a consequence of their obsessive-compulsive disorder (OCD) and their excessive use of the internet (Akhtar& Fatima, 2019). According to a poll conducted all around the world, a sizeable percentage of internet users (varying from forty percent to eighty percent) actively look for information on the internet that pertains to their health (Bajcar&Babiak, 2019). It is essential to keep in mind that not all searches for symptoms necessarily indicate the presence of cyberchondria. To be concerned about one's health is a natural and unavoidable human emotion. There is an excessive amount of tension, and there is a continual quest for information linked to illnesses, which disrupts the everyday routine. According to the findings of Doherty-Torstrick and colleagues, cyberchondria, which is defined as an unhealthy fixation with looking for medical issues on the internet, may lead to a protracted state of acute concern over one's health (Doherty-Torstrick et al., 2016). The behavioral part of cyberchondria, as described by McElroy et al., is characterized by persons actively seeking for information relating to the ailment as a way of relaxing (Finbråten et al., 2018). On the other hand, the emotional side involves people experiencing feelings of dread or anxiety as a result of their study and a general lack of control over their activities (Gao et al., 2020).

A person's state of health has a significant impact on the quality of their life. It is for this reason that the physical and mental health of an individual is a topic of concern for each and every person (Goulia et al., 2010). It is referred regarded as health anxiety when this persistent fear continues to develop despite the fact that the individual has sought the advice of a medical practitioner regarding relaxation strategies. Anxiety over one's health can be characterized as a persistent and strong concern about the presence of significant medical issues (Heizomi et al., 2020). There is a possibility that psychological or physiological symptoms that are quite minor or ordinary might be mistakenly interpreted as indicators of a serious illness. A heightened level of awareness toward publications and advice relevant to health is exhibited by those who are concerned about their individual well-being Mushtaque, Raza, et al. (2021). The existence of a considerable body of evidence demonstrates that there is a strong association between cyberchondria and health-related worries for individuals. In order to alleviate their anxiety about being sick, a number of people are actively searching the internet for information about various diseases and treatments. When you are already suffering anxiety, it is recommended that you restrict the amount of time you spend on the internet for the aim of self-diagnosing issues.

There is a connection between particular feelings and ideas and certain worries and anxieties. Pessimistic cognitive processes and maladaptive attitudes regarding health and sickness are the root causes of elevated levels of health anxiety. Identifying and modifying these behaviors might be challenging because of the recurrent and consistent nature of the behaviors in question. In order to provide an explanation for their conduct, individuals who suffer from health anxiety may look for health dangers in online discussion forums (Raza, Khalid, et al., 2023b). The likelihood of individuals who display cognitive distortions actively searching for and misinterpreting health-related facts is increased, which in turn leads to an increase in the individuals' feelings of concern. It is possible for an individual's emotions to change their perspective, which can result in either increased optimism or increased fear (Raza, Khalique, et al., 2023).

In accordance with the findings of Garnefski and Kraaij, the purpose of "emotional regulation" is to alter the emotional state of an individual by the creation, maintenance, or modification of emotional events (Garfin et al., 2020). In order to properly regulate one's emotions, the capacity to adapt is absolutely necessary. In order for individuals to do this, they need to have a strong awareness and acceptance of their feelings, as well as the capacity to regulate their impulses, retain resilience in the face of negative feelings, and make use of effective tools for psychological regulation (Raza, Khalid, et al., 2023a). The findings of the research conducted by Jungmann and Witthoft indicate that emotional management has the ability to treat cyberchondria as well as health anxiety disorder (Jungmann & Witthöft, 2020). It is possible for challenges in emotional regulation to present

themselves as symptoms such as addiction to digital media and other limitations on functioning. According to Bottesi et al., cyberchondria is associated with problematic internet usage, which may be impacted by difficulty in managing emotions and controlling impulses (Khazaal et al., 2020). Also, cyberchondria is connected to problematic internet usage. Poor emotional regulation has been proven to be associated with activities such as ruminating, catastrophizing, worrying about one's health, and cyberchondria, according to research conducted by researchers. It is possible that searching for information on health on the internet might provide a little reprieve from the unpleasant feelings and thoughts that one is experiencing (Khalid et al., 2023).

People who have health literacy are equipped with the mental and interpersonal abilities that are required to actively seek out, absorb, and respond to information that is connected to health. According to the findings of Mushtaque, Dasti, et al. (2021), Iran is confronted with a severe challenge of poor health literacy. Furthermore, there was a pervasive lack of health literacy in various European countries, which resulted in more than fifty percent of the population being uneducated about the right techniques of maintaining their health. According to Mushtaque et al. (2022) individuals' ability to analyze, depend on, and critique information is hindered when they have poor health literacy (Raza, Khalid, et al., 2023a). Participating in activities that promote good health is beneficial to an individual's well-being and can help them take preventative steps against sickness (Raza, Khalid, et al., 2023a). A few examples include developing a comprehensive understanding of sicknesses, conducting study on health difficulties, participating in regular physical exercise, consuming a diet that is balanced, getting an enough amount of sleep, and cultivating pleasant relationships (Raza, Khalique, et al., 2023). Due to the fact that they reduce the likelihood of becoming ill, improve the quality of life, and make medical treatment more affordable, these characteristics are extremely important (Shehata et al., 2023).

Problem statement, research gap and objectives:
It is the purpose of this research to investigate the connection between cyberchondria, difficulty in emotional control, and health worries among people living in Pakistan, as well as the influence that activities that promote health have on these characteristics. In the context of this particular situation, our purpose is to get a more thorough understanding of the elements that impact the behavior of individuals when they are searching for health-related information online, as well as the emotional ramifications of such conduct. Cyberchondria is impacted by a number of causes, some of which include worries about one's health, difficulties in controlling one's emotions, and a poor grasp of health. Numerous academic studies have been conducted to study a variety of elements that have the potential to reveal the presence of cyberchondria. These factors include health anxiety, emotional management, and health literacy. On the other hand, we have not yet investigated the influence that cyberbullying has on the activities that Pakistani persons engage in that are beneficial to their health. The purpose of this research is to investigate the ways in which the control of emotions affects the relationship between cyberchondria and health anxiety. The study also intends to investigate the ways in which health literacy and behaviors that promote health could regulate the connection between the two.

Hypothesis
1. There is likely to be a significant correlation among the study variables.
2. There will be a significant moderation effect of health related knowledge on health anxiety and cyberchondira.
3. There will be a significant mediation effect of emotional regulation on health anxiety and cyberchondira.

Conceptual Framework
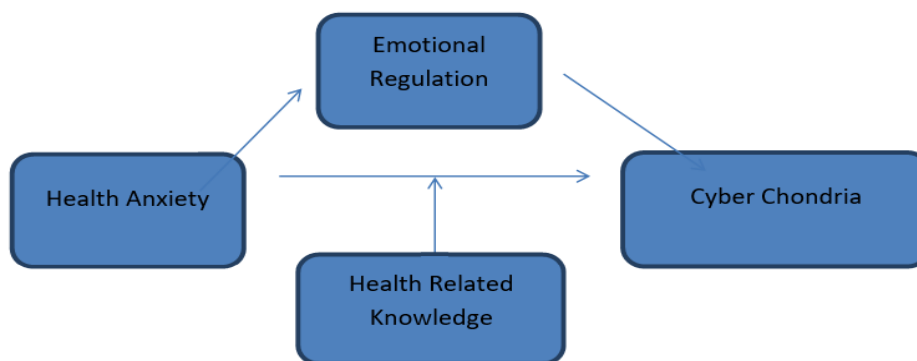
Methodology

In order to gather information on the population of Pakistan, a survey with a cross-sectional design was carried out during the months of May and September 2023. For the purpose of ensuring that the research design was adequate, it was important to choose a large sample size. Utilizing G-Power was the method that we utilized in order to determine the size of the sample. A representative sample of 346 people was used to reflect the whole population. For the purpose of self-administration, a total of four hundred questionnaires were provided. In order to simplify the process of data collection, accessible sampling is utilized. In order to participate in the research, every individual participant gave their informed and unequivocal consent before beginning the study. Only those individuals who denied having used any drugs that were not prescribed by a doctor were allowed to take part in the research study. Following the completion of statistical analysis on 255 responses, it was concluded that the response rate was achieved at 83 percent.

Research Instruments

1. In this study, we used the validated 18-item self-reported Short Health Anxiety Inventory to evaluate the level of health anxiety that individuals had experienced over the course of the previous six months. The cognitive model of health anxiety serves as the foundation for the implementation of this measure (Ögel-Balaban, 2022). There was a 0.87 Cronbach's alpha coefficient that was obtained from the scale.

2. In order to investigate the regulation of emotions, we utilized the issues in emotion regulation scale. There are 36 questions in the DERS questionnaire, and responders are required to evaluate statements such as "I struggle to comprehend my emotions" using a Likert scale that ranges from 1 (almost never) to 5 (very often). Following an evaluation using Cronbach's alpha (α), it was determined that the DERS items had a reliability level of 0.80, which signifies a satisfactory level of internal consistency.

3. It is possible to utilize the Cyberchondria Severity Instrument-Short Form (CSS-12), which is a self-administered survey, to evaluate the individual's level of concern over their health when using the internet. Every item is evaluated using a scale that ranges from one to five, with one indicating "never" and five indicating "always." Cyberchondria was measured by the researchers in this study using medical skepticism, obsession, and distress as the four components of the disorder. The CSS-12 has been shown to have internal consistency, as demonstrated by a Cronbach's alpha coefficient of 0.79, which was discovered through our analysis.

4. Using a six-factor analysis, the HPLP-II classifies 50 different aspects of health promotion behavior into 52 different categories. The questions include a broad variety of subjects, such as healthy eating and weight management, physical activity, stress management, personal development, relationships, and taking personal responsibility for one's own health. There is a point value that ranges from nine to thirty-six for each question. Through the use of the Likert scale, participants are provided with four different response options: never, occasionally, frequently, and very often (Nguyen et al., 2020).

Data Analysis

Hayes PROCESS, a well-known mediation and moderation technique, was utilized in this investigation to evaluate the hypothesis. Additionally, descriptive statistics on demographic data were utilized to further support the hypothesis. Research can benefit from the complete framework provided by the Hayes PROCESS analysis, which allows for the examination of the mediating and moderating effects. This fusion makes the links between variables more transparent, which is a significant benefit.

Results

Table 1 study participants information (N= 255)

Variables	F(%)	Mean (SDV)
Male	165 (64.7)	
Female	90 (35.3)	
Age		**23.17 (5.32)**
Rural	101 (39.6)	
Urban	154 (60.4)	
Qualification		
Matric to intermediate	64 (25.0)	
Graduation	159 (62.3)	
Post-graduation	32 (13.7)	

The study had 255 participants, and their demographic information is presented in Table 1. The participants were composed of 64.7% males and 35.3% females. The age of the participants varied from an average of 23.17 to a standard deviation of 5.32. Regarding their place of residence, 39.6% of individuals hailed from rural areas, while 60.4% resided in urban environments. Regarding educational attainment, 25% of the population had finished secondary school, 62.3% had obtained a bachelor's degree, and 13.7% had earned higher degrees.

Table 2 Correlational Analysis

Variables	1	2	3	4
1. Anxiety	-	0.43*	0.65*	-0.47
2. Cyberchondira		-	0.35**	-0.39*
3. Emotional			-	-0.54**
4. Health Knowledge				-

Table 2 displays the results of the correlational analysis performed on the variables that were investigated in this study. In connection to Cyberchondria and Emotional Regulation, it was seen that there was a positive correlation ($r = 0.43$, $p < 0.05$) between Health Anxiety and Cyberchondria. Conversely, there was a negative correlation ($r = -0.47$, $p < 0.05$) between Health Anxiety and Emotional Regulation. There was a noteworthy positive connection ($r = 0.35$, $p < 0.01$) seen between Cyberchondria and Emotional Regulation. On the other hand, a substantial negative correlation ($r = -0.39$, $p < 0.05$) was discovered between Cyberchondria and Health Knowledge. A negative association was observed between Health Knowledge and Emotional Regulation, as shown by a correlation coefficient of -0.54 and a significance level of $p < 0.01$.

Table 3 PROCESS Analysis (Mediation & Moderation)

Variable	Beta	T	P	LL/UL
Health related knowledge Moderation effect on health anxiety and cyberchondira	0.65*	5.36	0.032	1.45/.74
Emotional regulation Mediation effect health anxiety and cyberchondira	0.39**	6.22	0.001	1.67/.043

The findings of the PROCESS analysis are presented in Table 3, which explicitly analyzed the impacts of mediation and moderation among the variables that were being investigated. There was a statistically significant association between health anxiety and cyberchondria, which was impacted by health-related information. The relationship was statistically significant (Beta = 0.65, T = 5.36, p = 0.032), and the confidence range for this relationship was 1.45 to 0.74. Furthermore, emotional modulation was found to have a significant impact on the connection between cyberchondria and health anxiety. The statistical analysis showed that there was a significant mediation effect (Beta = 0.39, T = 6.22, p = 0.001), and the confidence interval for this effect ranged from 1.67 to 0.043. According to the findings, emotional regulation appears to play a part in the connection between health anxiety and cyberchondria, and the findings also indicate that information connected to health has an effect on the association between the two illnesses.

Discussion
The purpose of this research is to explore the prevalence of health concerns and cyberchondria in Pakistanis individuals (Raza, Khalid, et al., 2023b). As potential moderators and mediators, this research also investigated the role that emotional regulation, health literacy, and health promotion have in the relationship.

Cyberchondria, also known as the practice of self-monitoring and diagnosis, has been linked to an increase in the number of health problems. Recent studies have shown that the prevalence of health anxiety has increased by ten percent over the course of four years. 49.3 percent of the people who have been impacted by the COVID-19 pandemic have demonstrated an increase in their level of health concern. There was no statistically significant difference in the proportion of cyberchondria cases classified as moderate and those classified as severe, according to the findings of this study (Shehata et al., 2023). The findings of a study that was carried out by SeyedHashemi et al. (2020) indicate that fifty percent of students who have moderate cyberchondria and twenty-five percent of students who have significant cyberchondria participate in self-diagnosis. An investigation that was carried out in India not too long ago has shown that cyberchondria is becoming an increasingly common public mental health problem. According to the findings of the studies, cyberchondria affected 55.6% of the people who were examined. Key themes that were seen were an increased concern for one's health, inquiries and concerns regarding the internet, and a strong want for reassurance (Sathish et al., 2017). On the other hand, among the group of people who took part in this research, 56 percent of them shown a lack of appropriate health literacy, and 49 percent demonstrated a lack of involvement in health promotion activities. When individuals lack adequate health literacy, they struggle to discriminate between information that is trustworthy and information that is misleading, which makes it more difficult for them to successfully avoid sickness. There is a possibility that their susceptibility to misinformation, false news, and sources that cannot be trusted might have a negative impact on their behavior in relation to their health and their overall well-being (Siebenhaar et al., 2020).

The purpose of this study was to explore the influence that health anxiety has on emotional regulation and to take into account the direct, mediating, and moderating effects that the variables have. A negative association was found between health anxiety and self-control, according to the findings of our research. Our participants displayed heightened levels of health worry and reported difficulty in controlling their emotions, which is consistent with the findings of prior research which have been conducted. The association between emotional regulation and health anxiety and cyberchondria is another topic that is investigated in our research. The relationship between cyberchondria and emotional control was revealed to have a strong and robust beneficial correlation. The phrase "I firmly believe that I will experience illness" is an example of a negative cognitive pattern that is associated with health anxiety (Starcevic, 2017). This mental process has the potential to set off a never-ending circle of dysfunctional body symptoms, thoughts motivated by the need to acquire knowledge, and cognitive activity, which ultimately leads to an ongoing cycle of negative emotions. Throughout the course of human history, issues in regulating emotions have been related

to a wide range of mental and behavioral health disorders. These illnesses include a fear of falling and a propensity to avoid engaging in physical exercise. As a result of difficulty in maintaining emotional control, individuals may resort to finding health information online rather than visiting a medical expert. This is because insufficient health coping methods are the outcome of these challenges (tePoel et al., 2016).As a result, the ability to effectively regulate one's emotions serves as a preventative strategy against an excessive dependence on online health information and minimizes the amount of discomfort that is associated with health-related activities(Van den Broucke, 2020).

When taking into consideration potential moderators, this research also takes into account health literacy and health promotion methods. Based on the findings, it was determined that health literacy has a significant and negative impact on the ability to regulate emotions and anxiety related to health management (Ullah et al., 2022). This study had a number of intrinsic problems, one of which was the existence of insufficient health literacy, which exacerbated the negative influence that health anxiety had on the ability to manage one's emotions. It is concerning that low-income countries have a high frequency of inadequate health literacy, as indicated by studies (Wakashima et al., 2020). This is a matter for concern. It is possible that these effects were made worse by a lack of adequate health literacy. According to the findings of Afshari and colleagues, 71.9% of the population possessed low levels of health literacy. Literacy in health care has a huge impact on the existing health care systems, which in turn has an effect on both spending and results (Vismara et al., 2020). The decisions and actions that medical patients take about health promotion are susceptible to being influenced by their level of health literacy.

Additionally, cyberchondria and emotional control are investigated in this study, as well as the influence that health promotion activities have on these aspects of the individual. There was a significant amount of evidence that demonstrated the detrimental effect that health promotion efforts have on emotional regulation and cyberchondria(Wu et al., 2021). An insufficient level of resilience in health promotion is demonstrated by the participants (Khalid et al., 2023). This disorder, which is defined by excessive health-related worry, is made worse by an insufficient ability to manage emotions, and it is further made worse by a lack of physical exercise that supports good health. Cyberchondria is a condition characterised by excessive anxiety connected to health (Yalçın et al., 2022). According to this, it appears that individuals are not making good use of strategies that aid persons who suffer from cyberchondria in regaining emotional control. People who struggle to control their feelings as a result of a lack of participation in activities that are beneficial to their health are more likely to suffer from cyberchondria. A lack of participation in health-enhancing activities, such as regular physical activity, stress management, and the cultivation of solid social relationships, was demonstrated by the individuals who took part in the current research study. The condition known as cyberchondria is characterized by an obsessive obsession with one's health, which leads to an excessive and persistent search for symptoms and diseases on the internet (Zhang, 2017).

The findings of this study contribute to a deeper comprehension of the intricate relationships that exist between individual psychological characteristics, such as concern for one's health and the ability to maintain emotional control, and the propensity of individuals to look for medical information on the internet (Sathish et al., 2017). This research sheds light on the ways in which individuals deal with the pressures that are associated with their health in this era of digital technology by highlighting the significance of health literacy and activities that promote health as possible mediators. The findings of this study contribute to a better understanding of cyberchondria by demonstrating how health literacy and behaviors that promote health can have an impact on the severity and effects of the condition (Patanapu et al., 2022). Additionally, it offers a significant contribution to the current body of knowledge in the domains of health psychology and public health by highlighting the necessity of comprehensive treatment techniques for individuals. This is a significant contribution. Individuals who suffer from cyberchondria have a propensity to seek

medical advice from questionable websites on the internet. In order to guarantee the dependability of the health information that is available on the internet, it is necessary for webmasters, medical experts, and physicians to work together. Dumitru and his colleagues are in favor of the introduction of accuracy checks and the enforcement of access restrictions on websites that are deemed to be questionable.

Having accepted the limits of the study, the researchers moved on. One possible explanation for the absence of causation is that the procedure of data collection relied heavily on measures that were self-reported by the sample. For the sake of future study, experimental and longitudinal designs should be utilized. The scope of cyberchondria research needs to include medical disorders; nevertheless, the majority of the participants in our study were individuals who did not exhibit any clinical symptoms.

Conclusion

It is possible for health information found online to be both accurate and incorrect. The individuals who participated in our research showed a lower tendency to engage in activities that are beneficial to their health, and they had lower levels of skill in comprehending information that is connected to health. As a result of the efforts that individuals took on their health literacy, the connection between health concerns and emotional regulation significantly decreased. However, cyberchondria was made worse by a lack of emotional management skills, which was one of the negative aspects. Health-promoting actions were included in the unfavorable factors. Both cyberchondria and health anxiety are influenced by the way in which emotions are modulated.

References

1. Ackerman, J. M., Tybur, J. M., & Blackwell, A. D. (2021). What Role Does Pathogen-Avoidance Psychology Play in Pandemics? Trends in Cognitive Sciences, 25(3), 177–186. https://doi.org/10.1016/j.tics.2020.11.008
2. Afridi, M. I., &Rasool, G. (2015). PREVALENCE AND PATTERN OF SELF-MEDICATION IN KARACHI- A COMMUNITY SURVEY.Pakistan Journal of Medical Sciences, 31(5). https://doi.org/10.12669/pjms.315.8216
3. Ahmad, A. R., &Murad, H. R. (2020). "The Impact of Social Media on Hyped Panic during the COVID-19 Pandemic: The Iraqi Kurdistan Case'" (Preprint).JMIR Mental Health, 22(5). https://doi.org/10.2196/19556
4. Ahmed, W., Shaikh, Z. N., Soomro, J. A., Qazi, H. A., &Soomro, A. K. (2018). Assessment of health literacy in adult population of Karachi: a preliminary investigation for concept-based evidence. International Journal of Health Promotion and Education, 56(2), 95–104. https://doi.org/10.1080/14635240.2017.1421866
5. Akhtar, M., & Fatima, T. (2019). Exploring cyberchondria and worry about health among individuals with no diagnosed medical condition. Journal of the Pakistan Medical Association, 0, 1. https://doi.org/10.5455/jpma.8682
6. Awais-E-Yazdan, M., Ilyas, M. A., Aziz, M. Q., & Waqas, M. (2022). Dataset on the safety behavior among Pakistani healthcare workers during COVID-19.Data in Brief, 41, 107831. https://doi.org/10.1016/j.dib.2022.107831
7. Bajcar, B., &Babiak, J. (2019). Self-esteem and cyberchondria: The mediation effects of health anxiety and obsessive–compulsive symptoms in a community sample. Current Psychology. https://doi.org/10.1007/s12144-019-00216-x
8. Barke, A., Bleichhardt, G., Rief, W., &Doering, B. K. (2016). The Cyberchondria Severity Scale (CSS): German Validation and Development of a Short Form. International Journal of Behavioral Medicine, 23(5), 595–605. https://doi.org/10.1007/s12529-016-9549-8
9. Baumgartner, S. E., & Hartmann, T. (2011). The Role of Health Anxiety in Online Health Information Search. Cyberpsychology, Behavior, and Social Networking, 14(10), 613–618. https://doi.org/10.1089/cyber.2010.0425

10. Bergeron, S. L., & Sanchez, A. L. (2005). Media Effects on Students during SARS Outbreak. Emerging Infectious Diseases, 11(5), 732–734. https://doi.org/10.3201/eid1105.040512

11. Blakey, S. M., & Abramowitz, J. S. (2017). Psychological Predictors of Health Anxiety in Response to the Zika Virus.Journal of Clinical Psychology in Medical Settings, 24(3-4), 270–278. https://doi.org/10.1007/s10880-017-9514-y

12. Curtis, A. F., Rodgers, M., Miller, M. B., & McCrae, C. S. (2021). Impact of Sex on COVID-19 Media Exposure, Anxiety, Perceived Risk, and Severity in Middle-Aged and Older Adults.Journal of Aging and Health, 089826432110253. https://doi.org/10.1177/08982643211025383

13. Doherty-Torstrick, E. R., Walton, K. E., & Fallon, B. A. (2016). Cyberchondria: Parsing health anxiety from online behavior. Psychosomatics, 57(4), 390–400. https://doi.org/10.1016/j.psym.2016.02.002

14. Duplaga, M., &Grysztar, M. (2021). The Association between Future Anxiety, Health Literacy and the Perception of the COVID-19 Pandemic: A Cross-Sectional Study. Healthcare, 9(1), 43. https://doi.org/10.3390/healthcare9010043

15. Finbråten, H. S., Wilde-Larsson, B., Nordström, G., Pettersen, K. S., Trollvik, A., &Guttersrud, Ø. (2018). Establishing the HLS-Q12 short version of the European Health Literacy Survey Questionnaire: latent trait analyses applying Raschmodelling and confirmatory factor analysis.BMC Health Services Research, 18(1). https://doi.org/10.1186/s12913-018-3275-7

16. Fong, L., & Law, R. (2013). Hair, J. F. Jr., Hult, G. T. M., Ringle, C. M., Sarstedt, M. (2014). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Sage Publications. ISBN: 978-1-4522-1744-4. 307 pp. European Journal of Tourism Research, 6(2), 211–213. https://doi.org/10.54055/ejtr.v6i2.134

17. Fornell, C., &Larcker, D. F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. Journal of Marketing Research, 18(3), 382. https://doi.org/10.2307/3150980

18. Gao, J., Zheng, P., Jia, Y., Chen, H., Mao, Y., Chen, S., Wang, Y., Fu, H., & Dai, J. (2020). Mental health problems and social media exposure during COVID-19 outbreak.PLOS ONE, 15(4). https://doi.org/10.1371/journal.pone.0231924

19. Garfin, D. R., Silver, R. C., & Holman, E. A. (2020). The novel coronavirus (COVID-2019) outbreak: Amplification of public health consequences by media exposure. Health Psychology, 39(5). https://doi.org/10.1037/hea0000875

20. Goulia, P., Mantas, C., Dimitroula, D., Mantis, D., &Hyphantis, T. (2010). General hospital staff worries, perceived sufficiency of information and associated psychological distress during the A/H1N1 influenza pandemic. BMC Infectious Diseases, 10(1). https://doi.org/10.1186/1471-2334-10-322

21. Gratz, K. L., & Roemer, L. (2004). Multidimensional Assessment of Emotion Regulation and Dysregulation: Development, Factor Structure, and Initial Validation of the Difficulties in Emotion Regulation Scale. Journal of Psychopathology and Behavioral Assessment, 26(1), 41–54. https://doi.org/10.1023/b:joba.0000007455.08539.94

22. Hair, J., Hult, G. T., Ringle, C., &Sarstedt, M. (2014). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). 2014 Faculty Bookshelf. https://digitalcommons.kennesaw.edu/facbooks2014/39

23. Heizomi, H., Iraji, Z., Vaezi, R., Bhalla, D., Morisky, D. E., &Nadrian, H. (2020). Gender Differences in the Associations Between Health Literacy and Medication Adherence in Hypertension: A Population-Based Survey in Heris County, Iran. Vascular Health and Risk Management, Volume 16, 157–166. https://doi.org/10.2147/vhrm.s245052

24. Henseler, J. (2020). Composite-Based Structural Equation Modeling.Guilford Publications.

25. Internet World Stats. (2023). World Internet Users Statistics and 2019 World Population Stats. Internetworldstats.com. https://www.internetworldstats.com/stats.htm

26. Jungmann, S. M., &Witthöft, M. (2020). Health anxiety, cyberchondria, and coping in the current COVID-19 pandemic: Which factors are related to coronavirus anxiety? Journal of Anxiety Disorders, 73, 102239. https://doi.org/10.1016/j.janxdis.2020.102239

27. Khalid, R., Raza, M., Selem, K. M., Ghaderi, Z., & Raza, H. (2023). Natural disaster is a wakeup call before it becomes social disaster and tourophobia of eco-destinations. Asia Pacific Journal of Tourism Research, 28(11), 1226–1240.
https://doi.org/10.1080/10941665.2023.2293789

28. Khalid, R., Raza, M., Selem, K. M., Ghaderi, Z., &Raza, H. (2023). Natural disaster is a wakeup call before it becomes social disaster and tourophobia of eco-destinations. Asia Pacific Journal of Tourism Research, 28(11), 1226–1240. https://doi.org/10.1080/10941665.2023.2293789

29. Khazaal, Y., Chatton, A., Rochat, L., Hede, V., Viswasam, K., Penzenstadler, L., Berle, D., &Starcevic, V. (2020). Compulsive Health-Related Internet Use and Cyberchondria.European Addiction Research, 1–9. https://doi.org/10.1159/000510922

30. Kirmizi, M., Yalcinkaya, G., &Sengul, Y. S. (2021). Gender differences in health anxiety and musculoskeletal symptoms during the COVID-19 pandemic.Journal of Back and Musculoskeletal Rehabilitation, 1–7. https://doi.org/10.3233/bmr-200301

31. Lanfredi, M., Macis, A., Ferrari, C., Meloni, S., Pedrini, L., Ridolfi, M. E., Zonca, V., Cattane, N., Cattaneo, A., & Rossi, R. (2021). Maladaptive behaviours in adolescence and their associations with personality traits, emotion dysregulation and other clinical features in a sample of Italian students: a cross-sectional study. Borderline Personality Disorder and Emotion Dysregulation, 8(1). https://doi.org/10.1186/s40479-021-00154-w

32. Marcus, D. K. (1999). The cognitive-behavioral model of hypochondriasis.Journal of Psychosomatic Research, 47(1), 79–91. https://doi.org/10.1016/s0022-3999(99)00008-2

33. McElroy, E., &Patalay, P. (2019). In search of disorders: internalizing symptom networks in a large clinical sample. Journal of Child Psychology and Psychiatry.
https://doi.org/10.1111/jcpp.13044

34. McMullan, R. D., Berle, D., Arnáez, S., &Starcevic, V. (2019). The relationships between health anxiety, online health information seeking, and cyberchondria: Systematic review and meta-analysis. Journal of Affective Disorders, 245, 270–278.
https://doi.org/10.1016/j.jad.2018.11.037

35. Metin, A., Erbiçer, E. S., Şen, S., &Çetinkaya, A. (2022). Gender and COVID-19 related fear and anxiety: A meta-analysis. Journal of Affective Disorders, 310, 384–395.
https://doi.org/10.1016/j.jad.2022.05.036

36. Mushtaque, I., Dasti, M. R., Mushtaq, M., & Ali, A. (2021). Attitude towards Covid-19 Vaccine: A Cross-Sectional Urban and Rural Community Survey in Punjab, Pakistan. Hospital Topics, 1–8. https://doi.org/10.1080/00185868.2021.2001399

37. Mushtaque, I., Muhammad Riaz Khan, Zahra, R., SyedaManal Fatima, Ejaz, M., Tauqeer Ahmed Lak, Rizwan, M., Muhammad Awais-E-Yazdan, &Raza, M. (2022). Prevalence of Coronavirus Anxiety, Nomophobia, and Social Isolation Among National and Overseas Pakistani Students. Journal of Population and Social Studies [JPSS], 30, 408–422. https://so03.tci-thaijo.org/index.php/jpss/article/view/258736

38. Mushtaque, I., Raza, A. Z., Khan, A. A., &Jafri, Q. A. (2021).Medical Staff Work Burnout and Willingness to Work during COVID-19 Pandemic Situation in Pakistan.Hospital Topics, 1–9. https://doi.org/10.1080/00185868.2021.1927922

39. Nadeem, F., Malik, N. I., Atta, M., Ullah, I., Martinotti, G., Pettorruso, M., Vellante, F., Di Giannantonio, M., & De Berardis, D. (2022). Relationship between Health-Anxiety and Cyberchondria: Role of Metacognitive Beliefs. Journal of Clinical Medicine, 11(9), 2590. https://doi.org/10.3390/jcm11092590

40. Newby, J. M., Hobbs, M. J., Mahoney, A. E. J., Wong, S. (Kelvin), & Andrews, G. (2017). DSM-5 illness anxiety disorder and somatic symptom disorder: Comorbidity, correlates, and overlap with DSM-IV hypochondriasis. Journal of Psychosomatic Research, 101, 31–37. https://doi.org/10.1016/j.jpsychores.2017.07.010

41. Nguyen, L. H., Drew, D. A., Graham, M. S., Joshi, A. D., Guo, C.-G., Ma, W., Mehta, R. S., Warner, E. T., Sikavi, D. R., Lo, C.-H., Kwon, S., Song, M., Mucci, L. A., Stampfer, M. J., Willett, W. C., Eliassen, A. H., Hart, J. E., Chavarro, J. E., Rich-Edwards, J. W., & Davies, R. (2020). Risk of COVID-19 among front-line health-care workers and the general community: a prospective cohort study. The Lancet Public Health, 5(9). https://doi.org/10.1016/s2468-2667(20)30164-x

42. Ögel-Balaban, H. (2022). The use of online social network sites during the COVID-19 pandemic as a protective or risk factor for well-being of university students.Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 16(3). https://doi.org/10.5817/cp2022-3-4

43. Oh, H. J., & Lee, H. (2019). When Do People Verify and Share Health Rumors on Social Media? The Effects of Message Importance, Health Anxiety, and Health Literacy.Journal of Health Communication, 24(11), 837–847. https://doi.org/10.1080/10810730.2019.1677824

44. PARLAK, A. G., & AKGÜN ŞAHİN, Z. (2021). THE EFFECT OF COVID 19 FEAR ON QUALITY OF LIFE IN HEMODIALYSIS PATIENTS: A CORRELATION STUDY IN TURKEY Hemodialysis; Covid 19; Fear; Quality of life. Samsun SağlıkBilimleriDergisi. https://doi.org/10.47115/jshs.882164

45. Patanapu, S., Sreeja, C., Veeraboina, N., Reddy, K., Voruganti, S., &Anusha, P. (2022). Prevalence and effect of cyberchondria on academic performance among undergraduate dental students: An institutional based study. Industrial Psychiatry Journal, 31(2), 228. https://doi.org/10.4103/ipj.ipj_272_21

46. Raza, M., Khalid, R., & Raza, H. (2023a). Hey brand, let me take a selfie to get you out of the crisis. Journal of Hospitality and Tourism Insights. https://doi.org/10.1108/jhti-05-2023-0334

47. Raza, M., Khalid, R., & Raza, H. (2023b). Surviving and thriving through a crisis: a resiliency branding approach to transform airline industry. Kybernetes. https://doi.org/10.1108/k-07-2022-1062

48. Raza, M., Khalid, R., &Raza, H. (2023a). Hey brand, let me take a selfie to get you out of the crisis. Journal of Hospitality and Tourism Insights. https://doi.org/10.1108/jhti-05-2023-0334

49. Raza, M., Khalid, R., &Raza, H. (2023b). Surviving and thriving through a crisis: a resiliency branding approach to transform airline industry. Kybernetes. https://doi.org/10.1108/k-07-2022-1062

50. Raza, M., Khalique, M., Khalid, R., Jati Kasuma, Ali, W., & Selem, K. M. (2023). Achieving SMEs' excellence: scale development of Islamic entrepreneurship from business and spiritual perspectives. Journal of Islamic Accounting and Business Research. https://doi.org/10.1108/jiabr-02-2023-0060

51. Raza, M., Khalique, M., Khalid, R., JatiKasuma, Ali, W., &Selem, K. M. (2023).Achieving SMEs' excellence: scale development of Islamic entrepreneurship from business and spiritual perspectives.Journal of Islamic Accounting and Business Research. https://doi.org/10.1108/jiabr-02-2023-0060

52. Reznik, A., Gritsenko, V., Konstantinov, V., Khamenka, N., &Isralowitz, R. (2020). COVID-19 Fear in Eastern Europe: Validation of the Fear of COVID-19 Scale. International Journal of Mental Health and Addiction. https://doi.org/10.1007/s11469-020-00283-3

53. Riehm, K. E., Feder, K. A., Tormohlen, K. N., Crum, R. M., Young, A. S., Green, K. M., Pacek, L. R., La Flair, L. N., &Mojtabai, R. (2019). Associations between Time Spent Using Social Media and Internalizing and Externalizing Problems among US Youth. JAMA Psychiatry, 76(12), 1266–1273. https://doi.org/10.1001/jamapsychiatry.2019.2325

54. Rizwan, M., Ahmad, T., Qi, X., Murad, M. A., Baig, M., Sagga, A. K., Tariq, S., Baig, F., Naz, R., &Hui, J. (2021). Social Media Use, Psychological Distress and Knowledge, Attitude, and Practices Regarding the COVID-19 Among a Sample of the Population of Pakistan. Frontiers in Medicine, 8. https://doi.org/10.3389/fmed.2021.754121

55. SajadRezaei,&Springerlink (Online Service. (2019). Quantitative Tourism Research in Asia : Current Status and Future Directions. Springer Singapore.

56. Salari, N., Hosseinian-Far, A., Jalali, R., Vaisi-Raygani, A., Rasoulpoor, S., Mohammadi, M., Rasoulpoor, S., &Khaledi-Paveh, B. (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis. Globalization and Health, 16(1), 1–11. https://doi.org/10.1186/s12992-020-00589-w

57. SALKOVSKIS, P. M., RIMES, K. A., WARWICK, H. M. C., & CLARK, D. M. (2002). The Health Anxiety Inventory: development and validation of scales for the measurement of health anxiety and hypochondriasis. Psychological Medicine, 32(05). https://doi.org/10.1017/s0033291702005822

58. Sathish, T., Kannan, S., Sarma, S. P., Razum, O., Sauzet, O., &Thankappan, K. R. (2017). Seven-year longitudinal change in risk factors for non-communicable diseases in rural Kerala, India: The WHO STEPS approach. PLOS ONE, 12(6), e0178949. https://doi.org/10.1371/journal.pone.0178949

59. SeyedHashemi, S. G., Hosseinnezhad, S., Dini, S., Griffiths, M. D., Lin, C.-Y., &Pakpour, A. H. (2020).The mediating effect of the cyberchondria and anxiety sensitivity in the association between problematic internet use, metacognition beliefs, and fear of COVID-19 among Iranian online population.Heliyon, 6(10), e05135. https://doi.org/10.1016/j.heliyon.2020.e05135

60. Shehata, A. E., Khan, M. A., Khalid, R., Raza, M., & Selem, K. M. (2023). Consequences of paradoxical leadership in the hotel setting: moderating role of work environment. Journal of Hospitality Marketing & Management, 1–24. https://doi.org/10.1080/19368623.2023.2190318

61. Shehata, A. E., Khan, M. A., Khalid, R., Raza, M., &Selem, K. M. (2023). Consequences of paradoxical leadership in the hotel setting: moderating role of work environment. Journal of Hospitality Marketing & Management, 1–24. https://doi.org/10.1080/19368623.2023.2190318

62. Siebenhaar, K. U., Köther, A. K., &Alpers, G. W. (2020). Dealing With the COVID-19 Infodemic: Distress by Information, Information Avoidance, and Compliance With Preventive Measures. Frontiers in Psychology, 11. https://doi.org/10.3389/fpsyg.2020.567905

63. Sørensen, K., Pelikan, J. M., Röthlin, F., Ganahl, K., Slonska, Z., Doyle, G., Fullam, J., Kondilis, B., Agrafiotis, D., Uiters, E., Falcon, M., Mensing, M., Tchamov, K., Broucke, S. van den, & Brand, H. (2015). Health literacy in Europe: comparative results of the European health literacy survey (HLS-EU). The European Journal of Public Health, 25(6), 1053–1058. https://doi.org/10.1093/eurpub/ckv043

64. Starcevic, V. (2017).Cyberchondria: Challenges of Problematic Online Searches for Health-Related Information. Psychotherapy and Psychosomatics, 86(3), 129–133. https://doi.org/10.1159/000465525

65. Starcevic, V., &Berle, D. (2013).Cyberchondria: towards a better understanding of excessive health-related Internet use. Expert Review of Neurotherapeutics, 13(2), 205–213. https://doi.org/10.1586/ern.12.162

66. Tanis, M., Hartmann, T., &tePoel, F. (2016). Online health anxiety and consultation satisfaction: A quantitative exploratory study on their relations. Patient Education and Counseling, 99(7), 1227–1232. https://doi.org/10.1016/j.pec.2016.01.021

67. tePoel, F., Baumgartner, S. E., Hartmann, T., & Tanis, M. (2016). The curious case of cyberchondria: A longitudinal study on the reciprocal relationship between health anxiety and online health information seeking. Journal of Anxiety Disorders, 43, 32–40. https://doi.org/10.1016/j.janxdis.2016.07.009

68. Ullah, I., Ali, S., Ashraf, F., Hakim, Y., Ali, I., Ullah, A. R., Chattu, V. K., &Pakpour, A. H. (2022). Prevalence of depression and anxiety among general population in Pakistan during COVID-19 lockdown: An online-survey. Current Psychology. https://doi.org/10.1007/s12144-022-02815-7

69. Van den Broucke, S. (2020). Why Health Promotion Matters to the COVID-19 pandemic, and Vice Versa. Health Promotion International, 35(2). https://doi.org/10.1093/heapro/daaa042

70. van den Heuvel, O. A., Veale, D., & Stein, D. J. (2014). Hypochondriasis: considerations for ICD-11. RevistaBrasileira de Psiquiatria (Sao Paulo, Brazil: 1999), 36 Suppl 1, 21–27. https://doi.org/10.1590/1516-4446-2013-1218

71. Varma, R., Das, S., & Singh, T. (2021). CyberchondriaAmidst COVID-19 Pandemic: Challenges and Management Strategies. Frontiers in Psychiatry, 12. https://doi.org/10.3389/fpsyt.2021.618508

72. Vismara, M., Caricasole, V., Starcevic, V., Cinosi, E., Dell'Osso, B., Martinotti, G., &Fineberg, N. A. (2020). Is cyberchondria a new transdiagnostic digital compulsive syndrome? A systematic review of the evidence.Comprehensive Psychiatry, 99, 152167. https://doi.org/10.1016/j.comppsych.2020.152167

73. Wakashima, K., Asai, K., Kobayashi, D., Koiwa, K., Kamoshida, S., &Sakuraba, M. (2020). The Japanese version of the Fear of COVID-19 scale: Reliability, validity, and relation to coping behavior. PLOS ONE, 15(11), e0241958. https://doi.org/10.1371/journal.pone.0241958

74. Wu, G., Deng, X., & Liu, B. (2021).Using fear appeal theories to understand the effects of location information of patients on citizens during the COVID-19 pandemic.Current Psychology. https://doi.org/10.1007/s12144-021-01953-8

75. Xiong, J., Lipsitz, O., Nasri, F., Lui, L. M. W., Gill, H., Phan, L., Chen-Li, D., Iacobucci, M., Ho, R., Majeed, A., & McIntyre, R. S. (2020). Impact of COVID-19 Pandemic on Mental Health in the General population: a Systematic Review. Journal of Affective Disorders, 277, 55–64. https://doi.org/10.1016/j.jad.2020.08.001

76. Yalçın, İ., Boysan, M., Eşkisu, M., &Çam, Z. (2022). Health anxiety model of cyberchondria, fears, obsessions, sleep quality, and negative affect during COVID-19. Current Psychology. https://doi.org/10.1007/s12144-022-02987-2

77. Zakar, R., Iqbal, S., Zakar, M. Z., & Fischer, F. (2021). COVID-19 and Health Information Seeking Behavior: Digital Health Literacy Survey amongst University Students in Pakistan. International Journal of Environmental Research and Public Health, 18(8), 4009. https://doi.org/10.3390/ijerph18084009

78. Zhang, M. W. B. (2017). Mental Health in the Digital Age: Grave Dangers, Great Promise Edited by Elias Aboujaoude and VladanStarcevic Oxford University Press, 2015, £29.58, pb, 302 pp. ISBN: 9780199380183. BJPsych Bulletin, 41(3), 183–183. https://doi.org/10.1192/pb.bp.116.054650