Exploring the Relationship Between "COVID-19" Experiences and People's Health Anxiety: Evidence from the Third Wave of COVID-19

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ABSTRACT The current study aims to explore and investigate the relationship between the experiences of COVID-19 and health anxiety among people. The study design adopted in this study was cross-sectional and primary data were collected from 500 respondents through a structured questionnaire in District Mardan-Pakistan. Bivariate and Multivariate analyses were carried out for measuring the relationship between "COVID-19" experiences and health anxiety, while cause and effects of the mentioned variables were analysed through a logistic regression model. The findings of the study revealed that the prevalence of health anxiety was found highly significant with the "COVID-19" experience. It has been inferred from the study's findings that those people who experienced "COVID-19" had symptoms of health anxiety. The prevalence of health anxiety was found highly significant with "COVID-19" among older people. Establishing psychological and rehabilitation centres for sustained recovery of the "COVID-19" affected people, has also been suggested.

INTRODUCTION

Human mankind today is going through probably the most life-threatening period of the current millennium when its survival is being challenged by the emanation of a new unheard phenomenon called a "severe acute respiratory syndrome coronavirus (SARS-Cov-2)" as it invades many places worldwide quite speedily (Dubey et al. 2020; Jones 2020). The sudden outburst of "COVID-19" was dealt with the appearance of pneumonia, having unknown causes and origin, in the city of "Wuhan, China", during the month of December 2019 (Sahin et al. 2020). This pandemic then spread over the whole country of China and further around the globe with a

very fast ratio. After a thorough examination of the respiratory samples by the "People's Republic of China's Centre for Disease Control", it was declared that the cause of the pneumonia was a "novel coronavirus", thereby naming the said pneumonia as a "Novel Coronavirus Pneumonia (NCP)". It was found that this virus attacks the human respiratory system (Hoehl et al. 2020; Wang et al. 2020a) and was named as "2019-nCoV" by the Chinese scientists, and later as the "Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2)" by the International Committee on Taxonomy of Virus (Zhu et al. 2020; Zu et al. 2020). On February 11, 2020, the World Health Organisation (WHO) named the said pneumonia as "Coronavirus Disease-19 ("COVID-19")" (Madabhavi et al. 2020; Rodriguez-Morales et al. 2020). Although most of the details regarding this virus remain unknown, such

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as, its source and potential to spread across people, a growing ratio of infected cases are reported to have occurred via "human-to-human transmission" (Bai et al. 2020; Huang et al. 2020). The main symptoms of this strange pandemic include fatigue, fever and dry cough (Huang et al. 2020). However, some patients, who have been diagnosed with "COVID-19" in the affected areas, did not show the abovementioned symptoms when they were diagnosed with "COVID-19". Instead, some "COVID-19" patients exhibit only the following "neurological" symptoms as their preliminary symptoms, such as, sickness, nuisance, unsteady walking and languidness, which might be because of non-specific manifestations caused by "COVID-19" (Huang et al. 2020; Mao et al. 2020; Wang et al. 2020b).

Literature Review

A big portion of the world's population presently is mainly confined to their houses or apartments, due to lockdowns nationwide. These measures have been instigated in most of the countries (after China) hit by "COVID-19" to stop the further spread of "COVID-19"(Pulla 2020; Rubin and Wessely 2020). This vastly evolving situation has not only changed the lives of people, but has also negatively affected the private, public and global economy. Reduction in aviation, travel and finance, have been reported as considerable declines in both the supply and demand features of the global economy, as required by different governments globally (Buck et al. 2020; Fotiadis et al. 2021; Ibn-Mohammed et al. 2021; Nicola et al. 2020; Ozili and Arun 2020; Qiu et al. 2020a; Seleiman et al. 2020; Yap 2020). Beyond the effects upon physical wellbeing, the persistent uncertainty, pertaining to the pandemic, have profoundly influenced people's psychological health as well (Brooks et al. 2020; DiGiovanni et al. 2004; Gruber et al. 2020; Kang et al. 2020; Pfefferbaum and North 2020; Wang et al. 2020c). Health anxiety and distress are the outcomes of this infectious disease, which, according to WHO, are expected psychological responses to any uncertain situation (Dubey et al. 2020; Every-Palmer et al. 2020; Petzold et al. 2020; Taubman–Ben-Ari et al. 2020), which mainly occurs as a result of so-

cial withdrawal and self-isolation, along with some other social and economic factors.

An unexpected outburst of the "COVID-19" posed a threat to the psychological wellbeing of the affected individuals and their family members and friends. Among these, suspected patients, confirmed patients, close contacts with patients, medical and related personnel, are more vulnerable to develop depression, anger, health anxiety, and other related mental health issues. Patients may experience the fear of death, while nurses and doctors, who are involved in the treatment of "COVID-19" patients, may go through the fear of infection by this virus, thus spreading it to their friends and family members (Ahmed et al. 2020; Bäuerle et al. 2020; Fountoulakis et al. 2021; Xiang et al. 2020). Traumatic events can decrease individuals' sense of security, reminding them of death, thus having a negative impact upon their psychological health. In addition, questions regarding the epidemic, having no positive answers, such as, when will it end, and what are its treatments, along with continuous exposure to a stream of information related to "COVID-19" and its impact, reducing social relations, and suggestions/restrictions, such as, staying at home/apartments/buildings as much as possible, as all these seem to have negatively influenced peoples' psychological wellbeing (Özdin and Bayrak Özdin 2020). Notwithstanding, the prevalence of stress, depression, health anxiety, and insomnia issues have been observed as occurring more frequently during this pandemic (Mowbray 2020; Torales et al. 2020). Incidences of anxiety, depression and "post-traumatic stress disorder symptoms" have been reported to be between ten percent to eighteen percent of people during and after the "Severe Acute Respiratory Syndrome (SARS)" epidemic (Wu et al. 2005). Research on 253 people from one of the worst affected areas of the "COVID-19" epidemic in China concluded a seven percent occurrence of "post-traumatic stress symptoms", one month after the upsurge of the epidemic (Karoly and Ruehlman 2006). Another research study from China reported that fifty-three percent of individuals passed through "feelings of terror" (Zhang and Ma 2020). There also exists evidence of widespread emotional distress, as a result of the pandemic. For instance, research from China sug-

gests that about twenty-five percent of the population has gone through moderate to severe levels of stress and anxiety-related indications, as a result of "COVID-19" (Qiu et al. 2020; Wang et al. 2020). Similarly, there exists evidence of immense distress associated with "COVID-19". Indeed, many researchers have observed higher levels of fear of infection (Ahorsu et al. 2020; Asmundson et al. 2020; Lee 2020; Mertens et al. 2020; Park et al. 2020). The prevalence of depressive disorders and anxiety may enhance because of the constant and intensified stress of "COVID-19", given the role of stress in the aetiology of such disorders. Also, preliminary evidence exists that such disorders and symptoms may be linked with more severe "COVID-19" progression (Gallagher et al. 2020; Wallace et al. 2020; Yao et al. 2020).

Focus of the Study

The countries, such as Pakistan and China (where the "COVID-19" outburst was experienced the first time) have been greatly affected. On the western side, Italy was reported with the highest ratio of death by "COVID-19", whereas in the north, Iran faced the highest ratio of deaths, after Italy. Moreover, in Pakistan, the "Ministry of Health, Government of Pakistan" on 26 February 2020 in Karachi, Sindh province, confirmed the first "COVID-19" case. On the same day, the "Pakistan Federal Ministry of Health in Islamabad" confirmed one more case. Within 15 days, the total number of confirmed "COVID-19" (positive) cases soared to 20 out of 471 suspected cases, with the highest numbers reported in Sindh province, followed by Gilgit Baltistan. All of these confirmed cases had a recent travel history from Syria, Iran, and London. Currently, such cases are growing at a high rate and the situation seems worse (Abid et al. 2020; Saqlain et al. 2020; Waris et al. 2020). Contemplating consequences, a systematic empirical study is required to disclose the diverse impacts of "COVID-19" on mental health. The current study aims to address this gap in the existing literature on mental health morbidity, prompted by the on-going "COVID-19" endemic. Thus, the aim of this study is to examine the relationship of health anxiety with "COVID-19" experiences empirically, owing to the prolonged confinement of Pakistani people. The study findings may be beneficial to understand the mental health issues related to such epidemics, thus paving the way for future readiness to deal with such pandemics and the resultant issues. In addition, the present study aims to develop a conceptual framework to critically investigate the following objectives.

Objectives of the Study

- To address the gap in the existing literature on mental health morbidity.
- To ascertain the relationship between health anxiety and "COVID-19" experiences.
- To explore the impact of "COVID-19" experiences on health anxiety on different age groups.

RESEARCH METHODOLOGY

The Department of Sociology and Psychology, University of Swabi-Pakistan granted ethics approval for this research work.

Participants and Sample Size

This study has been carried out in District Mardan-Pakistan under the cross-sectional study design while nature of the study is quantitative. A sample size of 500 Pakistani male adults was selected through a random sampling method. The survey was conducted during the third wave of "COVID-19" that is, from 15 March 2021 to 20 April 2021. Primary data were collected from respondents aged 20 years and above, living in district Mardan-Pakistan. The main reason for selecting Mardan is the high intensity of positive cases of "COVID-19" in the third wave, making it the second highest city for positive coronavirus cases in the whole country. According to Roscoe (1975), a sample size between 30 and 500 respondents is suitable for making a generalisation and deriving valid inferences from the phenomenon under consideration.

Conceptual Framework of the Study

The conceptual framework of the current study was derived from one independent variable ("COVID-19" experience), one dependent

variable (health anxiety), and one background variable (age).

Measuring Study Variables

Information pertaining to "COVID-19" experience was collected through self-reports questions and measured by the following items (see Table 1). However, items for health anxiety were selected from the DAAS scale. These questions were framed into two categories as 'Agree' and 'Disagree'.

Data Collection Tools

Primary data was collected through a structured questionnaire, encompassing two main areas, that is, respondents' "COVID-19" experience, and prevalence of health anxiety. Moreover, the co-responding author and his team personally collected the primary data from the above-mentioned research site.

Indexation, Reliability and Data Analysis

All the statements of the mentioned variables were indexed by transforming all the items into a single factor for measurement. Prior to indexation,

a reliability analysis test was performed to examine the internal consistency of the items through Cronbach's alpha. Values derived through reliability tests were greater than 0.70 for both scales (Ullah et al. 2021; Ullah and Muhammad 2020). SPSS was used for the analysis of primary data. Moreover, at the bivariate and multi-variate level analysis, chi-square statistics were applied to examine the hypothetical relationship between "COVID-19" experience and health anxiety. In addition, the sole aim of the multi-variate analysis was to explore whether a difference in health anxiety caused by the "COVID-19" experience was further affected by age of the respondents or not. The strength and direction of the study's variables were measured through Kendall's Tau-b test. Besides, the logistic regression model was used to determine association or cause and effect relationship among age, "COVID-19" experience, and health anxiety.

RESULTS

Relationship of "COVID-19" Experience with Health Anxiety

Data pertaining to "COVID-19" experience and health anxiety is presented in Table 2. Re-

Table 1: Measuring study variables

Variables	Operationalisation
Age Group	1. 20 to 40 years 2. 41 and Above years
"COVID-19" Experience	1. You frequently thought that you affected by the "COVID-19" 2. You visited the hospital for the "COVID-19" test3. You received a positive "COVID-19" test4. You were self-isolated because of "COVID-19"5. Many people in your area got affected by "COVID-19"6. Your family member has a positive "COVID-19" test result7. "COVID-19" killed a lot of people/relatives in your area
Health Anxiety	1. I was conscious of dryness in my mouth 2. I had trouble in breathing3. I experienced shaking4. I was concerned about circumstances in which I would panic and make a fool of myself; I felt I was on the verge of panic5. I was afraid for no apparent reason

Table 2: Relationship of "COVID-19" experience with health anxiety

"COVID-19" experience	Prevalence of health anxiety		Total	Statistics
	Yes	No		
Yes	284 (69.8%)	46 (49.5%)	330 (66%)	$\chi^2 = 13.925$
No	123 (30.2%)	47 (50.5%)	170 (34%)	n = 0.000
Total	407(100%)	93(100%)	500(100%)	$T^b = 0.167$

sults indicate that 407 out of 500 participants had symptoms of health anxiety. Among these, 284 respondents had "COVID-19" experience while 123 respondents did not have "COVID-19" experience. Furthermore, 93 respondents did not have any symptoms of health anxiety. Among these, 46 respondents had "COVID-19" experience and 47 respondents did not have any "COVID-19" experience. Besides, the relationship of "COVID-19" experience with health anxiety is measured through the Chi-square statistics test. Results of the Chi-square found "COVID-19" experience strongly significant with health anxiety, as the χ^2 value disclosed 13.925 strongly significant at a one percent level of significance. Furthermore, to examine the direction and strength of the above-mentioned variables, Kendall's tau-b was applied. Results of the Kendall's tau-b show a strong positive (Tb=0.167) relation between "COVID-19" experience and health anxiety.

Relationship of "COVID-19" Experience with Health Anxiety (Controlling Age of the Participant)

Findings, as shown in the Table 3, revealed that participants from the age group of 20 to 40 years who had "COVID-19" experience, 229 had symptoms of health anxiety, as compared to 54 of those who had no symptoms of health anxiety. Likewise, respondents from the age group of 41 and above years disclosed that from the ones who had "COVID-19" experience, 178 had the symptoms of health anxiety, compared to 39 of those who had no symptoms of health anxiety. In addition, the influence of age group on the association between "COVID-19" experiences with health anxiety was sought out. Among the age group of 20 to 40 years, "COVID-19" experience was found significant with health

anxiety at a 0.5 level of significance as the p-value was found (p=0.046) and observed positive (T^b=0.112). Furthermore, an association between "COVID-19" and health anxiety was found strongly significant at a 0.1 level of significance as the p-value was found (0.000) and observed to be highly positive (0.245) among the age group of 41 years and above.

Logistic Regression Analysis

The impact of age and experience of COVID-19 on the prevalence of health anxiety was examined through logistic regression. In addition, the *"Hosmer and Lemeshow Test"* was performed to check the model fitness. Findings of the mentioned test indicated that the logistic regression model was found statistically significant, as the value of Chi-square=1.683 and p-value is 0.431.

Table 4: Model fitness

Hosmer and Lemeshow Test	χ^2	P
	1.683	.431

a. The cut value is .500

The coefficients of the logistic regression analysis for the age are 0.198 and for the "COVID-19" experience is 0.898. It indicates that a positive change will appear in the health anxiety by the change in age and COVID-19 experience, respectively. The P-values are 0.412 and 0.000 for the age and COVID-19 experience. That shows age as the non-significant factor for anxiety while the P-value for the COVID-19 experience shows that it is a significant factor for anxiety. It means that if the person has the COVID-19 experience,

Table 3: "COVID-19" experience with health anxiety (controlling age of the participant)

Age group	"COVID-19" experience	Prevalence of health anxiety			Statistics
		Yes	No	Total	
20 to 40 years	Yes	173 (75.5%)	34 (63%)	207 (73.1%)	χ^2 = 3.522
	No	56 (24.5%)	20 (37%)	76 (26.9%)	p = 0.046
	Total	229 (100%)	54 (100%)	283 (100%)	T^b = 0.112
41 and above years	Yes	111 (62.4%)	12 (30.8%)	123 (56.7%)	χ^2 = 13.00
	No	67 (37.6%)	27 (69.2%)	94 (43.3%)	p = 20.00
	Total	178 (100%)	39 (100%)	217 (100%)	T^b = 00.245

he or she will have the prevalence of health anxiety. Not with standing, age does not matter in general for health anxiety. Overall R^2 is 0.045, which is 4.5 percent only and correctly classified 81.4 of the cases. Thus, the overall explanation of the model is not so much defined. There are definitely other factors that are significant for health anxiety.

Table 5: Overall modal summary

Dependent variable: Health anxiety variables	Coefficients	p-values
Age	0.198	0.412
Covid-19 experience	0.898	0.000
Constant	-2.849	0.000
R^2 = 0.045		

P-value for Chi-square= 0.431
Percentage Correct = 81.4

DISCUSSION

At the time of the pandemic and uncertainty, anxiety is a normal reaction. The main theme of the present study was to assess the impact of the "COVID-19" experience on health anxiety. This study proceeded with an independent variable, that is, "COVID-19" experience and one dependent variable, that is, prevalence of health anxiety. Findings of the study disclosed that 407 participants had symptoms of health anxiety. Among these, 284 of the respondents had "COVID-19" experience while 123 respondents did not have "COVID-19" experience. The existing literature also points out that worldwide, "COVID-19" has put a huge burden on health systems. Social withdrawal, loneliness, and quarantine have adversely affected the mental health of the "COVID-19" affected. Moreover, immoderate and constant stress activated psychological and physical exhaustion (Kelly 2020; Mukhtar 2020; Sønderskov et al. 2020; Zhang et al. 2020). At the bi-variate level, "COVID-19" experience was found highly significant (0.000) with health anxiety. These findings are closely in line with previous work of Luo et al. (2020) who pointed out that the "COVID-19" epidemic surged the ratio of anxiety up to thirty-three percent among people. Likewise, an empirical study by Mertens et al. (2020) mentioned that the ratio of anxiety in Belgium increases (20%) when compared to the findings of the study conducted in 2018. Similarly, a rapid increase of "COVID-19" contributed to health anxiety across the world due to social isolation, saturated information of media, delay in travel plans, and panic of purchasing daily-based goods (Ho et al. 2020). The results from the multivariate analysis show that among the age group between 20 to 40 years, "COVID-19" experience was found significant with health anxiety at a 0.5 level of significance as the p-value was found (0.046) and observed positive (0.112). Furthermore, association between "COVID-19" and health anxiety was found strongly significant at a 0.1 level of significance, as the p-value was found (0.000) and observed to be highly positive (0.245) among age group between 41 years and above. Likewise, findings from logistic regression analysis for the age are 0.198 and for the "COVID-19" experience is 0.898. It clearly indicates that a positive change will appear in the health anxiety with the change in the age and "COVID-19" experience, respectively. Furthermore, the P-values are 0.412 and 0.000 for the age "COVID-19" experience. That shows age as the non-significant factor for health anxiety while the P-value for the "COVID-19" experience shows that it is a significant factor for health anxiety. Overall R2 is 0.045, which is 4.5 percent only and correctly classified 81.4 of the cases. However, the remaining variation might be due to some other variables that are not included in the present study. Findings vividly indicate that health anxiety triggered by the "COVID-19" experience within older people was found highly significant than the younger population in the study area. These findings could be attributed to the fact that people in old age are considered more vulnerable and at high risk to "COVID-19's" severe effects as compared to the younger ones (Buenaventura et al. 2020). Further, the rate of mortality was high among older adults, and it also assumed that older people are more prone to "COVID-19". Such vulnerability led the old people to be restricted to home, leaving home only at a time of urgency, to keep up with social distancing policy. This uncertain situation was hard to bear by the older citizens, which probably activated psychological problems, particularly, depression and anxiety among the old population (Armitage and Nellums 2020;

Meng et al. 2020; Williams 2020). Likewise, a survey conducted in China disclosed that "COVID-19" significantly enhanced the risk of depressive symptoms and anxiety within older people (Qiu et al. 2020b). Taken together, the empirical findings of the present study and prior empirical work, it is concluded that not only the "COVID-19" patients, but also all those who experienced the "COVID-19" in some form, developed mental issues like depression and anxiety. Moreover, the present study can be considered to be a significant step forward in measuring the negative impact of "COVID-19" pandemic on mental health of the general population in Pakistan. Notwithstanding, this study has made a substantial contribution to existing literature while measuring "COVID-19" experience with health anxiety within different age groups.

CONCLUSION

The "COVID-19" pandemic has had a substantial influence on the people's everyday lives in terms of mental health issues, such as post-traumatic stress disorder (PTSD), general and health anxiety and depression. The present study also explored the association between "COVID-19" experiences and health anxiety among general population. It has been inferred from the study findings that those people who had experience of "COVID-19" had symptoms of health anxiety. In addition, the prevalence of health anxiety was found highly significant with "COVID-19" among older people.

RECOMMENDATIONS

Nevertheless, the study has some practical implications for policymakers and other stakeholders. That is, a consistent effort by the government and non-government organisations is needed to evaluate the impact of "COVID-19" on psychological health especially health related anxiety. In this regard, psychologists and sociologists may be hired in each hospital while treating "COVID-19" patients or suspected patients who have the issue of health anxiety. Moreover, the study also highlights that the major focus will be those people who lost their family members while arranging counselling services for them because these people are more prone to health related anxiety. Websites and online helpline services might be launched to ease mental distress particularly the anxiety related within the people pertaining to this current epidemic. Moreover, the government should establish psychological and rehabilitation centres for the sustained recovery of people affected by "COVID-19".

LIMITATIONS OF THE STUDY

This study has some limitations. Firstly, primary data was collected only from male respondents, as due to cultural barriers it was quite difficult to approach females for data collection within the research site. It is important to mention that culture of the research site strictly prohibited female participation in outside activities. Secondly, the nature of the study was cross-sectional. Lastly, the study did not evaluate pre-pandemic psychological health. It is assumed that these limitations may affect the application of the study on a broader level.

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