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RESEARCH PAPER

# Impact of COVID-19 Fear on the Mental Health of Medical professionals: Gender Differences and Mental Health Outcomes

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**ABSTRACT**

The study investigated how COVID-19 fear impacts the mental health of medical professionals, with a focus on gender differences. Conducted as a cross-sectional survey among 300 medical professionals in Sargodha hospitals, findings revealed that COVID-19 fear significantly and negatively affected mental health outcomes. The study utilized a convenience sampling method and collected data using three self-report measures: the Fear of COVID-19 Scale (Ahorsu et al., 2020) and the Positive Mental Health Scale (Lukat et al., 2016). Regression analysis underscored that fear of COVID-19 was a predictor of poorer mental well-being. Significant differences in fear levels and mental health were noted between male (72.4%) and female (27.6%) participants. To enhance the reliability of results, future studies were recommended to increase sample sizes for greater representativeness and more robust conclusions. Additionally, the study highlighted the need for further research to address remaining gaps and deepen understanding of how COVID-19 fear impacts the mental health of medical professionals.

**Keywords:** COVID-19 Fear, Health Professionals' Mental Health, Medical Workers, Mental Well-Being, Pandemic-Induced Stress

## Introduction

Fear may either be useful or harmful to both mental and physical health during the corona epidemic. Fear can heighten risk perception, causing defensive actions to emerge (maintaining physical distance and washing hands). According to one research (Harper et al., 2020), when people perceive a danger as serious, they participate in more preventative activities. As in the case of pandemic situation, the fear of infection might function as a motivator to engage in activity that aids in the prevention of corona virus (Harper et al., 2020; Pakpour & Griffiths, 2020). Fear, according to updated data, encourages social presence in the expectation to seek affection, approval, and social information, as well as to engage in purchasing behavior for personal protective equipment (Addo et al., 2020).

Although fear, can have disastrous consequences, when reacting to COVID-19 individuals experiencing significant amounts of fear may be unable to think reasonably and clearly. Biasness against Chinese has increased since the emergence of COVID-19 in Wuhan (Devakumar et al., 2020). In just this manner, fear can just be a necessary component of xenophobia and racism to flourish. Suicide risk is also increased by fear. In March of this year, Bangladeshi man of 36-year-old committed himself either he and his community believed he had been infected by pandemic of corona (Mamun & Griffiths, 2020). Sadly, the postmortem indicated that the person had not been infected with the illness. Fear is linked to anxiety levels that are high in the overall public and medical professionals (Lee, 2020; Shanafelt et al., 2020), depression (Lee, 2020; Shanafelt et al., 2020) and anger (Khosravi, 2020; Ahorsu et al., 2020).

According to the stress process model, contextual variables (such as social conditions or life experiences) determine whether or whether the presence of a stressor causes physical or psychological changes in an individual (Zarnab,& Muzaffar, 2023;Pearlin & Bierman, 2013; Wheaton & Montazer, 2010). Since fear arises as a reaction to a perceived danger, the level of fear and concern regarding COVID-19 might indicate the virus's perceived threat (Yaseen, et. al. 2020); Malik et al., 2018; Nellis, 2009; Richman et al., 2008). In other words, existence of increased COVID-19 anxiety suggests virus-related stress. As a result of this stress, mental health may suffer (Pearlin & Bierman, 2013 Moreover, variances in this fear experience might align with variations in the psychological impacts of perceived stress from COVID-19.

According to the study, girls had a greater intensity of fear of corona pandemic than that of boys. This is in line with earlier findings that suggest women were more psychologically vulnerable than males throughout the epidemic of corona (Liu et al., 2020; Rossi et al., 2020; Wang et al., 2020). Such as the research done by Wang et al. (2020), females predicted profound mental consequences of the epidemic of COVID-19. In this survey, 1210 people from 194 cities across China took part. As reported by researchers, females were more affected psychologically by the epidemic, with higher levels of stress, worry, and despair.

**Literature Review**

Fear of infection that can intensify mental problems that are already present and emotional discomfort, as well as create acute worry (Colizzi et al., 2020). In researches, overabundance of COVID-19 fear has also been found that predicted the posttraumatic stress disorder (Sun et al., 2020; Xu et al., 2020). The previous research findings emphasis the significance of accurately evaluating COVID-19 fear in both the general population and people who have mental illnesses to be able to forecast psychological health outcomes.

Fear is a well-recorded (and has been in response to past hazardous epidemic including plague) although typical reaction toward contagious epidemics, and individuals respond toward perceived threat in a variety of ways. For example, fear and anxiety can cause hypervigilance, potentially leading to depression and post-traumatic stress disorder (PTSD) in severe cases (Perrin et al., 2009). In the case of fear of unsure disease's proliferate has an effect on individuals, health, hospitals, and economies, for example, causes anxiety about health in both healthy people and people who have mental health issues (Rubin & Wessely, 2020). Pandemics lead families, individuals, and communities to feel hopeless, despair, sadness, mourning, and a deep loss of purpose (Levin, 2019).

Health emergencies are known to have negative psychosocial effects (Taylor, 2019), and the COVID-19 epidemic will undoubtedly create distress and leave many individuals vulnerable to mental health issues. Mental health consequences will very certainly last longer and peak later than the actual pandemic. In fact, throughout the pandemic, number of the individuals who are afflicted by mental illness is sometimes higher the number of people who are contaminated with virus (Reardon, 2015).

Health care workers' emotional and behavioral responses to high levels of stress are naturally adaptive. Counseling and psychotherapy approaches based on stress adaptation theory can provide rapid and early intervention solutions. Consequently, addressing the mental health needs of medical professionals becomes critical for better prevention and management of epidemics (Banerjee, 2020). Medical professionals often rotate to different regions within the state to take care of confirmed or suspected cases, bolster logistical support and reduce the burden on health care staff. In such a context, disseminating medical guidance through the Internet and electronic media on reducing the risks of transmission between patients and health care providers may help reduce tensions among medical professionals.

The available literature on these variables suggests that not much study the mental health of medical professionals related to fear of COVID-19. Through previous researches, we get to know that these variables are studies with different variables not with study variables and they find the relationship of mental health with other variables. We also study the impact of demographics on study variables. In the study, variable Covid-19 would be negatively predicted mental health among medical professionals. The study aim is to determine the impact of fear of corona pandemic on the mental health of medical practitioners. And also determine the gender and type of profession difference on the study variables.

**Hypotheses**

1. The COVID-19 fear would have a notable negative relation with the mental health of medical professionals

2. The COVID-19 fear would be negatively predicted the mental health of medical professionals.

3. There would be a significantly higher impact of COVID-19 fear on males as compare to females among medical professionals.

4. There would be a significantly higher impact on the mental health of females as compared to males among medical professionals.

5. There would be a significantly higher impact of COVID-19 fear on doctors as compare to nurses/ paramedics among medical professionals.

6. There would be a significantly higher impact on the mental health of nurses/ paramedics as compare to doctors among medical professionals.

**Material and Methods**

The purpose of this study is to examine how the COVID-19 affects the mental health of medical professionals. This chapter provides an overview of this research design, sample size, tools used, and methodology adopted during the research.

**Research Design**

In order to explore the COVID-19 impact on medical professionals mental health assign cross sectional research design. The primary survey method used for data used for this study was personal interview, the researcher distributed questionnaire booklets to medical practitioners.

**Sample**

In this research, a sample of health professionals ($N$= 300) including males ($n$ = 217, 72.4%) and females ($n$ = 83, 27.6%) ($M$ = 1.27, $SD$ = .46) was collected from different medical professionals that were equally divided into subgroups doctors ($n$ = 150, 50%) and nurses / paramedics ($n$ = 150, 50%) providing services in different government and private hospitals. The sample size was deemed sufficient for the results to be generalized. The sample was gathered from several Sargodha hospitals as well as from the province of Punjab. Using a convenient sampling strategy, the data was collected. It refers to the methods used in the research that include choosing people who can be evaluated easily. The researcher will need to invest less money and time in this technique. The healthcare providers who treat Corona patients are guaranteed to meet the criteria for inclusion.

**Table 1**
**Demographic Characteristics of Medical Professionals**

| Characteristics | N | % |
|---|---|---|
| Gender | | |
| Male | 217 | 72.4 |
| Female | 83 | 27.6 |
| Type of Profession | | |
| Doctors | 150 | 50 |
| Nurses / Paramedics | 150 | 50 |

The frequency and percentage of medical professionals with respect to gender and their profession shows in the Table. Higher number of males (*n* = 217, 72.4%) as compared to females (*n* = 83, 27.6%) participated in the study. Equal number of doctors (*n* = 150, 50%) and nurses / paramedics (*n* = 150, 50%) participated in the study.

## Instruments

Fear of COVID-19. The fear of CoVID-19 scale, developed by Ahorso et al. (2020), was designed to assess concerns about contracting the coronavirus. It was created specifically for the Iranian population aged 18 and over who understand and speak Farsi or Farsi. The scale includes seven items that capture different fears related to the virus, such as "I am most afraid of the corona" and "I lose my life because of the corona." Respondents rate these statements on a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Each item is scored between 1 and 5, with a total scale ranging from 7 to 35. Higher scores indicate greater fear of COVID-19. The scale has been validated with satisfactory reliability measures, including test-retest reliability of α = .72 and internal consistency of α = .82. We obtained permission from the developer via email to use the scale in this study.

Positive Mental Health (PMH-scale). The scale developed by Lukat et al. (2016) designed to examine the positive aspects of mental health, focusing on internal psychological and emotional well-being that is influenced by external factors such as social support and relationships. This has been validated using diverse samples that include both mentally ill patients and mentally healthy individuals. Consisting of nine items, the scale uses positively framed statements such as "I enjoy my life" and "I feel adequately equipped to deal with life's challenges." Responses are rated on a 4-point Likert scale ranging from not true (1) to true (4). Scores for each item range from 1 to 4, with a total scale score ranging from 9 to 36. Higher scores indicate stronger positive mental health. The scale demonstrates strong reliability with a test-retest reliability coefficient of .93 and high internal consistency. We obtained permission from the developer via email to use the scale in this study.

## Procedure

First and foremost, the topic was selected after discussing with the supervisor and receiving departmental and board of study approval. The psychology department provided a a letter confirming the researcher's affiliation with the institution as well as details saying that the researcher is working on a study project as part of partial fulfillment of his advanced diploma in clinical psychology. The targeted organizations list includes private and government hospitals was organized. Concerned authorities from the chosen public and private hospitals were contacted, and a permission letter requesting written consent for data collection from the facilities was obtained. For the collection of data, the researcher directly approaches the medical experts. The data for each participant was acquired individually. To build a solid reputation, the nature, purpose, and objectives of the study were explained to the participants. Individuals who meet the inclusion criteria for the research are asked to become participants and enrolled in the study. Excuses of the participants of not willing to participate were accepted with the smiling face. Only the

consenting participants were informed the goals of the study. It was made clear that the information gathered would only be utilized for research reasons and would be kept private. Additionally, participants were told that they could withdraw their data at any point before, during, or after the scale was finished. Participants in the study had to fill out an informed consent form. Systematic instructions regarding the nature of the questions, the rating scale, and how to complete the scale are provided to the participants. Questions from the participants were addressed before to, during, and following the completion of the scale. Participants take 10 to 15 minutes for the completion of the scale. The responses of the participants were encouraging and their responses showed their interest in the study. After the completion of the scale, the researcher checks the responses of the participants to identify the incomplete and double rated questions and requested the participants to answer the left questions and clear about the double rating. The participant was thanked by the researcher for giving of their time and voluntarily participating in the study without any compensation. Out of the 300 forms distributed for data collection, 300 valid forms were returned, meaning the response rate, as determined by the researcher, was 100%.

**Ethical consideration**

Ethical considerations in my research are paramount, as the topic is not sensitive and poses no harm to participants—neither emotionally, mentally, nor physically. Ensuring respect for the dignity of research participants is a primary concern, with the study being culturally and religiously neutral. Confidentiality of research data is rigorously maintained through the use of secure questionnaires. We are dedicated to conducting the research ethically, prioritizing participant confidentiality as a fundamental aspect of my approach. Protecting the privacy of participants is of utmost importance throughout the study.

**Results and discussion**

The purpose of this research was to examine how medical professionals' mental health is affected by their fear of COVID-19. For data analysis a SPSS-25 was used. To determine the demographic features frequencies and percentages were used. Alpha reliability coefficients and descriptive statistics were calculated. To examine the relationships between the parameters Pearson correlation was calculated. In order to examine the COVID-19 impact on medical practitioners' mental health, linear regression analysis was applied. Ultimately, mean differences across demographic parameters were examined using the independent samples t-test.

**Table 2**
**Psychometric Properties and Pearson Correlation among Scales**

| Variables | M | SD | Range | Cronbach's α | 1 | 3 |
|---|---|---|---|---|---|---|
| 1. Fear of Covid - 19 | 19.99 | 8.96 | 7-35 | .97 | - | -.39** |
| 2. Mental health | 17.65 | 8.29 | 9-40 | .97 | | - |

**p < .005.

The psychometric properties for the scales used in the present study shows in Table 2. The Cronbach's α value for Covid, and mental health were .97 and .97 (> .90) which indicated good reliability for all scales administered on medical professionals. Results shows that covid-19 has negative correlation with mental health (r = -.39, p < .001).

**Table 3**
**Linear Regression Showing the Effect of Covid- 19 on Mental Health of Medical Professionals**

| Variables | B | β | SE |
|---|---|---|---|
| Constant | 23.93*** | | 0.98 |
| Fear of COVID-19 | - 0.32*** | - 0.39 | 0.04 |

| | |
|---|---|
| $R^2$ | .15*** |

Note. N = 300.
***p<.001

The impact of Covid 19 on the mental health among medical professionals shows in the Table 5. The $R^2$ value of .15 revealed that predictor variable explained 15% variance in the outcome variable with F (1, 298) = 53.14, p < .001. The finding revealed that Covid-19 negatively predicted mental health (β = -.39, p < .001).

**Table 4**
**Mean, Standard Deviation and t-Values for Men and Women on Variables**

| Variables | Men | | Women | | | | 95%CI | | |
|---|---|---|---|---|---|---|---|---|---|
| | M | SD | M | SD | t (298) | p | LL | UL | Cohen's d |
| Fear of COVID-19 | 23.18 | 9.46 | 11.27 | 4.59 | 10.97 | .000 | 9.77 | 14.04 | 1.60 |
| Mental Health | 16.40 | 7.14 | 20.54 | 9.90 | -4.00 | .000 | -6.16 | -2.10 | 0.47 |

The mean, standard deviation and t-values for males and females on variables are shown in the Table 4. Results indicated significant mean differences on covid- 19 t (298) = 10.97, p < .001. Results indicated significant mean differences on mental health t (298) = -4.00, p < .001. The value of Cohen's d for covid- 19 indicated large effect size (< 0.8) and small effect size for mental health (< 0.2).

**Table 5**
**Mean, Standard Deviation and t-Values for Doctors and Nurses / Paramedics on Variables**

| Variables | Doctors | | Nurses / Paramedics | | | | 95%CI | | |
|---|---|---|---|---|---|---|---|---|---|
| | M | SD | M | SD | t (298) | p | LL | UL | Cohen's d |
| Fear of COVID-19 | 28.83 | 4.19 | 10.95 | 4.49 | 35.62 | .000 | 16.89 | 18.86 | 4.12 |
| Mental Health | 14.02 | 2.46 | 21.07 | 10.18 | -8.23 | .000 | -8.73 | -5.36 | 0.95 |

The variables' mean, standard deviation, and t-values for doctors and nurses/ paramedics are shown in Table 5. The findings showed significant mean differences on covid- 19 *t* (298) = 35.62, *p* < .001. Results indicated significant mean differences on mental health *t* (298) = -8.23, *p* < .001. The value of Cohen's *d* for covid- 19 and mental health indicated large effect size (< 0.8).

## Conclusion

The focus of this study was on the mental well-being of medical professionals, specifically investigating the impact of COVID-19 fear. Another objective was to analyze demographic differences among study variables. Initially, the study established the construct validity, normality, and reliability of its scales (Cox & Stead, 2003). All scales demonstrated alpha coefficients of ≥ .90, indicating their validity (Kline, 2005). The normal distribution of the data was confirmed by estimating the skewness and kurtosis values, which should ideally be between -1 and +1; Scales or items exceeding this threshold were excluded (Cisar & Cisar, 2010; Field, 2005). Results indicated that skewness and kurtosis values for all scales were within acceptable limits, thus avoiding problems associated with univariate analysis (Cisar & Cisar, 2010; Miles & Shevlin, 2001).

Convergent and discriminant construct validity was assessed, with zero-order correlations between variables confirming convergent validity. Additionally, the necessary

assumptions for further regression analysis, including data homogeneity and theoretically consistent correlation coefficients, were met. Next, the study proceeded to test its main hypotheses after addressing these issues.

The primary hypothesis of this study, which stated that COVID-19 fear is negatively associated with the mental health of medical professionals, was supported. Existing theoretical and empirical literature supports the notion that heightened COVID-19 fear contributes to reduced mental health among medical professionals. This fear creates emotional turmoil, heightening the challenges faced by healthcare workers on the front lines of the pandemic. Factors such as increasing confirmed cases, inadequate precautions, extended work hours, isolation from loved ones, and fear of infection increase suicidal ideation, depression, anxiety, suicide attempts, burnout, and drug abuse among medical staff (Lai et al., 2020 Mamun & Griffiths, Pfefferbaum, 2020).

The second hypothesis of this study, which suggested that COVID-19 fear would negatively predict the mental health of medical professionals, was supported by the results of this study. The existing literature consistently indicates that elevated levels of fear are associated with decreased mental well-being. Several studies have shown that exposure to the pandemic increases people's COVID-19 fear, leading to increased symptoms of anxiety, depression, and stress. This pervasive fear affects both healthy individuals and those with pre-existing health conditions (Shigemura et al., 2020). Research by Ahorso et al. (2020) specifically highlighted that COVID-19 may exacerbate symptoms of anxiety and depression in Iranians. Fear is generally a response to perceived threats, and the fear people feel about COVID-19 reflects their perception of the threat of the virus (Malik et al., 2018; Nellis, 2009; Richman et al., 2008). Concerns about COVID-19 are due to stress over high virus levels. This stress, in turn, can negatively impact your health outcomes (Pearlin & Bierman, 2013). Moreover, those who know about COVID-19 think equally differently about the negative effects of stress.

The third hypothesis, which suggested that the impact of COVID-19 fear is significantly greater among medical professionals than among women, could not be supported by the existing literature. Fearing against this hypothesis, research has consistently leveled that women generally play a higher role in COVID-19. As well, efforts have shown that women are more positively present during the COVID-19 pandemic (Liu et al., 2020, Rosi et al., 2020). ; Wang et al., 2020). For example, Wang et al. (2020) conducted a study on 1210 members from 194 economies in China, which revealed that women experience more significant impacts from illness, including higher levels of stress, anxiety, and hopelessness. . Thus, while the results of such a hypothesis were accepted on premise, it contradicts the existing literature, which consistently shows that women are generally more likely to fear and pray to COVID-19 than men.

The fourth hypothesis, stating that women are significantly more susceptible to the mental health of medical women than their male counterparts, is confirmed by the existing literature. Empirical studies show that fear of COVID-19 affects women's health. For example, results from Italy show that COVID-19 is associated with higher psychological susceptibility among women (Rossi et al., 2020). The study found that being female was associated with stronger psychological effects of the epidemic, including higher levels of anxiety, stress, insomnia, adjustment disorder, stress and depression. Similarly, during the COVID-19 outbreak in China, another study examined the prevalence and determinants of post-traumatic stress symptoms (PTSS) (Liu et al., 2020). Results showed that women experienced significantly more PTSS, particularly in the areas of trauma avoidance, negative mood changes, and hyper arousal. The researchers hypothesize that these findings may be due to a more pronounced differential conditioned skin conductance response to unpleasant stimuli in women's brain networks associated with arousal responses and fear.

The fifth hypothesis, suggesting that doctors will be significantly more affected by fear of COVID-19 than nurses/paramedics among medical professionals, is partially supported by the theoretical and empirical literature. Previous research suggests that both doctors and nurses/paramedics are collectively affected by the fear of COVID-19. About 89% of healthcare professionals were worried about their families, and 80% were worried about contracting Covid-19 themselves. In Wuhan, 50.4% of healthcare professionals caring for patients with COVID-19 experienced depression, 34% experienced insomnia, 44.6% had anxiety, and a A significant number showed symptoms of depression (50.4%), insomnia (34.0%), anxiety (44.6%). %), and discomfort (71.5%) (Lai et al., 2020). The results of previous studies showed that nurses, especially in Pakistan, expressed the highest level of anxiety and fear among medical workers. Nurses face a heavy workload due to their responsibilities, which include thorough monitoring, early detection and prevention of various problems, frequent communication with physicians, and providing symptomatic and psychosocial support. (Liu et al., 2020). Similar findings were drawn from another study that focused on nursing staff treating patients with COVID-19 in Karachi, Pakistan (Alwani et al., 2020). Furthermore, previous research has found that women experience more anxiety than men, which is consistent with other studies (Rajkumar, 2020; Lee et al., 2016). The findings of this study are consistent with other research on anxiety levels among healthcare professionals in Pakistan (Urooj et al., 2020; Amin et al., 2020). In contrast, compared to medical doctors, dentists and nurses, pharmacists showed lower levels of anxiety. One possible explanation is the minimal pharmacist-patient interaction in Pakistan.

The sixth hypothesis, which states that mental health of nurses/paramedics will be significantly more affected than that of doctors among medical professionals, is supported by the empirical literature. Research shows that fear of COVID-19 has a more pronounced impact on nurses' mental health. A study of nurses and physicians treating patients with COVID-19 found significant incidences of anxiety, stress, and post-traumatic stress disorder, with nurses and women experiencing more anxiety than men and doctors. This increased impact on nurses is due to their longer shifts and more direct interaction with patients, leading to increased fatigue and stress. Additionally, another study with a similar sample found that the amount of community support physicians received was positively related to their effectiveness and sleep quality, and negatively related to stress and anxiety (Xiao et al., 2020).

**Recommendations**

This study's merits include its large sample size and diverse representation of different populations. However, the study's flaws include the fact that data was collected over a specific time period, as well as the possibility of individuals self-reporting, which could lead to bias. An additional advantage is that the assessment tools that are included in the study had good psychometric qualities, and the sample size was large enough to detect small correlations. There are a few limitations in this study. First, we used a questionnaire-based survey approach, in which the information was gathered on the basis of contender’s integrity, recall, and response capacity. Second, the research were only a few weeks long. Despite these limitations, we believe that bringing these concerns to light would help medical professionals overcome their fears. To generalize the research results increase the sample size of the study. A larger sample size will result in a more representative sample and more significant findings. It is suggested that future researches address the unanswered aspects of your research.

**Reference**

Addo, P. C., Jiaming, F., Kulbo, N. B., & Liangqiang, L. (2020). COVID-19: fear appeal favoring purchase behavior towards personal protective equipment. *The Service Industries Journal, 40*(7-8), 471-490.

Ahorsu, D. K., Lin, C. Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. (2020). The fear of COVID-19 scale: development and initial validation. *International journal of mental health and addiction*, 1-9.

Alwani, S. S., Majeed, M. M., Ramzan, Z., Rauf, S., Syed, M. S., Shah, S. H., ... & Hamirani, F. (2020). Evaluation of knowledge, practices, attitude, and anxiety of nurses towards COVID-19 during the current outbreak in Karachi, Pakistan. *Pakistan Journal of Public Health, 10*(2), 82-90.

Amin, F., Sharif, S., Saeed, R., Durrani, N., & Jilani, D. (2020). *COVID-19 pandemic-knowledge, perception, anxiety and depression among frontline doctors of Pakistan*. BMC psychiatry, 20, 1-9.

Banerjee, D. (2020). The COVID-19 outbreak: Crucial role the psychiatrists can play. *Asian journal of psychiatry,* 50, 102014.

Colizzi, M., Bortoletto, R., Silvestri, M., Mondini, F., Puttini, E., Cainelli, C., ... & Zoccante, L. (2020). Medically unexplained symptoms in the times of COVID-19 pandemic: a case-report. *Brain, behavior, & immunity-health, 5*, 100073.

Devakumar, D., Shannon, G., Bhopal, S. S., & Abubakar, I. (2020). Racism and discrimination in COVID-19 responses. *Lancet* 395(10231), 1194.

Field, A. P. (2005). Is the meta-analysis of correlation coefficients accurate when population correlations vary?. *Psychological methods, 10*(4), 444.

Harper, C. A., Satchell, L. P., Fido, D., & Latzman, R. D. (2021). Functional fear predicts public health compliance in the COVID-19 pandemic. *International journal of mental health and addiction, 19*(5), 1875-1888.

Khosravi, M. (2020). Perceived risk of COVID-19 pandemic: The role of public worry and trust. *Electron J Gen Med. 17* (4): em203.

Kline, T. J. (2005). Psychological testing: A practical approach to design and evaluation. Sage publications.

Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., ... & Hu, S. (2020). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA network open, 3*(3), e203976-e203976.

Lee, S. A. (2020). Coronavirus Anxiety Scale: A brief mental health screener for COVID-19 related anxiety. *Death studies, 44*(7), 393-401.

Levin, J. (2019). *Mental health care for survivors and healthcare workers in the aftermath of an outbreak.* Psychiatry of Pandemics: A Mental Health Response to Infection Outbreak, 127-141.

Li, S., Li, L., Zhu, X., Wang, Y., Zhang, J., Zhao, L., ... & Yang, Y. (2016). Comparison of characteristics of anxiety sensitivity across career stages and its relationship with nursing stress among female nurses in Hunan, China. *BMJ open, 6*(5), e010829.

Liu, N., Zhang, F., Wei, C., Jia, Y., Shang, Z., Sun, L., ... & Liu, W. (2020). Prevalence and predictors of PTSS during COVID-19 outbreak in China hardest-hit areas: Gender differences matter. *Psychiatry research, 287*, 112921.

Lukat, J., Margraf, J., Lutz, R., van der Veld, W. M., & Becker, E. S. (2016). Psychometric properties of the positive mental health scale (PMH-scale). BMC psychology, 4, 1-14.

Malik, A. A., Williams, C. A., Weston, K. L., & Barker, A. R. (2018). Perceptual and prefrontal cortex haemodynamic responses to high-intensity interval exercise with decreasing and increasing work-intensity in adolescents. *International Journal of Psychophysiology,* 133, 140-148.

Mamun, M. A., & Griffiths, M. D. (2020). First COVID-19 suicide case in Bangladesh due to fear of COVID-19 and xenophobia: Possible suicide prevention strategies. *Asian journal of psychiatry, 51*, 102073.

Miles, J., & Shevlin, M. (2000). Applying regression and correlation: A guide for students and researchers.

Nellis, A. M. (2009). Gender differences in fear of terrorism. *Journal of Contemporary Criminal Justice,* 25(3), 322-340.

Pakpour, A. H., & Griffiths, M. D. (2020). The fear of COVID-19 and its role in preventive behaviors. *Journal of concurrent disorders, 2*(1), 58-63.

Pearlin, L. I., & Bierman, A. (2013). Current issues and future directions in research into the stress process. *Handbook of the sociology of mental health*, 325-340.

Perrin, P. C., McCabe, O. L., Everly, G. S., & Links, J. M. (2009). Preparing for an influenza pandemic: mental health considerations. *Prehospital and disaster medicine, 24*(3), 223-230.

Pfefferbaum, B., & North, C. S. (2020). Mental health and the Covid-19 pandemic. *New England journal of medicine, 383*(6), 510-512.

Rajkumar, R. P. (2020). COVID-19 and mental health: A review of the existing literature. *Asian journal of psychiatry, 52*, 102066.

Reardon, S. (2015). Ebola's mental-health wounds linger in Africa: health-care workers struggle to help people who have been traumatized by the epidemic. *Nature, 519*(7541), 13-15.

Richman, J. A., Cloninger, L., & Rospenda, K. M. (2008). Macrolevel stressors, terrorism, and mental health outcomes: Broadening the stress paradigm. *American journal of public health, 98*(2), 323-329.

Rossi, R., Socci, V., Talevi, D., Mensi, S., Niolu, C., Pacitti, F., ... & Di Lorenzo, G. (2020). COVID-19 pandemic and lockdown measures impact on mental health among the general population in Italy. *Frontiers in psychiatry, 11*, 550552.

Rubin, G. J., & Wessely, S. (2020). *The psychological effects of quarantining a city.* Bmj, 368.

Shanafelt, T., Ripp, J., & Trockel, M. (2020). Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic. *Jama, 323*(21), 2133-2134.

Shigemura, J., Ursano, R. J., Morganstein, J. C., Kurosawa, M., & Benedek, D. M. (2020). Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: Mental health consequences and target populations. *Psychiatry and clinical neurosciences, 74*(4), 281.

Sun, L., Sun, Z., Wu, L., Zhu, Z., Zhang, F., Shang, Z., ... & Liu, W. (2020). Prevalence and risk factors of acute posttraumatic stress symptoms during the COVID-19 outbreak in Wuhan, China. *MedRxiv, 10*(03), 06-20032425.

Urooj, U., Ansari, A., Siraj, A., Khan, S., & Tariq, H. (2020). Expectations, fears and perceptions of doctors during Covid-19 pandemic. *Pakistan journal of medical sciences, 36*(COVID19-S4), S37.

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International journal of environmental research and public health, 17*(5), 1729.

Wheaton, B., & Montazer, S. (2010). Stressors, stress, and distress. *A handbook for the study of mental health: Social contexts, theories, and systems*, 2, 171-199.

Xiao, H., Zhang, Y., Kong, D., Li, S., & Yang, N. (2020). The effects of social support on sleep quality of medical staff treating patients with coronavirus disease 2019 (COVID-19) in January and February 2020 in China. Medical science monitor, *international medical journal of experimental and clinical research, 26*, e923549-1.

Xu, X., Chen, P., Wang, J., Feng, J., Zhou, H., Li, X., ... & Hao, P. (2020). Evolution of the novel coronavirus from the ongoing Wuhan outbreak and modeling of its spike protein for risk of human transmission. *Science China Life Sciences, 63*, 457-460.

Yaseen, Z., Jathol, I. & Muzaffar, M. (2020). Covid-19 and its Impact on South Asia: A Case Study of Pakistan, *Global International Relations Review*, III(I), 20-26

Zarnab, & Muzaffar, M. (2023). Exogenous Shock and Citizen's Satisfaction with Government Policies: A Functional Data Analysis Approach to Investigate the Role of Previous Financial Crisis and COVID-19. *Pakistan Social Sciences Review*, *7*(2), 34–45.