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A Qualitative-Quantitative Analysis Of The Psychological Impact Of Coronavirus (Covid-19) Pandemic On The Healthcare Professionals

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Abstract

COVID-19 pandemic has emerged as a global health emergency. It poses a serious challenge to healthcare professionals since they provide healthcare facilities to affected population in extremely stressful circumstances, which may affect their psychological wellbeing. Keeping this in mind, this study was conducted to understand the psychological impact of COVID-19 pandemic on healthcare professionals. Following PRISMA protocol, all research papers published between January 2020 and May 2020 were searched in databases like, e.g., Pub-Med, Science Direct and Google-Scholar databases. After screening through proper inclusion criteria, only 26 studies were finally selected for detailed analysis. Results revealed that healthcare professionals suffered from a variety of psychological disorders, particularly from depression, anxiety, and sleep problems. There were also different predisposing factors that have increased the risk of such adverse psychological symptoms among healthcare professionals. And to deal with such symptoms, the

healthcare professionals had adopted different coping strategies. The review concludes that COVID-19 pandemic has a severe impact on the psychological well-being of healthcare professionals, therefore, a broad range of interventions are required for mitigating adverse psychological impact of COVID-19 pandemic among healthcare professionals.

Keywords: COVID-19-Pandemic; Healthcare Professionals, Psychological Outcomes, Mental Health

1. Introduction

The threat from different infectious diseases is not new (Huigang et al., 2020). In the past 25 years humans have faced several viral infections, e.g., Severe Acute Respiratory Syndrome in 2003 and Middle East respiratory syndrome in 2012 (Dyall et al., 2017). In December 2019 a new viral infection emerged in Wuhan, China, which was officially declared as COVID-19 Pandemic by the World Health Organization on 11th March 2020 (WHO, 2020). As of 20th May 2020, this virus has infected around 4.99 million cases over 188 countries, resulting in more than 324,970 deaths (Worldometer, 2020). Global outbreaks like the COVID-19 pandemic not only impede the social lives of general public through socially disruptive measures like lockdowns or quarantine (C. Wang, Pan, et al., 2020), but it can also pose a challenge to healthcare professionals, especially to those who are working at epicenters of outbreak (Zhang, Liu, Xiang, Li, Zhao, et al., 2020). Due to increasing number of patients, the healthcare professionals face extraordinary workloads that can cause physical and mental exhaustion (Rana et al., 2020). Healthcare professionals often work with inadequate protective equipment that create fear of getting infection (Newman, 2020). Beside this, they have to make ethically difficult decisions rationing of care under resource and capacity constraints (Rosenbaum, 2020). All such factors have detrimental effects on the psychological wellbeing of healthcare professionals.

In such a situation, special interventions, e.g., capacity building training, social support and self-control measures are required for enhancing the psychological resilience of healthcare professionals (Ho et al., 2020). Hospital administrations should provide a conducive working environment to its healthcare professionals by carefully assigning working shifts, with a provision of food, resting breaks, and decompression time (Adams & Walls, 2020). Moreover, the hospitals should also provide adequate protective equipment to its staff, so that the fear of getting infection could be controlled (Ehrlich et al., 2020). All such interventions can help the healthcare professionals to combat the emotional and psychological effects of COVID-19 pandemic.

The existing literature documents different reviews on the psychological effects of COVID-19 pandemic among different populations, e.g., Rajkumar (2020) and Spoorthy et al. (2020) conducted short reviews on mental health symptoms and interventions of general public and healthcare professionals during the COVID-19 pandemic. Similarly, Pappa et al (2020) did a systematic review the prevalence of depression, anxiety, and insomnia among healthcare workers during COVID-19 pandemic. However, to the best of our knowledge, we could not trace any comprehensive review on psychological impact of COVID-19 pandemic on healthcare

professionals. Likewise, there are limited empirical studies on this topic. It means that researchers have not yet fully discovered the mental health challenges faced during this outbreak. Such situation can impair the coping capacities and preparedness of healthcare institutions (Gilbert et al., 2020) and also weaken the resilience of healthcare professionals (Santarone et al., 2020). Therefore, it is very crucial to understand the adverse psychological impact of COVID-19 pandemic among healthcare professionals. And for this reason, a recent research position paper in "The Lancet Psychiatry" has called mental health scientists to explore psychological effects of the COVID-19 pandemic (Holmes et al., 2020). Keeping in mind this gap, the current review will find answer to following questions:

1. What is the psychological impact of COVID-19 pandemic on the healthcare professionals? And how this impact has been clinically assessed?
2. Which type of healthcare professionals are suffering from the psychological impact of COVID-19 pandemic? And in which location?
3. Which predisposing factors are likely to make healthcare professionals vulnerable to psychological impact of COVID-19 pandemic?
4. What kind of interventions, strategies and protective measures were adopted by the healthcare professional to cope with psychological impact of COVID-19 pandemic?

2. Methodology

2.1 Reporting Standard

This study was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) protocol outlined by the PRISMA Group. The PRISMA checklist (attached as supplementary File.1) and PRISMA Flow Diagram, seen as Figure.1 have been followed and included.

2.2 Study Registration

This systematic review has been registered with the International Prospective Register for Systematic Reviews (PROSPERO) having registration number CRD42020187428.

2.3 Search Strategy

This review aimed to include all research papers published between January 2020 and May 2020 on the psychological impact of COVID-19 pandemic on the healthcare professionals. For this purpose, databases like Pub-Med, Science Direct, and Google Scholar were searched. The following key terms and phrases were used: ("mental health COVID-19", "healthcare workers COVID-19", "doctors COVID-19", "nurse COVID-19", "mental health of doctors in COVID-19", "psychological effects of COVID-19 among healthcare professionals" "anxiety, depression, stress COVID-19" and "anxiety, depression, stress among healthcare professionals COVID-19".

2.4 Inclusion and Exclusion Criteria

The population of this review consisted of healthcare professionals, for example, medial doctors, dentists, nurses, paramedic staff, pharmacists, and midwives. This review included studies that were published: 1) between January 2020 and May 2020; 2) in English language; 3) in peer reviewed journals, since publication bias can become a threat to the validity of systematic review. Study types include 4) cross-sectional studies, comparative studies, clinical studies, randomized controlled trials, quasi-randomized controlled trials; and 5) both quantitative and qualitative studies. This review excluded 1) duplicate studies; 2) case studies, pilot studies, protocols, and registered but incomplete studies; 3) studies with poor methodological quality; 4) Studies on healthcare students; and 5) studies on general population, although such studies have included healthcare professionals, however results are mixed, and cannot be specifically generalized over healthcare professionals.

2.5 Quality and Risk of Bias Assessment

Quality and risk of bias assessment is multi-dimensional process (Higgins & Altman, 2008). In the present review, quality assessment of the selected studies was done according to the four quality indicators suggested by Dixon-Woods et al (2006) and six quality indicators advised by Buckley et al (2009).

2.6 Data Extraction

Two independent reviewers were assigned the task of searching and extracting relevant data from the finally selected studies. Data were extracted according to the research questions of study. Selected studies were thoroughly read by the reviewers and following data were extracted: 1) Title of study; 2) Population and sample; 3) Participants details, like type of healthcare professionals; 4) Participants' age & gender; 5) Location of study; 6) Psychological symptoms experienced; 7) Assessment or diagnostic tools used; 8) Protective measures adopted; 9) Potential Risk factors; 10) Copying strategies or interventions adopted

3. Results

3.1 Search, screening, and selection of studies

A rigorous "search and screening process" was carried out to ensure the selection of relevant studies. For this purpose, two reviewers were appointed, and three electronic databases were assigned to them. Reviewers searched published studies according to eligibility criteria by entering keys terms and phrases into the selected online databases. Reviewers also cross-checked studies in screening process and in case any disagreement, the final decision was made by mutual discussion. The PRISMA Flow Diagram (Figure. 1) shows that a total of 2918 studies were identified. The reviewers reviewed titles of 2918 studies and removed 2189 duplicated and irrelevant studies, resultantly 729 studies were left. In the next step, the reviewers studied the abstracts of 729 studies and checked its other contents and found that 612 studies were not meeting the inclusion criteria. In this way 117 studies were left. In the final step, detailed texts of 117

studies were reviewed and 91 studies were removed. In this way total 26 studies were finally selected for detailed quantitative analysis and synthesis.

3.2 Quality and Risk of Bias Assessment

The quality assessment was performed according to the ten quality indicators as mentioned in the previous section 2.5. Two reviewers performed quality assessment through a checklist in which quality indicators were mentioned in rows, whereas studies were cited in columns. The reviewers appraised each study according to quality indicators on a scale of Yes, No, Not Applicable and Not Mentioned. The results showed that all of twenty-six selected studies possessed acceptable quality because most of the quality indicators were present in these studies. Detail of quality assessment (attached as supplementary File.2)

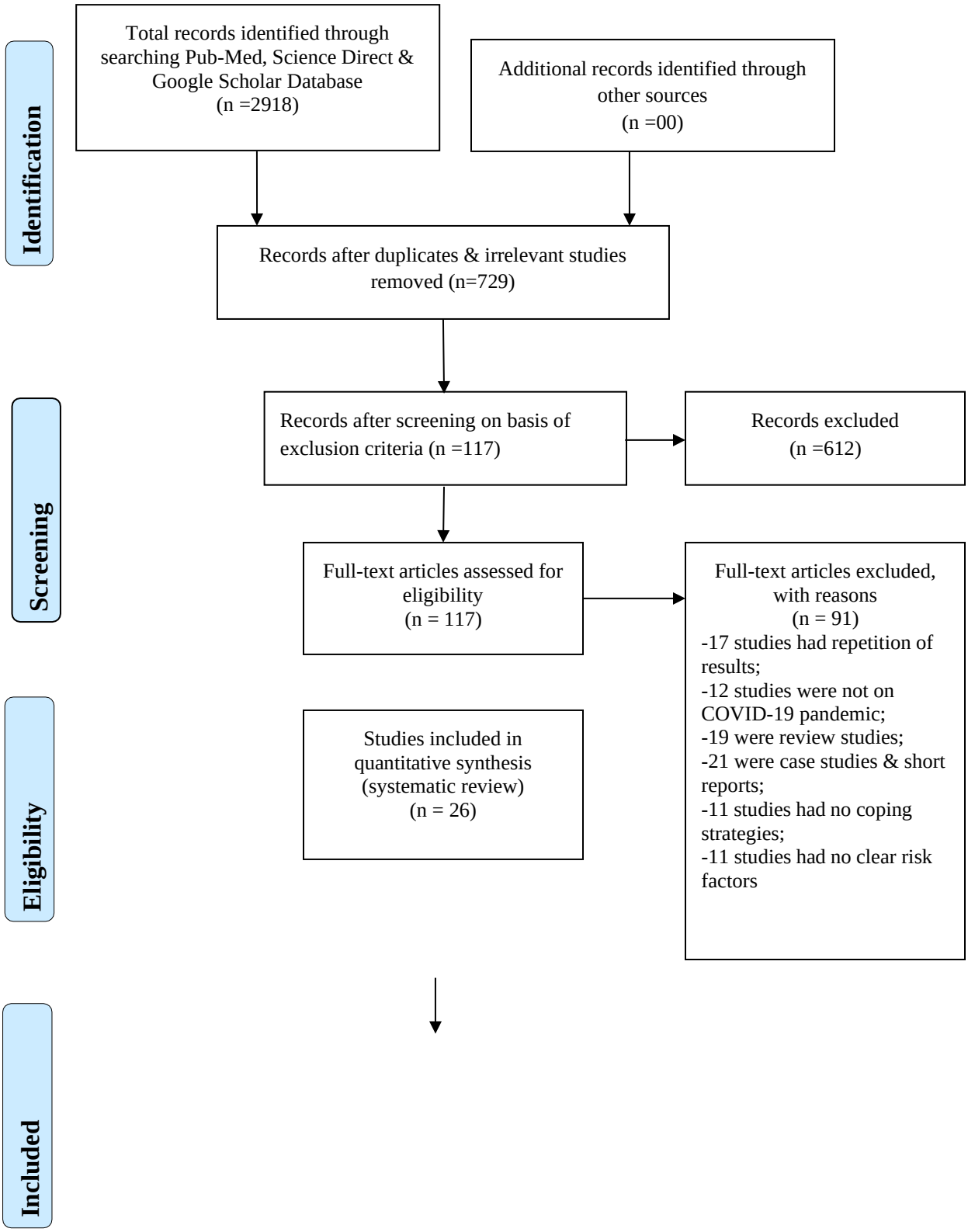


Fig. 1 PRISMA Flow Diagram for studies selection

3.3 Characteristics of selected studies

The selected studies were published between 1st January 2020 and 10th May 2020. These studies were carried out in seven different countries, namely Singapore & India (Chew et al., 2020), Iran (Zhang, Liu, Jahanshahi, Nawaser, Li, et al., 2020; Zhang, Liu, Jahanshahi, Nawaser, Yousefi, et al., 2020), Italy (Bettinsoli et al., 2020), Switzerland (Weilenmann et al., 2020) and Israel (Shacham et al., 2020). While most of the studies (77%) were conducted in China. The number of respondents ranged from minimum n=20 (Sun et al., 2020) to maximum n=5062 (Zhu, Xu, et al., 2020). The age of respondents ranged from 18 years (C.-Y. Liu et al., 2020) to 74 years (Shacham et al., 2020).

3.4 Psychological Outcomes of COVID-19 pandemic

The psychological impact of COVID-19 pandemic is explained with help of symptoms clusters. In the first cluster, five studies have reported the symptoms of anxiety, depression, and psychological distress, see Table 1. In the second cluster, eleven studies have reported the symptoms of anxiety, depression, insomnia (sleep problems), somatization, hostility and obsessive–compulsive disorder. In the third cluster, seven studies have reported the symptoms of anxiety, depression, fear, fatigue, learned helplessness, social dysfunction, phobic anxiety, paranoid ideation, and burnout. Finally, two studies, i.e., Cai, Tu, et al. (2020) and Shacham et al. (2020) reported symptoms of psychological stress; one study, i.e., Liu et al. (2020) reported only symptoms of anxiety and another study, i.e., Xue-Hui et al. (2020) reported only depression symptoms.

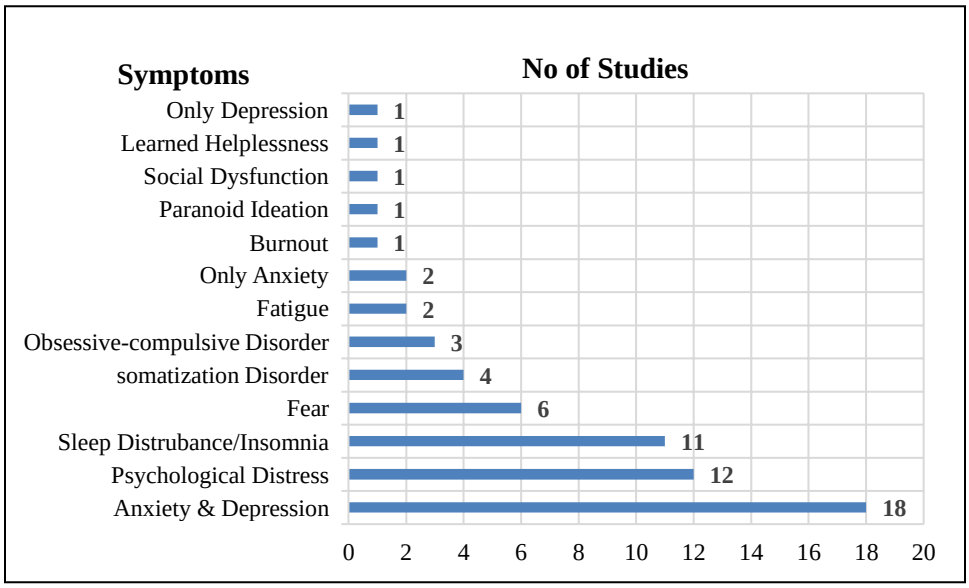
Table 1 Symptoms clusters and diagnostic tools

Symptoms Clusters	Studies
Anxiety, Depression, and Psychological Distress	(Zhang, Liu, Jahanshahi, Nawaser, Yousefi, et al., 2020) (Kang et al., 2020) (Lai et al., 2020) (Bettinsoli et al., 2020) (Zhang, Liu, Jahanshahi, Nawaser, Li, et al., 2020) (Chew et al., 2020)
Anxiety, Depression, Insomnia (Sleep Problems), Somatization, Hostility, and Obsessive–Compulsive Disorder	(Wang, Xie, et al., 2020) (Zhang, Yang, Liu, Ma, Wang, et al., 2020) (Zhang, Wang, Yin, Zhao, Xue, et al., 2020) (Xiao et al., 2020) (Mo et al., 2020) (Qi et al., 2020) (Wu & Wei, 2020) (Kang et al., 2020)

	(Chew et al., 2020) (Cai, Lian, et al., 2020) (Xing et al., 2020)
Anxiety, Depression, Fear, Fatigue, Learned Helplessness, Social Dysfunction, Phobic Anxiety, Paranoid Ideation and Burnout	(Lu et al., 2020) (Sun et al., 2020) (Dai et al., 2020) (Weilenmann et al., 2020) (Zhu, Sun, et al., 2020) (Xing et al., 2020) (Zhu, Xu, et al., 2020)
Psychological Stress	(Cai, Tu, et al., 2020) (Shacham et al., 2020)
Anxiety	(C.-Y. Liu et al., 2020)
Depression	(Xue-Hui et al., 2020)

Findings obtained from this study revealed that most of the healthcare professionals experienced symptoms of anxiety and depression, as clear from Fig.2, total 18 studies reported such symptoms. Other reported symptoms include psychological distress, insomnia, fear, and somatization disorder

Fig. 2 Symptoms distribution according to studies



3.5. Diagnostic Tools Utilized

The adverse psychological symptoms were assessed by different diagnostic tools, see Table 2. The most widely used tools include Patient Health Questionnaire-9/4/2, Generalized Anxiety Disorder Scale-7, Symptom Check-List- 90, and Pittsburgh Sleep Quality Index. Details of all diagnostic tools are given in Table 2.

Table 2 Diagnostic Tools for Assessment of Psychological Symptoms

Diagnostic Tools Utilized	Studies
Patient Health Questionnaire (PHQ-2)	(Zhang, Wang, Yin, Zhao, Xue, et al., 2020)
Patient Health Questionnaire (PHQ-4)	(Zhang, Liu, Jahanshahi, Nawaser, Yousefi, et al., 2020); (Zhang, Liu, Jahanshahi, Nawaser, Li, et al., 2020)
Patient Health Questionnaire (PHQ-9)	(Zhang, Yang, Liu, Ma, Wang, et al., 2020); (Kang et al., 2020); (Lai et al., 2020); (Zhu, Xu, et al., 2020); (Weilenmann et al., 2020);
Generalized Anxiety Disorder (GAD-7) Scale	(Zhang, Yang, Liu, Ma, Wang, et al., 2020); (Zhang, Wang, Yin, Zhao, Xue, et al., 2020); (Kang et al., 2020); (Lai et al., 2020); (Zhu, Xu, et al., 2020); (Weilenmann et al., 2020);
Pittsburgh sleep quality index (PSQI) Athens Insomnia Scale (AIS)	(Wang, Xie, et al., 2020); (Xiao et al., 2020); (Qi et al., 2020); (Wu & Wei, 2020)
Impact of Events Scale-Revised (IES-R) Exposure to COVID-19 Scale Perceptions of threat of COVID-19 Scale	(Zhang, Yang, Liu, Ma, Wang, et al., 2020); (Kang et al., 2020); (Lai et al., 2020); (Zhu, Xu, et al., 2020)
Self-rating depression scale (SDS) Self-rating anxiety scale (SAS) Stress Overload Scale PTSD Checklist-Civilian Version	(Wang, Xie, et al., 2020); (Xiao et al., 2020); (Mo et al., 2020); (Liu et al., 2020); (Xue-Hui et al., 2020); (Zhu, Sun, et al., 2020); (Wu & Wei, 2020)
Symptom Checklist-90 (SCL-90)	(Cai, Lian, et al., 2020); (Zhang, Wang, Yin, Zhao, Xue, et al., 2020); (Xing et al., 2020)
Kessler psychological distress scale (K6) Short-Form Health Scale (SF-12) COVID-19-Related Factors scale	(Zhang, Liu, Jahanshahi, Nawaser, Li, et al., 2020); (Shacham et al., 2020); (Zhang, Liu, Jahanshahi, Nawaser, Yousefi, et al., 2020)
Social Support Rating Scale (SSRS) Perceived Social Support Scale (PSSS)	(Xue-Hui et al., 2020); (Cai, Lian, et al., 2020); (Xiao et al., 2020)
Insomnia Severity Index (ISI)	(Zhang, Yang, Liu, Ma, Wang, et al., 2020); (Zhang, Wang, Yin, Zhao, Xue, et al., 2020); (Kang et al., 2020); (Lai et al., 2020)
General Health Questionnaire (GHQ-12)	(Dai et al., 2020); (Xue-Hui et al., 2020)
Connor-Davidson resilience scale (CD-RISC) Brief Resilience Coping Scale (BRCS)	(Bettinsoli et al., 2020); (Cai, Lian, et al., 2020)

Strengths and Difficulties Questionnaire (SDQ)	
Psychological Stress Questionnaire	(Wu et al., 2020)
Hamilton Anxiety Scale (HAMA) Hamilton Depression Scale (HAMD)	(Lu et al., 2020)
General Self-Efficacy Scale Self-Efficacy Scale (GSES) Coping Self-Efficacy Scale (CSES)	(Shacham et al., 2020); (Xiao et al., 2020); (Bettinsoli et al., 2020)
Maslach Burnout Inventory (MBI)	(Weilenmann et al., 2020)
COVID-19 perception Scale Stress Perception Scale Stress Reduction Factors Scale	(Cai, Tu, et al., 2020)
Physical Symptoms Scale-16	(Chew et al., 2020)

3.6. Types of Healthcare Professionals and Location

Healthcare professionals included doctors, dentists, nurses, and paramedical staff, etc, and they worked in seven different countries, see Table 3.

Table 3 Symptoms clusters reported in selected studies

Types of Healthcare Professionals	Location	Studies
Doctors and Nurses only	China, Switzerland	(Wang, Xie, et al., 2020); (Lu et al., 2020); (Zhang, Wang, Yin, Zhao, Xue, et al., 2020); (Kang et al., 2020); (Mo et al., 2020); (Lai et al., 2020); (C.-Y. Liu et al., 2020); (Xing et al., 2020); (Qi et al., 2020); (Xue-Hui et al., 2020); (Zhu, Sun, et al., 2020); (Weilenmann et al., 2020)
Doctors, Nurses, Radiologists, Pharmacists, Physiotherapists, Allied Healthcare Workers and Paramedical Staff	China, Iran, Italy, Singapore, and India	(Zhang, Liu, Jahanshahi, Nawaser, Yousefi, et al., 2020); (Cai, Lian, et al., 2020); (Zhang, Yang, Liu, Ma, Wang, et al., 2020); (Wu et al., 2020); (Dai et al., 2020); (Zhu, Xu, et al., 2020); (Bettinsoli et al.,

		2020); (Cai, Tu, et al., 2020); (Chew et al., 2020); (Wu & Wei, 2020)
Dentists	Israel	(Shacham et al., 2020)
Nurses only	China	(Sun et al., 2020)

3.5 Predisposing Factors

The selected studies have reported multiple predisposing factors, which are likely to increase the risk of adverse psychological outcomes among the healthcare professionals during COVID-19 pandemic. These factors can be divided into personal & family factors, clinical factors, work related factors, protection related factors, media related factors and psychosocial factors, as clear from Table 4.

Table 4 Predisposing factors of adverse psychological outcomes

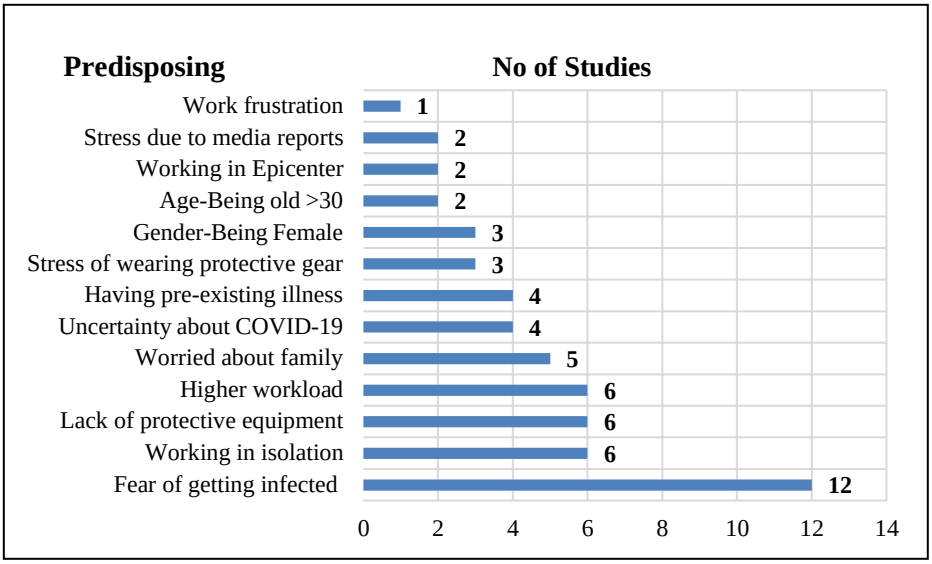
Predisposing Factors	Studies
Personal and Family Factors • Gender (Being Female)* • Age (>30)*	(Zhang, Wang, Yin, Zhao, Xue, et al., 2020); (Shacham et al., 2020); (Lai et al., 2020); (Zhang, Liu, Jahanshahi, Nawaser, Li, et al., 2020); (Chew et al., 2020)
• Being only son/daughter in family*	(Wang, Xie, et al., 2020); (Mo et al., 2020)
• Family members or relatives suspected or confirmed to be infected*	(Zhu, Xu, et al., 2020)
Clinical Factors • Self-exposure/ contact with COVID-19 patients or already being infected* • Having pre-existing organic diseases* • Fear of contacting virus*	(Lu et al., 2020); (Kang et al., 2020); (Zhang, Liu, Jahanshahi, Nawaser, Yousefi, et al., 2020); (Wu et al., 2020); (Shacham et al., 2020); (Zhang, Wang, Yin, Zhao, Xue, et al., 2020)
Work Related Factors •Working in isolated wards/offices*	(Zhang, Yang, Liu, Ma, Wang, et al., 2020); (Lu et al., 2020); (Zhu, Xu, et al., 2020)
•Frustrated with unsatisfactory results on work*	(Lu et al., 2020)
•Higher work overload with high work intensity* •Long working time per day/ week	(Mo et al., 2020)
•Working in Epicenter* •Working in high affected zones*	(Liu et al., 2020); (Bettinsoli et al., 2020)

• Facing a lack of medical staff, medical equipment, & medical resources • Working in late night shifts*	(Cai, Tu, et al., 2020)**;** (Bettinsoli et al., 2020)
Protection Related Factors • Lack of Personal Protective Equipment*	(Zhang, Liu, Jahanshahi, Nawaser, Yousefi, et al., 2020)**;** (Lu et al., 2020)**;** (Cai, Tu, et al., 2020)**;** (Zhang, Liu, Jahanshahi, Nawaser, Li, et al., 2020)
Media Related Factors • Perceived unhelpfulness of emotional support from social media regarding COVID-19 outbreak* • Hours each day spent on reading information about the COVID-19*	(Zhang, Yang, Liu, Ma, Wang, et al., 2020)
• Uncertainty about future of COVID-19 • Worried about the epidemic would never be controlled* • News & WeChat, etc. report on number of new cases every day	(Lu et al., 2020)**;** (Cai, Tu, et al., 2020)
Psychosocial Factors • Stress of taking care of your infected colleagues	(Cai, Tu, et al., 2020)
• Low self-efficacy*	(Shacham et al., 2020)
• Feel lonely with being isolated from loved ones*	(Lu et al., 2020)

*Statistically significant

The dominant risk factors as shown in Fig.3 include fear of getting infected (mentioned in 12 studies), working in isolation, lack of protective equipment and higher workload. Other potential factors include worried about family, uncertainty about COVID-19 and having pre-existing illness.

Fig. 3 Factors increasing risk of adverse psychological outcomes



3.6 Coping Interventions and Protective Measures

The selected studies have reported multiple coping strategies and protective measures, which had likely decreased the impact of adverse psychological outcomes among healthcare professionals during COVID-19 pandemic. These factors can be divided into personal factors, family, friends & colleague factors, training factors, institutional support factors, social media support factors, professional help factors, and protective measures as clear from Table 4.

Table 5 Coping Interventions against adverse psychological outcomes

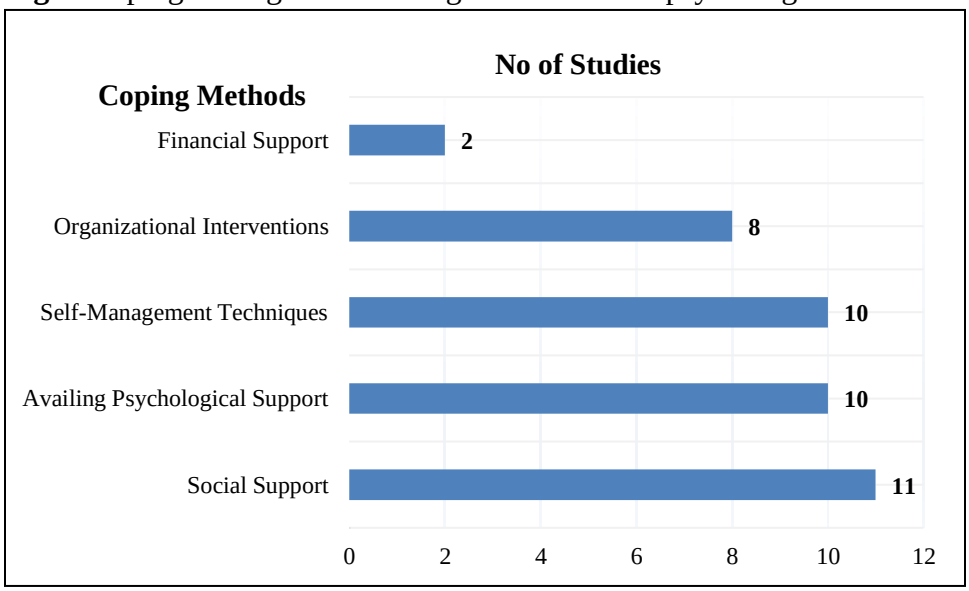
Coping Interventions	Studies
Personal Factors • Possessing Resilience, Tenacity, optimism, and strength for coping stress • Confidence in defeating epidemic, and optimism for end of outbreak • Self-awareness about COVID-19 • Knowledge of psychology • Skills for self-rescue/self-help skills • Higher Self-efficacy • High self-control • Ability of psychological adjustment and self-care • Ability of Emotional Regulations • Regularly doing physical exercise	(Cai, Lian, et al., 2020) (Wu et al., 2020) (Kang et al., 2020) (Shacham et al., 2020) (Xiao et al., 2020) (Sun et al., 2020) (Bettinsoli et al., 2020) (Wu & Wei, 2020)
Family, Friends and Colleagues Factors •Subjective Social Support from close friends	(Cai, Lian, et al., 2020) (Kang et al., 2020) (Shacham et al., 2020)

• Subjective Social Support from close friends in shape of financial assistance • Seek help from family and friends • Committed relationship provide support • Social interactions with family and colleagues • Perceived support from employer or boss • Get together with family for coping stress	(Xiao et al., 2020) (Mo et al., 2020)(Xing et al., 2020) (Weilenmann et al., 2020) (Zhu, Sun, et al., 2020)
Training related Factors • Regularly reminding medical staffs to take care of themselves • Promotion of human-oriented culture • Imparting protection training • Training for readiness in public health emergencies	(Wu et al., 2020) (Lu et al., 2020) (Dai et al., 2020) (Xing et al., 2020)
Institutional Support Factors • Care provided by hospital administration • Work shift arrangements • Sufficient logistical support • Comfortable accommodations • Hospital provides effective biosafety materials • Hospital provides guidance in infection prevention • Hospital gives extra financial support • Hospital provides free lunch	(Zhu, Xu, et al., 2020) (Cai, Tu, et al., 2020)
Media Support Factors • Psychological support from news coverage and social media • Psychological publicity in media and push messages on mental health • Psychological resources available through media	(Zhang, Yang, Liu, Ma, Wang, et al., 2020) (Kang et al., 2020)
Professional Help Factors • Psychological crisis intervention • Seeking psychological consultation • Seeking One to one counselling • Seeking dedicated counselling	(Wu et al., 2020) (Lu et al., 2020) (C.-Y. Liu et al., 2020) (Xue-Hui et al., 2020) (Wu & Wei, 2020)

• Drug interventions and treatment, e.g., using Hypnotics	
Protective Measures • Regularly wearing Personal Protective Equipment • Giving infection prevention training to staff • Strict adherence to protective measures, such as regular hand washing, wearing face masks, and protective clothing, etc. • Choose single mode of travel, e.g., self-driving, and avoid public transportation, e.g., subways • Adopting a positive coping style as a protective factor	(Zhang, Liu, Jahanshahi, Nawaser, Yousefi, et al., 2020) (Zhang, Yang, Liu, Ma, Wang, et al., 2020) (Cai, Tu, et al., 2020) (Zhu, Sun, et al., 2020)

As clear from Fig.4, the most adopted strategies included social support, availing psychological support, and applying self-management techniques. Other coping strategies include organizational interventions and financial help either from friends or employer.

Fig. 4 Coping Strategies decreasing risk of adverse psychological outcomes



4. Discussion

This study has qualitatively and quantitatively explored the psychological impact of COVID-19 pandemic among healthcare professionals. The findings of this study revealed that healthcare professional experienced a broad range of mental health symptoms, moreover, many predisposing factors were involved in maximining the risk of such symptoms. The healthcare professional

adopted different coping strategies for dealing with the adverse psychological impacts of COVID-19 pandemic. This study has successfully highlighted the significance of the psychological wellbeing of healthcare professionals, who have been working during the COVID-19 pandemic.

Surprisingly, there are limited number of empirical studies available on the psychological impact of COVID-19 pandemic among healthcare professionals. Perhaps because it will take time to determine the long-term psychological impact of COVID-19 pandemic (Rajkumar, 2020). It means that researchers have not yet fully discovered the nature of mental health challenges faced by the healthcare professionals in this outbreak. It is therefore very crucial to fully understand the psychological impact of COVID-19 pandemic among healthcare professionals.

Findings obtained from this study revealed that most of the healthcare professionals experienced symptoms of anxiety and depression. Similar results have been reported by Pappa et al. (2020) in their systematic review on prevalence of depression and anxiety among healthcare workers during COVID-19 pandemic. Other frequently reported symptoms include psychological distress and insomnia. Psychological distress is experienced after exposure to unwanted events that are uncontrollable (Randy & David, 2008), whereas constant stress can cause chemical imbalance in human body, which may lead to disruption of circadian rhythm (Steinach & Gunga,2020). During COVID-19 several events have acted as potential sources of stress for the healthcare professionals, including, WHO's official confirmation of human-to-human transmission of coronavirus (WHO, 2020); critical supply shortage of protective and lifesaving equipment (Ranney et al., 2020); and working in isolation with extreme workloads (Liu et al., 2020). Work related stressors are often associated with symptoms of anxiety and depression (Lu et al., 2020). Similar psychological responses were previously observed during the SARS-2003 outbreak (Chong et al., 2004).

The healthcare professional experienced other symptoms, including fear, somatization disorder, fatigue, and compulsive disorder, etc. It was becasue healthcare professionals live in constant fear of getting infection (Liu et al., 2020). Such fear ultimately triggers symptoms of obsession and somatization (Faranda, 2020). COVID-19 will continue to cause emotional suffering among healthcare professional, and organizations like UNESCO (UNSECO, 2020) and University of Surrery (Surrery, 2020) are collecting global data on COVID-19, which may help in determining the psychological impact of COVID-19 in the future.

The adverse psychological symptoms were assessed through wide range of screening tools. These symptoms-based rating scales assign quantitative or qualitative values to the patients' feelings, emotions, and behaviors for detecting mental health problems (Maust et al., 2012). However, question arises whether these screening tools could be successfully used during COVID-19 pandemic? Since we need psychometrically tested and culturally adapted tools for detecting mental health problems (Arpaci et al., 2020). Moreover, most of these tools were developed for research purposes and it requires extensive training prior to use, which may undermine their use in clinical settings (Newson et al., 2020). Included studies had used Patient Health Questionnaire-9/4/2, Generalized Anxiety Disorder Scale-7, Symptom Check-List- 90, and Pittsburgh Sleep Quality Index. These tools are psychometrically validated and tested across different countries

(Baer & Blais, 2009); hence, it is expected that they had provided accurate assessment of the psychological outcomes among healthcare professionals during COVID-19 pandemic.

The study has also identified several predisposing factors that had probably increased the risk of adverse psychological outcomes among healthcare professionals. The dominant risk factors include fear of getting infected, working in isolation, lack of protective equipment and higher workload. Healthcare professionals who are treating patients with coronavirus are at high risk of getting infected as compared to general public and their vulnerability is further increased if they donot have enough protective equipment (Neto et al., 2020). Healthcare professionals also face extreme world load, since number of patients visiting hospital increases with alarming rate. All suchfactors create stress and significantly increase the risk of adverse psychological outcomes among healthcare professionals (Lu et al., 2020).

Other potential risk factors include worried about family, uncertainty about COVID-19 and having pre-existing illness. Healthcare professionals are very worried of bringing the virus to their families (Wu et al., 2020) and it remain all times in the mind of healthcare professionals wondering how to keep their families safe during COVID-19 pandemic? (Sara Berg, 2020). Healthcare professionals also feel stressful due to extreme uncertainty regarding effective disease control of COVID- 19 outbreak and they feel worried that the epidemic might never end (Zhang, Yang, Liu, Ma, Wang, et al., 2020). In such uncertainty, the healthcare professionals find themselves extremely helpless, especially those who already have a pre-existing illness or old age, or working in epicenter, since such factors can increase the perceived vulnerability of getting the coronavirus. Finding themselves vulnerable can cause adverse psychological outcomes among healthcare professionals (Wingfield & Taegtmeyer, 2020).

Finally, this study found that healthcare professionals adopted different strategies for coping with the adverse psychological impact of COVID-19 pandemic. Most adopted strategies included social support, availing psychological support, and applying self-management techniques. Perceived social support from family, friends, colleagues, and supervisor can buffer the negative effects of stress (Shi et al., 2020) and it can also help the healthcare professionals to relieve their feeling of anxiety, and improve their sleep (Xiao et al., 2020). Similarly, availing psychological support from professional Psychologists or Psychiatrists through counselling or drug therapy can also help in reducing the negative symptoms (Jiang et al., 2020). However, the effective method is self-management or self-control, since those healthcare professionals who had higher level of self-control and tolerance were in much better position to fight stress (Singh & Jain, 2017). Researchers suggest that the adverse psychological symptoms can be managed both through social support, availing professional medical help and self-management techniques, since these all works interchangeably. Social support can reduce the perception of stress (Chang et al., 2018), moreover, it also improves self-efficacy and resilience (Wang et al., 2018). Similarly, seeking professional medical help is effective especially in pathological anxiety or depression (McNair & Bush, 2016).

Other coping strategies include organizational interventions and financial help either from friends or employer. Healthcare institutions should give stress coping trainings to its staff, moreover, staff should be trained in biosafety (Dai et al., 2020). Moreover, hospitals should try to

arrange their work shifts, which can save staff from workload and undue pressure. Hospitals can also provide logistical support and proper accommodation to its staff (Zhu, Xu, et al., 2020). Some hospitals also provide extra financial compensations in shape of salary increase or additional bonus (Cai, Tu, et al., 2020). All such organizational interventions can build trust in hospital, which ultimately gives peace of mind to the healthcare staff. In this way the healthcare professionals may less suffer from the adverse psychological symptoms.

Findings of this study has yielded several significant implications. This study has provided insights into adverse psychological outcomes of COVID-19, which can guide the scientists, healthcare professionals and administration of hospitals to exactly understand the psychological impact of COVID-19. The scientists can work on improving the existing screening tools or develop new screening tools for diagnosing psychological symptoms of affected population. And off course it can be done by either upgrading the existing theories on psychological problems or formulating new theories on etiology of psychological disorders with reference to COVID-19. Here immediate research priorities for scientist are to accurately diagnose, monitor and finally report the rates of psychological problems during COVID-19. Moreover, novel population based epidemiological surveys should be established both with general population and healthcare professionals. Such detailed investigation can help in devising effective mechanism for successful control of psychological problems during this pandemic.

The healthcare professionals can understand the nature of psychological disorders, which they might develop while performing duties during COVID-19 pandemic. The findings of this study revealed that a major adverse impact of COVID1-19 is increased loneliness and social isolation, which provoked feelings of anxiety, depression, and insomnia, etc. So, with a better knowledge about their mental health the healthcare professionals can better protect themselves from the adverse psychological outcomes, by adopting effective coping strategies and availing best psychological support. In these challenging times, the healthcare professionals should be in better position to serve humanity, which demands a focus on their own physical and mental fitness.

The administration of hospital can understand that frontline healthcare staff experience more stress, therefore, they can devise mechanism for providing a conducive working environment for its staff. Healthcare institutions can also facilitate medical staff through an online tele-medicine system, such as digital clinics for delivering mental health services to the vulnerable population. At governmental level work should be done on formulating long-term strategic well-being programs that can protect the well-being of healthcare staff in novel way. One of important findings of this study is about positive and negative effects of media. Since people seek trusted information via mass media, so government should understand the role of media in either optimizing positive psychological well-being or in amplifying distress. Long-term priorities for government are to learn lessons from this pandemic and effectively plan for future pandemics, especially by giving research funding to medical research.

Strengths of this study include inclusion of twenty-six research studies from three major databases, that allowed the examination of more than ten psychological disorders and its associated risk factors in seven countries across the world. Moreover, a wide range of coping interventions

were also examined. All such efforts yielded diverse findings about the psychological impacts of COVID-19 pandemic, which are to best of our knowledge for first time explored in a systematic review. On the other side, the limitations of this study include inclusion of more studies from China, which can affect generalizability of our findings, however, fact is China was severely affected by COVID-19 that is why majority of studies were conducted in China. Moreover, except one study that was longitudinal, rest of selected studies were cross-sectional, therefore, it was unable to understand changes in mental health of with passage of time. Finally, since no meta-analyses were performed, therefore, no robust quantitative analyses were performed.

5. Conclusion

This study concludes that COVID-19 pandemic has a severe impact on the psychological well-being of the healthcare professionals. Such impact was due to the wide range of predisposing factors that have increased the risk of adverse psychological symptoms among healthcare professionals. And to deal with such symptoms, the healthcare professionals had adopted different coping strategies. In short, the healthcare professionals, individual scientists, and administration of hospitals should work jointly for improving the mental health of frontline medical staff through broad range of interventions aiming at on-time assessment and monitoring of the psychological disorders for ensuring the psychological well-being of the frontline medical staff during and after COVID-19 pandemic.

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