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Review Article

Psychological Impacts among Health Care Personnel during COVID-19 Pandemic: A Systematic Review

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Abstract

Introduction: The COVID-19 outbreak is a health emergency, in which health care personnel (HCP) face psychological consequences, working as frontline workers. Therefore, we conducted this study to find out associated psychological impacts among HCP during COVID-19 pandemic.

Methods: This systematic review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guideline. The reviewed studies were searched from PubMed, MEDLINE, CINAHL and Google scholar electronic database using the Medical Subject Heading (MeSH) terms.

Results: We searched through 2676 articles**,** 19 of which were finally included, most of them were cross-sectional and descriptive studies with 12910 participants. HCP were found to be exposed to a variety of psychological problems; anxiety symptoms were reported in 33% (3081 of 9269), depression 28% (2681 of 9487), post-traumatic stress disorder (PTSD) 41% (2933 of 7167), sleep problems 26% (903 of 3442), stress 13% (487 of 3496) and fear 67.3% (392 of 582). The severity of impacts was often mild to moderate. The nurses were twice as likely to develop these symptoms. The factors associated with psychological impacts were fear of infection to self and family members, lack of resources and facilities at workplace, demanding work conditions, working closely with COVID-19 clients in intensive care unit and pre-existing medical and psychological problems.

Conclusion: Psychological impacts was mild to moderate among majority of HCP during COVID-19 pandemic. The outcome of this review is to provide some utilitarian information for making supportive policies and strategies to improve the psychological wellbeing of frontline HCP during this pandemic.

Introduction

Severe acute respiratory syndrome coronavirus -2 (SARS-CoV-2) infection never spared any of the country across the globe, affected more than 220 countries around the world. Globally approximately 189 million confirmed cases found with more than four million deaths and nearly three crore confirmed cases with four lakh deaths were reported in India till May 2021 by COVID-19 virus, originated from Wuhan city China.[1] Government of all countries continuously trying to flatten the curve but it was remained same because of difference of geographic disease burden, requirement of physical distance in between country and outside the country also. To reduce the impacts or spread of SARS-CoV-2, many public health efforts and multilevel emergency response plans were activated and containment and mitigation measure are implemented. Unfortunately, these measures are helpful in limiting the transmission of COVID -19 pandemic also contributing in negative effects on mental health of individuals.[2]

A physical and mental health impact was reported among general population as well as among health care workers, who were in direct contact with infected patients. Frontline health care workers were continuously working with COVID-19 positive patients so they were more prone to psychological distress compared to general population.[3]

There were the various reasons of psychological problems among health care workers, such as containment red zone areas which includes strict quarantine and need to adhere social distancing, as well as high mortality, insufficient medical supplies, fears of infection, uncertain quarantine duration, stigma and discrimination. Along this less support from public or government and adopted negative coping strategies leads many psychological and mental health problems among health care personnel (HCP).[4]

During SARS pandemic 2003 in Hong Kong nearly 68% health care workers showed high level of stress and 57% experienced psychological distress.[5] It was evident that health care workers face many challenges and psychological impact during Middle East respiratory syndrome pandemic in 2015.[6]

Health care workers are integral to the global response to current pandemic. They play a significant role in every setting to manage the current situation. The mental and physical health crisis among the health care workers increasing rapidly and it is becoming itself epidemic. The health care workers are often tend to feel that every new COVID-19 diagnosis means long working hours, less sleep, more mental and physical stress which can lead to weakened immune system.[7]

Thus, as above literature illustrate that, the cases of psychological impacts were increasing at the time of pandemic due to various reason or lack of intervention or support among health care workers. From the beginning of pandemic, many studies have been conducted on psychological impact of COVID-19 among the health care workers, but have not been sufficiently explored. Therefore, in this systematic review researcher strived to integrate the findings of different study and throw a light on prevalence, severity, nature and associated factors of psychological impact faced by the health care workers during this pandemic. So, considering an important health issue, the researcher undertook this systematic review with aim to highlight psychological impacts among HCP during COVID-19 pandemic. It was anticipated, the outcome of this review to provide some utilitarian information for making supportive policies and strategies to improve the psychological status of HCP in frontline during the pandemic.

Materials and Methods

This systematic review was carried out according to Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) check list. Also Joanna Briggs Institute appraisal tool was used.[8] We performed a systematic literature review to identify all international research related to psychological impact of COVID-19 among HCP.

We aimed to identify original research pertaining to COVID-19 outbreak psychological impact from Jan. 2020 to April 2021. To obtain relevant article, we searched PubMed, MEDLINE, CINAHL and Google scholar electronic database using the Medical Subject Heading (MeSH) and keywords were 'COVID-19', 'coronavirus', 'SARS', 'Health care personnel', 'health care workers', 'health workers', 'doctor', 'nurses', 'medical', 'allied health', 'psychological impacts', 'post-traumatic stress disorder' 'anxiety', and 'depression', 'insomnia', 'psychological' 'mental illness', (COVID-19* OR Psychological impacts* OR Health care personnel* OR Anxiety* OR Insomnia OR Mental illness). The reference list of selected articles also examined to find other relevant studies.

The research studies included in this systematic review were 1. Primary data with individual study; 2. Focusing on HCP (including nurses, doctors, allied health personals, pharmacist, technician's laboratory workers); 3. Reporting psychological impact outcome (depression, anxiety, insomnia, post traumatic syndrome and stress) from original research; 4. Publish in peer review journals; 5. Be written in English; 6. Letters commentaries, editorials, reviews and grey literature were excluded in this study.

The two researchers (MKB, RVA) extracted data from all the relevant included studies independently. Then data were re-checked and disparity were solved through concord (AJ, RVA). The researchers (MKB, RDA) prepared a summary of selected variable included first author and publication year, country, investigated topic, HCP category involved, sample size, psychological impact outcome, quality assessment and key findings.

Results

The initial literature search through electronic database and manual yielded 2680 articles, of which 19 relevant articles were included in this systematic review (Figure 1).

The systematic review consists of nine cross-sectional studies, five descriptive studies, three exploratory studies, whereas, one observational cohort study and one longitudinal study. The number of total participants in these studies were 12 910 from different categories of HCP. As per population concern, in the cross-sectional studies, total participants number range between 118-1139. Furthermore, the number of participants ranged in descriptive studies were 128-1330, in exploratory studies was 133-933, in longitudinal study and observational cohort study 2195 and 472 respectively. Out of total 19 studies[4,9-26], four from India, three from China, two studies each from Singapore, Oman, Saudi Arabia and Turkey and rest of the studies one each from Nepal, Bangladesh, south east Ireland, and Italy (Table 1).

Most of the studies 17 (89.47 %) investigated psychological impacts among more than one HCP categories, whereas, one study each directly focused on doctor and nurses. The psychological impact was assessed by using one or more several validated measures i.e., Impact Event Scale Revised (IES-R) used by 10 studies, generalized anxiety disorder (GAD) scale used by seven studies, Physical Health Questionnaire (PHQ) used by seven studies. Furthermore, Depression Anxiety Stress Scale -21 (DASS-21) used by six studies and Insomnia Severity Index (ISI) used by three studies (Table 1).

The risk and quality of the cross-sectional studies and other studies were assessed with Joanna Briggs Institute (JBI)[8] appraisal tool, in which majority of studies scoring five or higher whereas, the most of studies indicated low risk of bias (Table 2).

Psychological Impact among HCP

This systematic review identifies the five major psychological impacts: anxiety, depression, post-traumatic stress disorder (PTSD), stress and insomnia on HCP during COVID-19 pandemic. Whereas, only one of the selected study findings showed that, the overall mental disturbance, in which 36% (358 of 994) HCP had sub

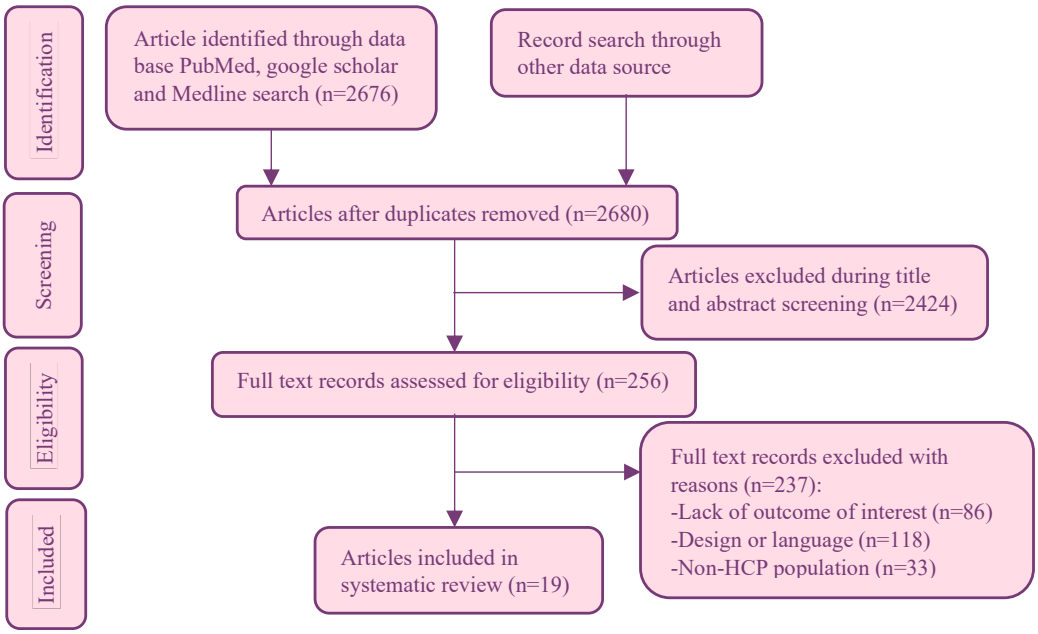

Figure 1. PRISMA flowchart showing the screening, exclusion and inclusion criteria

threshold mental disturbance whereas 6.2% (62 of 994) had severe mental disturbance.[9]

Anxiety

Anxiety was experienced as a most common psychological impact of COVID-19 pandemic among the HCP. In addition, from the selected studies, the anxiety was identified amongst 33% (3081 of 9269) HCP.[4,10,11,13,15,18,21,23-26] Furthermore, three studies exclusively reported the level of anxiety among HCP, in which 45% (935 of 2085) HCP had minimal level, 32% (660 of 2085) had mild, 17% (360 of 2085) had moderate and 5.7% (120 of 2085) severe level of anxiety.[9,12,16]

Moreover, the range of mild anxiety was between 35.5% to 68.25%, moderate 17.7% to 20.8%, and severe 2.9% to 8.3%.[10,12,16] Besides, 63% (1383 of 2195) nurses reported severe anxiety as compared to doctors.[15,24,26] Even more, the associated factor of the anxiety was reported due to positive testing of colleagues, feeling of avoided by others, change in quality of work, worrying about family caring more in nurses as compared to doctors.[19]

Depression

In term of depression, it was identified among 28% (2681 of 9487) HCP.[4,10,11,15,17,18,21-26] with range of between 10.6% to 70.76%.[13,14] Furthermore, 33% (724 of 2195) nurses had severe level of depression.[15]

The review further revealed that, HCP who were working in ICU had moderate to severe depressive symptoms compare to HCP working in other than ICU.[17] Moreover, the frontline HCP had 1.5 times more risk of developing symptoms of anxiety, stress and poor sleep quality as compared to non-frontline HCP.[22,25,26] Whereas, Inadequate training of HCP was associated with high proportion of anxiety and depression.[13]

Post-traumatic Stress Disorder

In concern to PTSD, 41% (2933 of 7167) HCP had a symptom of this psychological impact.[4,10,11,15,18,25,26] Moreover, the PTSD symptoms were present between 7.6% to 56% HCP.[4,10,15] Even more, a study finding reported that, 97.9% (845 of 863) HCP identified with one or more symptoms of PTSD.[4] and the severity of PTSD was moderate to severe reported among 50.67% (34 of 67) HCP.[10] Furthermore, 65% (1427 of 2195) nurses had severe PSTD symptoms.[15,26] Moreover, the nurses had two times more risk of developing symptoms of PSTD and depression with respect to doctors.[15]

Stress

In this systematic review, stress was identified amongst 13% (487 of 3496) HCP [4,10,11,12,22] with varies range between 5.2% to 41.3%.[13,14] Furthermore, a greater number of nurses reported work related stress.[15] Besides, HCP who worked closely to COVID-19 patients showed high level of stress as compared to those, who were not in close contact.[16]

Sleep Problems

The sleep disturbance or insomnia was diagnosed amongst 26% (903 of 3442) HCP with varies range from 7.7% to 76.4%.[17,21,23-26] Moreover, the female HCP especially nurses had deteriorated sleep quality and most of 53.6% (111 of 208, $P=0.003$) affected with insomnia.[17,19-21,24,26] Furthermore, a study compared the quality of sleep among HCP, this study revealed that, HCP, who had direct contact with patients reported poor quality of sleep compared to other group mean (SD).[17] Besides, 30.3% (39 of 128) HCP deprived their sleep due to over worry about COVID-19.[21] Moreover, based on severity of insomnia, a study reported

Table 1. Characteristics of included studies

Author (year)	Country	Design	Participants	Scales
Kang et al[9] (2020)	China, Wuhan	Cross-sectional	n = 994 (Doctors & nurses)	• PHQ-9 • GAD-7 • ISI-7 • IES-R-22
Chew et al[10] (2020)	India and Singapore	Cross-sectional	n = 906 (Doctors, allied healthcare workers, administrators, clerical staff, nurses and maintenance workers)	• DASS-21 • IES-R
Tan et al[11] (2020)	Singapore	Descriptive	n = 470 (Physicians, nurses, allied health care professional, technician, clerical staff, maintenance workers)	• DASS-21 • IES-R
Si et al[4] (2020)	China	Cross-sectional	n = 863 (Clinical and administrative staff)	• IES-6 • DASS-21
Temsah et al[12] (2020)	Saudi Arabia	Descriptive	n = 582 (Senior physician, register physician, resident physician, intern, nurse & midwife, auxiliary staff)	• GAD-7
Qasem Surrati et al[13] (2020)	Saudi Arabia	Cross-sectional	n = 118 (Physician, surgeon, pharmacist, pathologist, nurse, dietician and technician)	• HAD • PSS
Conti et al[14] (2020)	Italy	Exploratory	n = 933 (Physician, nurses, technician from radiology or laboratory medicine, assistive personnel and hospital staff)	• PHQ-9 • GAD-7 • IES-R
Lasalvia et al[15] (2020)	Italy	Longitudinal	n = 2195 (Physicians, residents, nurses, health care staff, administrative staff)	• IES-R • SAS • PHQ-9
Badahdah et al[16] (2020)	Oman	Cross-sectional	n = 509 (Nurses and physicians)	• GAD-7 • PSS-10 • WHO-5
Saracoglu et al[17] (2020)	Turkey, Istanbul	Cross-sectional	n = 208 (Anaesthesiologists, nurses, nurse anaesthetists and staff)	• PHQ-9 • PSQI • Fear COVID-19 scale
Ali et al[18] (2020)	South East Ireland	Observational cohort	n = 472 (Hospital A and B) (Doctors, nurses, pharmacy, administrative staff, health care assistant, allied health care, audiologist, radiographer)	• DASS-21 • IES-R
Khanam et al[19] (2020)	India, Kashmir	Exploratory	n = 133 (Doctors, nurses, technician and others)	• Self-reported stress questionnaire • IES-R
Bhattacharya et al[20] (2021)	India	Exploratory	n = 154 (Psychiatrists, clinical psychologistic, psychiatric social workers, psychiatrics nurses)	• Anxiety scale • DASS-21
Kesavelu et al[21] (2021)	India, Chennai	Descriptive	n = 128 (Doctors, nurses, pharmacist, human resources, hospital staff)	• GHQ-12
Alshekaili et al[22] (2020)	Oman	Cross-sectional	n = 1139 (Physician, nurses, allied health professionals)	• DASS-21 • ISI
Barua et al[23] (2020)	Bangladesh	Cross-sectional	n = 370 (Physicians)	• PHQ-4 • GAD-2 • SCI-2 • FCV
Khanal et al[24] (2020)	Nepal	Cross-sectional	n = 475 (Doctors, nurses and others health personnel)	• HADS-14 • ISI
Sahin et al[25] (2020)	Turkey	Descriptive	n = 931(Physician, nurses and others)	• PHQ-9 • GAD-7 • ISI • IES-R
Cai et al[26] (2020)	China, Wuhan	Descriptive	n = 1330 (Nurses)	• PHQ-9 • GAD-7 • ISI • IES-R

PHQ: Physical health questionnaire, GAD: Generalized anxiety disorder, ISA: Insomnia Severity Index, IES-R: Impact of event scale -Revised, DASS-21: Depression anxiety stress scale-21, HAD: Hospital anxiety Depression questionnaire, PSS: Perceived stress scale, SAS: Self rating anxiety scale, WHO-5: World Health organization wellbeing scale-5, PSQI: Pittsburgh sleep quality Index, GHQ-12: General Health Questionnaire-12, SCI: Sleep Condition Indicator, FCV: Fear of coronavirus scale, HADS: Hospital anxiety depression scale.

Table 2. Risk of Bias and quality assessment summary of included studies

Author (year)	Clearly defined criteria for inclusion in the sample	The subjects of study and setting explain in detail	The valid and reliable way to measured exposer	Criteria and objective, standard used for condition measurement	Identified confounding factors	Confounding factors dealing strategies stated	The valid and reliable way to outcomes measured	Used appropriate statistical analysis	JBI score	Bias Risk
Kang et al[9] (2020)	+	+	+	-	-	-	+	+	5	Minor
Chew et al[10] (2020)	+	+	+	+	-	-	+	+	6	Low
Tan et al[11] (2020)	-	+	+	+	-	-	+	+	5	Minor
Si et al[4] (2020)	-	+	+	+	-	-	+	+	5	Minor
Temsah et al[12] (2020)	+	+	+	-	-	-	+	+	5	Minor
Qasem Surrati et al[13] (2020)	+	+	+	+	-	-	+	+	6	Low
Conti et al[14] (2020)	-	-	+	+	-	-	+	+	4	High
Lasalvia et al[15] (2020)	Assessed with JBI appraisal checklist for longitudinal study, found low risk for bias.									
Badahdah et al[16] (2020)	-	-	+	+	-	-	+	+	4	High
Saracoglu et al[17] (2020)	-	+	-	+	-	-	+	+	4	High
Ali et al[18] (2020)	Assessed with JBI appraisal checklist for cohort study, found low risk for bias.									
Khanam et al[19] (2020)	-	-	-	+	-	-	-	+	2	High
Bhattacharya et al[20] (2021)	+	+	+	+	-	+	-	+	6	Low
Kesavelu et al[21] (2021)	-	-	+	+	-	-	+	+	4	High
Alshekaili et al[22] (2020)	+	+	+	+	-	-	+	+	6	Low
Barua et al[23] (2020)	-	-	-	+	-	-	+	+	3	High
Khanal et al[24] (2020)	-	-	+	+	-	-	+	+	4	High
Sahin et al[25] (2020)	+	+	+	+	-	-	+	+	6	Low
Cai et al[26] (2020)	+	+	+	+	-	-	+	+	6	Low

that, 26.7% (43 of 141) HCP had sub threshold, 5.7% (8 of 141) had moderate and 1.5% (2 of 141) had severe insomnia.[24]

Other Psychological Impacts

In term of COVID-19 fear, 67.3% (392 of 582) HCP perceived as a public fear and threat, the most common threat was "fear of infection" and "doing high risk job".[4,5,15]

Furthermore, a study compared the health care workers with or without physical symptoms in which, those who had physical symptoms were screened positive for depression, anxiety, stress, and PTSD.[10]

Moreover, the nurses, who had co-morbidities or psychological problems, confirmed cases of their family members, relatives and friends developed PTSD, anxiety, depression and stress symptoms.[15,18,24,25] Nurses had more anxiety symptoms compare to doctors, as well as had high proportion of depression, severe insomnia symptoms compare to other profession.[24,26]

Moreover, young HCP (<40 year) and who lost their patients were reported higher level of depression, anxiety, and PTSD symptoms like intrusive thought, hyperarousal and avoidance by others.[14] whereas, only one study reported that younger HCP showed less symptoms of depression compare to old HCP.[24]

In term of gender, female HCP experienced high level of anxiety, depression, stress and somatization symptoms as compare to males[9,20,24,25] whereas a study also showed high psychological impacts among males ($P<0.03$).[19]

Two study findings, reported that there was a positive significant association between anxiety and depression, between anxiety and Perceived Stress Scale (PSS) and between PSS and depression.[13,20] The HCP with severe mental disturbance expressed an urgent need to seek psychological care services directly from professionals.[9]

Discussion

COVID -19, was an emergency situation with unique challenges to all HCP. It disturbed their physical and mental dimension, as well as, it hampered their daily life style on routine duties. In health care setting, being infected and fear of uncertainty in life had put major impact on their mental health.[2] Similarly, providing care to infected patient during COVID-19 situation generated high level of stress and fear and most of HCP were highly distressed due to fear of infection to family members by themselves.[13]

The major finding from this review that, most of HCP faced anxiety, depression, stress and sleep pattern disturbance and insomnia symptoms under psychological aspect of mental health. The similar trends observed in Singapore, in which, out of 1257 health care workers identified symptoms of depression 50.4% (634), anxiety 44.6% (560), insomnia 34% (427) and stress 71.5% (899)[27] and fear was among 41.6% (175 of 421).[28] Similarly in this review also, over all 33% (3081 of 9269) HCP had anxiety,

28% (2681 of 9487) had depression, 41% (2933 of 7167) had PTSD, 13% (487 of 3496) had stress and 26% (903 of 3442) had insomnia.

Associated Factors of Psychological Impact among Nurses

Most of studies in review revealed that, one third of nurses had symptomatic depression, anxiety, and insomnia, while over one-fifth of nurses had presented PTSD symptoms. Moreover, the associated factors behind this such as, switch in work pattern for nurses in covid crisis, change of physical condition, and uncertainty of fighting against the pandemic.[25] Whereas, As compared with physician, nurses were just doubled increased the risk of developing symptoms of post-traumatic distress and anxiety.[15]

Furthermore, associated factors of PTSD were chronic disease to self, had confirmed cases among their relatives and friends.[12] Even more, intensive care nurses and psychiatric nurses affected with highest deterioration in sleep quality as well as moderate-to-severe depressive symptoms as compare other HCP.[15,18,21]

Consequently, stigma experience among nurses, history of medication for mental health problems, inadequate precautionary measure in the workplace significantly associated with higher odd symptoms of anxiety, depression and insomnia.[23]

COVID-19 Fear among HCP

The most fear among HCP were fear of infection to self and family members due to demanding work conditions, fear of uncertainty in life and dealing with the death and dying.[15] Even more HCP justify that, there was public fear for inappropriate current situation of covid in different areas of community as well as social stigma of COVID-19.[4]

Moreover, associated fear of being avoided by others, the burden of change in the quality of work, worrying whether the family will be cared for in their absence or not.[19] A similar trends observed in Singapore and Spain studies that reported, fear due to inappropriate measure, heavy workload, fear of infection to self and family members.[29,30]

Gender Associated Psychological Impact

The review studies also showed that female gender more sensitize to this covid situation. With respect to anxiety, female, who had pre-existing psychological problems and perceived fear of getting infected experienced more traumatic related to COVID-19.[15] Furthermore, female gender with history of psychiatric illness emerged as risk factors for mental distress.[25] With this same trend, a study was conducted at Spain in which also showed that female HCP have more risk of developing symptoms of anxiety, depression and stress.[29,31]

Other Associated Factors of Psychological Impact

Other associated factors for psychological impact, such as younger generation (less than 40 years), reported a high level of stress, whereas, older HCPs experienced more positive well-being[14]. The psychological impact was highly significant in comorbid HCPs, Married HCPs, as well as who all posted in highly infected red zone and highly designated post.[18,19]

The most of studies used standardized scales to identify psychological impacts among HCP. The outcome of this review focused on distinct psychological impacts and various associated factors affecting frontline HCP. Majority of studies used online mode for data collection and most of the studies were cross sectional. There was a lack of prospective studies. Different version of scales was used to assess the psychological outcome. Geographical factors may influence due to social and cultural factors among the study location.

Conclusion

The most common symptoms of anxiety, depression, PTSD, insomnia and fear were present among majority of HCP, nurses and female HCP had double risk for developing these symptoms. This outcome is to provide some utilitarian information for making supportive policies and strategies to improve the psychological wellbeing of frontline HCP and nurses during this pandemic. Thus, there was immediate need of response strategies as like behaviour counselling, training, emergency communication, protective environment, interaction with family members and job satisfaction. It can build a greater reliance diverted to positive dimension and reinforce them to work hard in this pandemic crisis of COVID-19.

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Authors' Contributions

MKB, RVA: Conception and design; RDA: Data extraction, analysis and interpretation; AJ, RVA: Drafting of the article; MKB, RDA: Critical revision of the article for important content; MKB, RDA, RVA, AJ: Final approval of article.

Conflict of Interests

The authors declare no conflict of interest in this study.

Research Highlights

What is the current knowledge?

Current research findings revealed that HCP were more prone to developing advance psychological distress due to COVID-19 pandemic. But there was lack of evidence about gravity of psychological impact.

What is new here?

This systematic review generates strong evidence that, majority of HCP were developed symptoms of anxiety, depression, PTSD, insomnia, stress and fear. Nurses were more susceptible to develop these symptoms. Even more, there was an intense urge for coping strategies and skilled intervention for nurses and female HCP.

Data Accessibility
The datasets are available from the corresponding author on reasonable request.

Ethical Issues
None to be declared.

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