RESEARCH ARTICLE   **OPEN ACCESS**

PSYCHOLOGICAL IMPACT OF COVID-19 PANDEMIC ON HEALTH CARE WORKER IN SAUDI ARABIA: A SYSTEMATIC REVIEW

[1],*Hasna G. Al Zahrani and [2]Hoda Z Helmy

[1]Master student at King Abdulaziz University Jeddah
[2]Professor of Hospital Administration at King Abdulaziz University Jeddah

ARTICLE INFO

ABSTRACT

Background : Coronavirus disease 2019 (COVID-19) has caused mental health distortion in the among citizens across the globe. Healthcare workers have sustained frontline effort to curb the spread of the virus. However, few studies have investigated the impact COVID-19 on the psychological wellbeing in Saudi Arabia despite being among countries with high prevalence cases. The review aimed to determine the psychological impact of COVID-19 Pandemic on HCWs in Saudi Arabia. **Methods:** Systematic review was used for literature search in PubMed, Google Scholar, CINAHL, and Cochrane Library. Eligibility criteria was applied to screen and select 10 scholarly studies from the electronic databases. Centre for Evidence-Based Management (CEBMa) checklists were used to assess methodological quality of the studies while critical analysis of the ten studies facilitated data extraction. A narrative synthesis of different themes from the studies was presented. **Results:** Findings revealed cases of high psychological distress among healthcare workers in Saudi Arabia. The HCWs registered stress, depression, insomnia, fear, anxiety, and worries about personal or family health. Female physicians and nurses showed higher distress levels than their male healthcare professionals. **Conclusion:** COVID-19 has led to psychological distress among Saudi HCWs. Administrators and policymakers should improve organizational resilience, counselling, onsite therapy, and work-life balance. Further studies should establish longitudinal studies to determine the varied mental health outcomes of male versus female HCWs to understand gaps in mental health vulnerabilities due to COVID-19 pandemic.

Citation: Hasna G. Al Zahrani and Hoda Z Helmy. "Radicular cyst removal under general anesthesia: a case report", *2021. International Journal of Current Research, 13, (05), 17442-17449.*

INTRODUCTION

The coronavirus disease 2019 (COVID-19) Pandemic has exposed the healthcare systems to shortages that indicates overall low employment density. Continued studies on the coronaviruses have revealed that COVID-19 emanates from the SARS coronaviruses 2 (SAR-CoV-2), which have a zoonotic source. African region reported the highest shortage as 57 HCWs serve at least 10,000 people (Statistics, 2020). Comparatively, developed nations such as UK, US, Canada, Germany, France, Netherlands, Portugal, Belgium, Austria, and South Korea have achieved 174 employed HCWs per 10,000 people. Both developed and developing nations are facing overall shortage, which has hampered the battle against COVID-19 Pandemic.

At least more than 70% of the HCWs were female, which shows the disproportionate share of the frontline healthcare professionals dealing with diverse care demands in the healthcare sectors (Statistics, 2020). The shortage of HCWs has exposed them to COVID-19 infections. At least 90,000 HCWs had contracted COVID-19 in at least 30 countries by May 2020(2). The International Council of Nurses (ICN) estimated the infection rate of at least 6% out of the 3.5million confirmed COVID-19 cases by May 2020. Consequently, Saudi Arabia adopted the necessary precautions to safeguard the healthcare workers against COVID-19 including providing PPEs and counselling (Euronews, 2020). Additionally, HCWs are facing physical and mental fatigue as they dispense their duties in the healthcare systems facing increasing pressure from COVID-19. Healthcare workers (HCWs) face the increased risk of exposure to the novel COVID-19 as they execute their duties of continuous patient care. Countries have implemented different protocols in place to reduce the transmission of the virus (Chang *et al.,* 2020).

*****Corresponding author:** *Hasna G. Al Zahrani,*
Master student at King Abdulaziz University Jeddah.

Governments and hospitals have taken keen measures such as requiring HCWs to wear personal protective equipment (PPEs) such as N95 masks, goggles, and protective gowns to reduce transmission of COVID-19 at the bedside or within the healthcare institutions. The primary focus has been reduction of transmission and the infective potency of SARS-CoV-2 (Adams, 2020). Moreover, supporting the healthcare workers during the pandemic has been critical to flattening the curve while maintaining quality patient care. The high risk of infection among HCWs is due to the human-to-human transmission of the novel COVID-19. Supporting the frontline HCWs is imperative since they are critical players in preventing the overwhelming nature of the disease and aligning with the capacity of the existing healthcare systems (Adams, 2020). Symptomatic and asymptomatic individuals or patients increase the risk of infection to the HCWs who might lack proper PPEs during active management and vigilance of the disease. Consequently, there has been incessant need for training the HCWs to enhance protection and maintain capacity to manage COVID-19 infections within the healthcare sector. Furthermore, HCWs were likely to contract COVID-19 due by working in the high risky units (Ran, 2020). Longer duty hours than before the pandemic and gaps in the suboptimal hand hygiene predisposed the workers to the risks of contracting COVID-19. Healthcare personnel face diverse risks in the process of handling symptomatic or asymptomatic patients and operating in environments without proper standard protection procedures.

HCWs in Saudi Arabia have faced increase physical and mental fatigue (Hassan, 2020). Foreign and Saudi healthcare professionals have faced increasing uncertainties of dealing with a novel virus in the healthcare system. The experience of treating patients from viral respiratory illness of MERS. China prioritized the prevention of intra-hospital transmission of the viral respiratory disease to protect HCWs. Analysis of strategies and measures through Systems Engineering Initiative for Patient Safety model revealed increasing infection rates due occupational risks. Another systematic review of randomised control trials (RCT) by (Bartoszko, 2020) associated the stress levels with availability of PPEs. The selection of RCTs as opposed to other systematic reviews and other empirical studies limited the scope of evidence the review could extract for the four RCTs. Using four RCTs was not representative considering other systematic reviews (8)(9) used more articles for data synthesis as well as analysis. Consequently, the review used indirect and imprecise evidence from the four journal articles despite associating the availability of N95 masks and medial respirators to possible infections and psychological distress. Current studies lack overall specificity on the way COVID-19 leads to stress, anxiety, depression, and overall mental instability. The gaps inform the following research question:

What is the psychological impact of COVID-19 on healthcare workers in Saudi Arabia?

Specific Aims

⌡ To determine if COVID-19 leads to high rates of depression among healthcare workers in Saudi Arabia
⌡ To establish if COVID-19 has increased stress levels among healthcare workers in Saudi Arabia
⌡ To determine if COVID-19 had led to insomnia prevalence among healthcare workers in Saudi Arabia

METHODS

Research Design: The study incorporated systematic review to find the best evidence for answering the research questions. Using the research designs optimized the quality of evidence or studies gathered in the study. The research used systematic review as one of the main research designs to reconcile evidence on the psychological impact of COVID-19 on the HCWs in Saudi Arabia. The systematic review entailed the development of a focused and clinical research question as well as utilizing the relevant studies to answer it (Grove, 2012).

Formulating a Focused Research Question

The systematic review involved the formulation of the main research question. Reviewers or investigators should check other systematic reviews to avoid duplicating the clinical question (11). Therefore, the research question included all the variables of the study. PICO (Population, Intervention, Comparison, and Outcomes) framework helped to develop the research question and breaking it down into various terms or variables for the study. The evaluation of existing studies or systematic reviews helped to develop the following research question.

What is the psychological impact of COVID-19 pandemic on the healthcare workers in Saudi Arabia?

PICO mnemonic assisted in formulating and breaking down the research questionas follows:

⌡ **P (population)**– healthcare workers in Saudi Arabia
⌡ **I (Intervention)**– COVID-19 pandemic
⌡ **C (comparison)**– occupational diseases
⌡ **O (Outcome)**– psychological wellbeing of the frontline healthcare workers

Search Strategy: A search strategy was implemented to find the medical literature for answering the research question. The literature search utilized different medical and nursing databases. The database included Google Scholar, CINAHL, PubMed, and Cochrane Library. Keywords, from the PICO question, were used in the comprehensive search for an array of journal articles in the four electronic databases. The keywords used in the search process include, "healthcare workers," "Saudi Arabia," "COVID-19 pandemic," "occupational diseases," "psychological wellbeing," "psychological impact," "depression," "stress," "insomnia," and "frontline healthcare workers." The reviewer combined the keywords using Boolean Operators "AND" and "OR." Combining the keywords and the terms maximized the search results as they injected specificity into the search process in each database. Varying the keywords in each database was important because it enhanced the process and maximized the number of records generated for the review.

Eligibility Criteria: The eligibility criteria defined the selection of the records to be used in the systematic review. The reviewer included studies published in English language to enhance understanding of how the COVID-19 has affected the psychological wellbeing of the HCWs in KSA. The inclusion criteria further considered articles that targeted HCWs in Saudi Arabia to generate insights with specificity. Studies published in 2020 were included since they contained the latest insights on COVID-19 pandemic and its psychological effect on the frontline HCWs. The exclusion criteria defined the elimination of studies that did not meet the parameters set for the systematic review. Any study that was published before COVID-19 pandemic was excluded since it lacked the relevant insights on the disease and its psychological impact of healthcare workers. Excluding records published in other languages as opposed to English ensured that the systematic broaden the analysis and understanding of different perspectives. Studies published before 2020 lacked the relevant and current findings on COVID-19.

SEARCH RESULTS

The reviewers applied the inclusion and exclusion criteria to generate manageable journal articles for the systematic review. Google Scholar, Pub Med, CINAHL, and Cochrane Library produced different studies that required further filtering to influence a manageable systematic review. The four databases generated 603 records. Screening the studies for duplicates led to the removal of 103 records. Out of the 500 remaining studies, only 203 met the inclusion criteria of addressing the research question after examining their abstracts. A further screening process based on the inclusion and exclusion criteria helped to remove 193 studies for failing to address the research question.

A systematic review requires a few journal articles that present different perspectives on the phenomenon under study. Consequently, further examination of the full-text articles led 10 articles that met the eligibility criteria. Figure 1 presents the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram on how the studies were screened for inclusion in the final review.
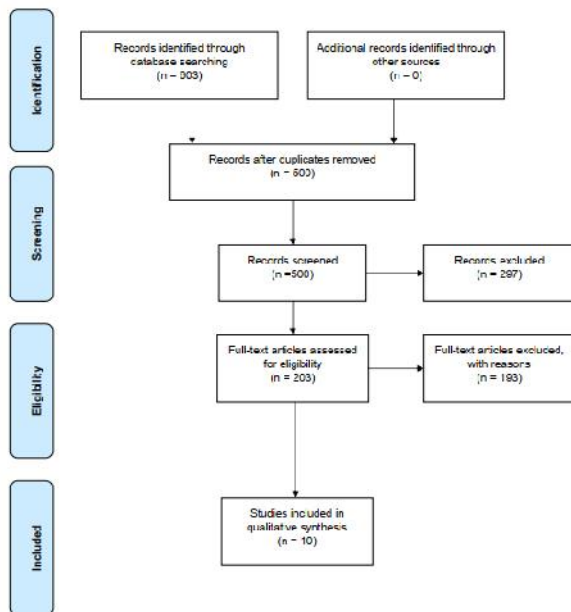

Figure 1. PRISMA Flow Chart

Quality Appraisal and Evaluation: Following the selection of the 10 studies for inclusion in the systematic review, the studies were considered for quality appraisal. Centre for Evidence-Based Management (CEBMa) checklists were used for evaluating the validity of the findings for the research. CEBMa specifies the questions for each research design to understand the methodological quality. Using CEBMa checklists enabled the investigator to concentrate on the quality of the evidence and relevance to the research question. primarily, the checklist dictated appraisal of the validity of each study, the results, and application of the results in a local or clinical context.

Data Synthesis: A thematic analysis was used to extract the themes from the 10 studies. Appendix 1 outlines the data extraction table where the study design, participants, sampling, country, setting, data analysis, findings, and ethics of each research were considered. Each theme responded to the research question after the assortment of the insights in each study. The synthesis led to the narrative reporting and presentation of findings.

RESULTS

Characteristics of Selected Literature: The search process produced 10 journal articles that informed the systematic review. Table 1 outlines the features of the 10 journal articles. identifying the features of each journal article enhanced the theoretical and empirical understanding, which then answer the main research question. The table contains details such as the authors' names, country, setting, sampling, methods, data collection, analysis, and the ethical considerations in the research. The table further offers a perspective on way each study answered the research question and met the research objectives outlined for the systematic review.

Methodological Quality: The 10 journal articles selected for the systematic review applied different methods. The quantitative methodologies used included a cross-sectional survey (Abouammoh, 2020), cross-sectional studies (Al Sulais *et al.,* 2020; AlAteeq *et al.,* 2020; Alenazi *et al.,* 2020; Al-Hanawi, 2020; Alshareef, 2020; Alzaid *et al.,* 2020; Temsah *et al.,* 2020; Zaki, 2020; El Keshky, 2020) used

different quantitative measures that included Emotion Regulation Scale (ERQ), Satisfaction with Life Scale (SWLS), Multidimensional Scale of Perceived Social Support (MSPSS), and the Hospital Anxiety and Depression Scale (HADS). Furthermore, Centre for Evidence-Based Management (CEBMa) helped to evaluate the appropriateness of the surveys and different cross-sectional methods applied by the researchers. The appraisal tool assisted in determining and confirming construct validity of each study as illustrated in Table 3. CEBMa checklists provided the 12 questions for assessing the methodological quality of the study by (Abouammoh *et al.,* 2020) as illustrated in Table 2. The authors addressed a clearly focused research question, considerations of sample size, response rate, measurements, and the assessment of the statistical significance.

Summary of Findings: (Abouammoh *et al.,* 2020) assessed the effect of the COVID-19 pandemic on the psychological health of the practicing ophthalmologists in Saudi Arabia. While the study included more female than male participants in a sample of 1007 participants, 50.6% of the physicians experienced depression symptoms. COVID-19 pandemic led to moderate stress levels and insomnia of 28% and 44.8%. Furthermore, the anxiety level was relatively high as 46.7% among the male and female ophthalmologists indicated a stressful effect of COVID-19. Overall, female subjects experienced more psychological distress than their male counterparts as they dispensed their duties on the frontline units.

(Al Sulais, 2020) studied the psychological effect of COVID-19 crisis on the Saudi physicians through a survey-based cross-sectional rather than an online survey. The study revealed mental health effects emanating from the quarantine, quarantine behaviours, socioeconomic, and psychological outlook. The 529 physicians in the study revealed their difficulties and stress as they battled COVID-19 in designated and non-designated areas in Saudi Arabia. The HCWs expressed worry, fear, isolation difficulties, and trauma as they dealt with patients and other psychological reactions from patients in Saudi Arabia. Another cross-sectional study by (AlAteeq *et al.,* 2020) that utilized a convenience sample of 502 HCWs rather than a random selection of participants. The study recognized the effort by the WHO in dealing with different psychiatric manifestations of COVID-19 of the frontline HCWs rather than dealing with the symptoms of the disease alone. The study included different HCWs rather concentrating on physicians or Ophthalmologists as (Al Sulais *et al.,* 2020) and (Abouammoh *et al.,* 2020) did, respectively. The HCWs included administrators, nurses, physicians, technicians, non-physician specialists, and pharmacists. Out of the 502 respondents, 55.2% experienced depressive disorder in mild, moderate, and moderately severe. (14)agreed with (13)on female HCWs registering higher psychological distress than their male counterparts did during the COVID-19 pandemic. Study by (15) explored the prevalence and predictors of degree of anxiety of HCWs in Saudi Arabia during the COVID-19. The 4920 HCWs experienced different anxiety levels guided by their sociodemographic statuses. Nurses, workers in radiology, and respiratory therapists experienced heightened anxiety levels. Elderly workers experienced more anxiety than the unmarried or married workers did. Social factors such as living with elderly persons, chronic diseases, immune deficiency, and respiratory diseases exacerbated the anxiety levels. On the other hand, Organization-related factors such as hosting COVID-19 patients and working with the patients at the bedside increased mental health distress guided by the 68.5% prevalence of anxiety levels.

Another author (16)carried out a cross-sectional study that sought insights from 3036 participants through online self-reported questionnaire. The study investigated the psychological distress of HCWs during COVID-19 pandemic. The authors constructed the psychological distress using the Peritraumatic Distress Index. Young Female HCWs who were working in the private sector experienced higher distress levels than the workers in the public sector. The psychological distress varied between the HCWs due to their sociodemographic characteristics and the existing policy gaps for maintaining mental wellbeing. Findings from another study by (Alshareef, 2020) focused on the psychosocial wellbeing rather than distress levels in general in the Western region of Saudi Arabia.

Table 1. Data Extraction Table

Author/ Characteristics	Location	Research Design	Setting	Sample size	Data Collection	Data Analysis	Results or Findings	Ethics Discussed
Abouammoh et al. (2020)	Saudi Arabia	Cross-sectional Survey	Online	Simple random sample of 126 Ophthalmologists	Self-administered online survey	IBM-SPSS version 21 for descriptive statistics, Chi-Square	Stress, anxiety, depression, and insomnia among Ophthalmologists	Ethical approval Informed consent
Al Sulais et al. (2020)	Saudi Arabia	Cross-sectional survey	Eastern regions	529 physicians	Survey questionnaires	STATA for standard t-test, chi-square,	Worry, isolation, fear, anxiety, and stress among physicians Female physicians registered more trauma than male physicians	Informed consent
AlAteeq et al. (2020)	Saudi Arabia	Cross-sectional survey	Ministry of Health	Convenience sample of 503 HCWs	Patient Health Questionnaire (PHQ-9) and Generalized Anxiety Disorder 7 (GAD-7) questionnaires	IBM-SPSS for descriptive statistics and non-parametric Mann–Whitney U tests or Kruskal–Wallis tests	High and mild depression as well as anxiety among HCWs	IRB Approval of Princess Nourah Bint Abdulrahman University (PNU) in Riyadh, Saudi Arabia Informed consent of participants
Alenazi et al. (2020)	Saudi Arabia	Cross-section study	13 administrative regions in Saudi Arabia	4920 HCWs	Email responses as per Saudi Commission for Health Specialties	IBM-SPSS version 25 for Chi-Square and ANOVA test	Self-reported and high levels of anxiety	IRB Approval Informed consent of the participants
Al-Hanawi et al. (2020)	Saudi Arabia	Cross-section study	Online	950 HCWs	Online self-reported questionnaires	STATA 15.1 for multivariate regression analysis	High, mild, and moderate psychological distress among female HCWs than in their male counterparts	Informed consent Ethical approval from Biomedical Ethics Research Committee, Faculty of Medicine, King Abdulaziz University
Alshareef et al. (2020)	Saudi Arabia	Cross-section study	Western regions hospitals	121 medical and surgical residents	Survey questionnaire	IBM-SPSS version 26 for descriptive statistics and Chi-Square	Psychological distress among junior and female than among senior residents	Informed consent Ethical approval
Alzaid et al. (2020)	Saudi Arabia	Cross-section study	Eastern province	441 HCWs	Self-administered questionnaires	IBM-SPSS version 21 for Cronbach's alpha, Descriptive Statistics, Chi-square, and Multivariate regression analysis	Anxiety disorder that varied with family history, nationality, gender, and chronic conditions	Approval from E1-First Health cluster Informed consent
El Keshky et al. (2020)	Saudi Arabia	Cross-section study	Quarantine center	200 HCWs	Emotion Regulation Scale (ERQ), Satisfaction with Life Scale (SWLS), Multidimensional Scale of Perceived Social Support (MSPSS), and the Hospital Anxiety and Depression Scale (HADS)	IBM-SPSS version 20 for multivariate regression analysis	Overall anxiety, depressive, and stress symptoms in at 40% of the respondents More anxious and stressed female HCWs	Informed consent Ethical approval Privacy and confidentiality
Temsah et al. (2020)	Saudi Arabia	Cross-section study	Tertiary care teaching hospital in Riyadh	811 HCWs	Self-reported questionnaire and Generalized Anxiety Disorder (GAD-7) Anxiety Severity screening tool	IBM-SPSS Version 20 for Fisher's exact tests and summary analysis	High stress, anxiety, and worries about infections for families or transmitting the virus to others	Ethical approval of King Khalid University Hospital (KKUH), Riyadh Informed consent Confidentiality
Zaki et al. (2020)	Saudi Arabia	Cross-section study	Northern Area Armed Forces Hospital-Kingdom of Saudi Arabia	Convenience sample of 249 participants	Survey questionnaires	IBM-SPSS version 25 for descriptive statistics and correlation analysis	High levels of depressive symptoms, anxiety, and post-traumatic episodes	Ethical approval and Northern Area Armed Forces Hospital-Kingdom of Saudi Arabia Informed consent Voluntary participation

Table 1: CEBMa Checklist for a Survey

Appraisal Questions/Studies	Abouammoh et al. (2020)
1.Did the study address a clearly focused question / issue?	Yes
2.Is the research method (study design) appropriate for answering the research question?	Yes
3.Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes
4.Could the way the sample was obtained introduce (selection)bias?	No
5.Was the sample of subjects' representative with regard to the population to which the findings will be referred?	Yes
6.Was the sample size based on pre-study considerations of statistical power?	Yes
7.Was a satisfactory response rate achieved?	Yes
8.Are the measurements (questionnaires) likely to be valid and reliable?	Yes
9.Was the statistical significance assessed?	Yes
10.Are confidence intervals given for the main results?	Yes
11.Could there be confounding factors that haven't been accounted for?	No
12.Can the results be applied to your organization?	No

Table 2: CEBMa Checklist of Cross-Sectional Studies

Reviewer's Appraisal Questions/Authors	Al Sulais et al. (2020)	AlAteeq et al. (2020)	Alenazi et al. (2020)	Al-Hanawi et al. (2020)	Alshareef et al. (2020)	Alzaid et al. (2020)	El Keshky et al. (2020)	Temsah et al. (2020)	Zaki et al. (2020)
1.*Did the study address a clearly focused question / issue?*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2.*Is the research method (study design) appropriate for answering the research question?*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3.*Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4.*Could the way the sample was obtained introduce (selection)bias?*	No	No	No	No	No	No	No	No	No
5.*Was the sample of subjects representative with regard to the population to which the findings will be referred?*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6.*Was the sample size based on pre-study considerations of statistical power?*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7.*Was a satisfactory response rate achieved?*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8.*Are the measurements (questionnaires) likely to be valid and reliable?*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9.*Was the statistical significance assessed?*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10.*Are confidence intervals given for the main results?*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11.*Could there be confounding factors that haven't been accounted for?*	No	No	No	No	No	No	No	No	No
12.*Can the results be applied to your organization?*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The study established the effects of the pandemic on the medical training process besides the practicing resident doctors registering increased changes in attitudes as well as their daily habits. While a sample of 121 residents was small and non-representative when compared to what (Alenazi, 2020) recruited, the study established overall negative effects of COVID-19 pandemic. Female and junior residents registered more psychological distortion than their older counterparts in the Western Saudi Arabia. The professional level and unit affected the psychological wellbeing as they treated patients in the frontline. Outcomes from another cross-sectional study by (18)confirmed the role of COVID-19-related anxiety among the HCWs in Saudi Arabia. The findings aligned with the perspectives of (15)and (13)on how HCWs registered high anxiety levels. The outcomes varied with the sociodemographic characteristics of the nurses, physicians, and administrators. Gender, nationality, living with family, nationality, and family history of COVID-19 increased anxiety disorder levels. Another argument by (18)emphasised that anxiety disorder among HCWs was more rampant among female HCWs following confirmation of COVID-19 at individual levels of among patients. According to (Temsah, 2020), COVID-19 led to the unprecedented psychological distress on 811 HCWs where Middle East respiratory syndrome coronavirus (MERS-CoV) had ravaged. The HCWs from the tertiary care teaching hospital registered a higher anxiety levels after COVID-19 than in the MERS-CoV pandemic.

The anxiety and stress of the HCWs emanated from the fears and confusion on how to deal with the psychological impact. The cross-sectional study emphasized the need for increasing infection prevention and enhancing compliance HCWs during the COVID-19 than in the MERS-CoV outbreak. The COVID-19 increased fears and anxiety due to its novel status due to lack of defined treatment or safety measures within the healthcare settings. Another cross-sectional study by (Zaki, 2020) studied the stress and other psychological consequences of healthcare workers in Saudi Arabia as part of assessing the mental health changes during the COVID-19 pandemic. The study focused and recruited a relatively young staff with a mean age of 38.6years. Different psychological outcomes emerged from the cross-sectional study of HCWs of Northern Area Armed Forces Hospital in Saudi Arabia. The staff experienced anxiety, depressive disorders, crying, depressive mood, and loss of motivation. Furthermore, financial distress exacerbated the psychological impact of COVID-19 on the HCWs working at the military hospital in Saudi Arabia. The analysis of (El Keshky, 2020) focused on both psychological and social impacts on the personal stress of the residents in Saudi Arabia. The 200 residents lived in quarantine registered a high prevalence of depressive symptoms, stress, and anxiety. However, the psychological distress emanated from the low social support, life satisfaction, and cognitive reappraisal. The findings revealed how young residents suffered from the anxiety and stress levels due to the mental distortion created by the pandemic. Both (21)and (20)agreed on mental health issues prevailing during COVID-19 pandemic than in any other period.

DISCUSSION

Increased Anxiety: The pandemic had led to high anxiety levels among the HCWs in Saudi Arabia. According to (15)the sociodemographic status of the HCWs in Saudi Arabia underlined their exposure to anxiety. Different issues drove the distress including living with elderly persons, chronic diseases, questions about immune deficiency, and respiratory illnesses. Past study by (22)recognised that the hopelessness of dealing with the hectic schedule and commitment led to high anxiety levels in Turkish hospitals. HCWs in Saudi Arabia endured similar circumstances at the frontline and as patients. However, the anxiety levels were higher in nurses than among doctors despite the existence of psychosocial interventions for different high-risk groups of HCWs.

Depression: Studies agree on the prevalence of case of depression among HCWs in Saudi Arabia. Depression was among the mental health issues facing HCWs in Saudi Arabia alongside insomnia and anxiety (Abouammoh *et al.*, 2020). However, the prevalence occurred among ophthalmologists rather than all HCWs dealing with different cases COVID-19 at the frontline. Different incidences surrounding COVID-19 have led to depression cases among HCWs in Saudi Arabia guided by findings from other studies. The findings align with the observations of (Zheng, 2021) when they conducted a cross-sectional study in China. The mental health of the nurses was at stake following the novel outbreak, which the World Health Organisation lacked a definite framework for curbing or implementing care at the bedside. Depression is a compelling psychological outcome among HCWs handling COVID-19. **Stress:** The stress increase when the HCWs contract the virus while treating patients in isolation units. Another study (Al Sulais *et al.*, 2020) associated the increased stress levels with the worry, fear, and anxieties created by the pandemic in the healthcare settings. According to (Elbay *et al.*, 2020) the stress levels vary according to the working conditions and sociodemographic status of the HCWs. depression and stress scale vary with the effort made towards dealing with the symptoms as the nurses and physicians develop mechanisms of managing the virus. Studies by (Alenazi *et al.*, 2020) and (Al-Hanawi, 2020) insisted that HCWs in Saudi Arabia register elevated distress levels due to other factors as opposed to the dealing with the COVID-19 patients. Living with older persons, socioeconomic status, and chronic conditions exacerbate the stress levels as the physicians or nurses maintain their resolve to treat COVID-19 patients. However, (Galbraith, 2020) argue that the limited leadership and support from the management or families as well as unclear protocols for handling COVID-19 has exacerbated the problem. Additionally, different fears define the psychological health HCWs.

Fears: HCWs in Saudi Arabia developed fears besides series of depression and anxiety due to COVID-19. Study by (Temsah, 2020) assessed the unprecedented psychological distress besides the mental health distortion from the normal work situations. Fears emanated from the confusion created by the exceptional care required for the COVID-19 patients and exposure to the virus at a time when PPEs were scarce and insufficient in Saudi Arabia. According to (26), fears have underlined the mental health of the HCWs in developed and developing nations in the COVID-19 pandemic due to varied factors. Physicians and nurses in advanced practice, residents and trainees consider unclear coping behaviours and strategies and access to the therapists during the COVID-19 period. Saudi Arabia HCWs endured periods of unclear provision for counselling despite facing a novel virus and potential infections for their families, and them. Doctors and nurses develop fears of contracting the virus as the knowledge about COVID-19 continues to develop and appear.

Insomnia; The review revealed cases of insomnia among the HCWs in Saudi Arabia. the sleep difficulties were more rampant among the healthcare workers than among administrative staff in Saudi Arabia due to the COVID-19 contact and measures. The findings align with the outcomes of a survey of (27)on insomnia and other mental health issues facing HCWs during the 2019 Novel COVID-19 outbreak. The prevalence of insomnia confirmed the rampant sociopsychological distortion, long working hours, fears, and anxiety among the medical staff during COVID-19 pandemic. The sociopsychological status of the HCWs in Saudi Arabia was dire in the middle the COVID-19 pandemic as (12), (14), and (21) found compelling cases of sleeping difficulties.

Mental Health of HCWs: The mental health difficulties emanate from the isolation, worry, and overall fears of handling the disease. The psychological reactions of the HCWs were more rampant in nurses than the doctors with more flexible working schedules. Studies by (20), (16), and (17) established that the psychological outcomes of the HCWs in Saudi Arabia will prompt proper psychological support from the government and relevant health bodies. A past study (28) suggested safety, physiologic, and sense of belonging-related care besides providing the workers with protective gears. The findings from Saudi Arabia confirm the existing gaps in the global healthcare systems where the complex psychological needs of the HCWs do not take precedence.

Females versus Male HCWs: Gender is a predictor of the psychological impact of COVID-19 on HCWs in Saudi Arabia. Female are more likely to develop anxiety, stress, depression, fears, and insomnia due to the disrupted work schedule. The assertion was evident from a past study (29) as it established from the vulnerable healthcare professionals in Oman that female nurses and physicians lacked the psychological resilience to deal with the destructive and disruptive effects of COVID-19. The distress among females explains the high likelihood hospitals developed work and sociopsychology measures to enhance their contribution to the containment of the virus. The hospitals should have developed flexible schedules for female health professionals to overcome the psychological burden. Other authors (14) and (13) argue that the female HCWs register mild, moderate, and moderately severe cases due to the pressure created by COVID-19. Sociodemographic variables are integral part of the COVID-19 discourse on its psychological impact on distinct groups of HCWs. The married status of the female physicians, nurses, or administrative staff is more likely to influence their mental health statuses during health pandemic than their training level (Alenazi *et al.*, 2020). Factors such as living with elderly persons, immune deficiency, respiratory diseases, and chronic diseases threaten the psychological wellbeing of the workers further. A past study (Brubaker, 2020) found that that women physicians struggled with moral crisis and professional fulfilment gaps before and during COVID-19 pandemic. The female HCWs face persistent work-life imbalance, 24/7 availability, and limited priority to their personal roles.

Quality of Life of HCWs Due to COVID-19: The psychological distress on the HCWs indicates the diverse perspectives on the quality of life during the COVID-19 pandemic. Findings indicate a patient-centred care as opposed to balancing the expectations and needs of the HCWs charged with implementing the complex care protocols to curb the novel coronavirus. Saudi Arabia's HCWs recorded low quality of life during the COVID-19 indicates low professional quality of life. The mental health outcomes of the nurses, physicians, and the administrative staff showed the need for balancing the needs of the professionals at the frontline of reducing the impact of COVID-19. Studies (16)(20)(21)(31)insist that hospitals lack pandemic specific measures of dealing with burnout, anxiety, and depression. Saudi Arabia is among healthcare systems that struggled with overcoming the shortage of frontline staff and assistants to prevent the adverse mental health. Consequently, offering work-life balance was impossible as the rising cases and resurgence of COVID-19 meant 24/7 availability for HCWs. The Saudi Arabia context of mental health distress indicates gaps in the attainment of organizational resilience.

Conclusion

The systematic review looked to determine the psychological effect on HCWs in Saudi Arabia. The critical analysis and comparison of findings from the ten studies revealed different that HCWs in Saudi Arabia endured incidences of stress, anxiety, insomnia, depression, fears, and worries about the COVID-19 pandemic. The professionals suffered psychological distress in their capacities as HCWs and infected patients in the isolation centres. The systematic review further revealed distinct reasons behind the challenge mental health vulnerabilities among the healthcare professionals in Saudi Arabia. The review aimed to determine if COVID-19 lead to increased rates of depression among HCWs in Saudi Arabia. The analysis revealed high depression rates among the nurses, physicians, and administrative staff with distinct roles in curbing COVID-19 Saudi hospitals.

The study noted the increased shift hours, novel coronavirus, and pressure from patient complications as drivers of depression rates. Some HCWs feared developing further complications due to age, gender, and overall susceptibility to demise due to pre-existing comorbidities. The systematic review looked to establish whether COVID-19 increased stress levels among the HCWs in Saudi Arabia. The findings indicate increased cases of stress levels across all

medical and nursing discipline at the frontline in reducing cases of COVID-19 in Saudi Arabia. However, female HCWs showed more mental health susceptibility than their male counterparts due to the threat of infections and junior statuses. Some nurses expressed stressing environment of dealing with patients for longer hours than the physicians amidst a shortage of PPEs and HCWs to deal with the excessive demand for quality patient care. The risk of infection damaged the mental health stability of the HCWs in different units in Saudi hospitals. The study further focused on determining if COVID-19 pandemic led to insomnia prevalence among the HCWs in Saudi Arabia. Cases of insomnia affected the HCWs with recurring stress, depression, and anxiety. However, the sleep difficulties were more rampant among nurses and female HCWs due to lack of gender-specific approach, limited work-life balance, and prolonged schedules. The healthcare professionals have faced pressure in the active care settings under normal work circumstances. COVID-19 pandemic elevated the exposure to imbalance between work and personal or family lives. On the other hand, some HCWs expressed fears over their families with chronic conditions, elderly, and economic status during the pandemic.

Limitations: While the CEBMa checklist helped to appraise the articles and confirm their high methodological quality, the findings were prone to exaggeration and negative results. The gaps might have affected the overall quality and reliability of the findings in answering the research question with certainty. The literature search process was resource and time intensive due to the current nature of the COVID-19 phenomenon.

Implications for the Health Profession: Nursing administrators should prioritize the psychological care of the frontline HCWs as they demand commitment of their skills and experiences to curbing COVID-19. The psychological care should include ongoing therapy to address stress, anxiety, and depression symptoms due to fears of infections. Accompanying counselling experts in the isolation centres is essential since the HCWs in Saudi Arabia require timely support. The resurgence of COVID-19 further demands gender-specific therapy to eliminate the high cases of depression, stress, anxiety, and fears among female HCWs. There should be flexible working schedule now that hospitals have established predictable patterns of infections and morbidities. The strategy will translate into QoS and reduce mental health vulnerabilities in general. Administrators should increase the organizational resilience framework to deal with COVID-19 pandemic. Saudi Arabia context of COVID-19 and the registered psychological distress represents the compelling demands for effective measures for the healthcare professionals. The workers will require measures that will enhance their understanding of COVID-19, provision of PPEs, and economic fears. The findings indicate the need for addressing concerns of living with elderly persons, increasing immunity, and reducing infection rates. Self-care, organizational justice, and manageable workload will enhance resilience during COVID-19 pandemic.

Direction for Future Research: Scholars should conduct longitudinal studies to determine the varied mental health outcomes of male versus female HCWs. The studies will explore the underlying reasons for female mental health issues versus their male counterparts over a longer period than the ten studies assessed.

ABBREVIATIONS
CEBMa - Centre for Evidence-Based Management
COVID-19– Coronavirus Disease 2019
HCWs– Healthcare workers
KSA– Kingdom of Saudi Arabia
MERS-CoV- Middle East respiratory syndrome–related coronavirus
MOH– Ministry of Health
OHS- Occupational Health and Safety
PPEs– Personal Protective Equipment
PRISMA- Preferred Reporting Items for Systematic Reviews and Meta-Analyses
SARS-CoV-2 - Severe acute respiratory syndrome coronavirus 2
UN-SDGs- United Nations' Sustainable Development Goals (SDGs)

REFERENCES

Statistics ILO. COVID-19: Are there enough health workers? [Internet]. ILOSTAT. 2020. Available from: https://ilostat.ilo.org/covid-19-are-there-enough-health-workers/

Euronews. COVID-19: 90,000 healthcare workers infected, says nursing group [Internet]. Euronews. 2020. Available from: https://www.euronews.com/2020/05/06/at-least-90-000-healthcare-workers-infected-by-covid-19-says-nursing-group

Hassan R. Expat health workers join Saudi colleagues in brave fight to defeat COVID-19 [Internet]. Arab News. 2020. Available from: https://www.arabnews.com/node/1687416/saudi-arabia

Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med [Internet]. 2020;8(3):e13. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7128440/

Adams JG, Walls RM. Supporting the Health Care Workforce During the COVID-19 Global Epidemic. JAMA. 2020;323(15):1439.

Ran L, Chen X, Wang Y, Wu W, Zhang L, Tan X. Risk Factors of Healthcare Workers with Corona Virus Disease 2019: A Retrospective Cohort Study in a Designated Hospital of Wuhan in China. Clin Infect Dis. 2020;71(16):2218–21.

Bartoszko JJ, Farooqi MAM, Alhazzani W, Loeb M. Medical Masks vs N95 Respirators for Preventing COVID-19 in Health Care Workers A Systematic Review and Meta-Analysis of Randomized Trials. Influenza Other Respi Viruses. 2020;14(4):365–73.

Salazar de Pablo G, Vaquerizo-Serrano J, Catalan A, Arango C, Moreno C, Ferre F, et al. Impact of coronavirus syndromes on physical and mental health of health care workers: Systematic review and meta-analysis. J Affect Disord. 2020;275:48–57.

Kisely S, Warren N, McMahon L, Dalais C, Henry I, Siskind D. Occurrence, prevention, and management of the psychological effects of emerging virus outbreaks on healthcare workers: rapid review and meta-analysis. BMJ. 2020;369:m1642.

Grove SK, Burns N, Gray J. The practice of nursing research: Appraisal, synthesis, and generation of evidence. Elsevier Health Sciences PP - London; 2012.

Aslam S, Emmanuel P. Formulating a researchable question: A critical step for facilitating good clinical research. Indian J Sex Transm Dis AIDS. 2010;31(1):47.

Abouammoh M, Almater A, Tobaigy M, Younis A, Alaqeel M. Effect of 2019 coronavirus pandemic on ophthalmologists practicing in Saudi Arabia: A psychological health assessment. Middle East Afr J Ophthalmol. 2020;27(2):79.

Al Sulais E, Mosli M, AlAmeel T. The psychological impact of COVID-19 pandemic on physicians in Saudi Arabia: A cross-sectional study. Saudi J Gastroenterol. 2020;0(0):0.

AlAteeq DA, Aljhani S, Altheyabi I, Majzoub S. Mental Health among Healthcare Providers during Coronavirus Disease (COVID-19) Outbreak in Saudi Arabia. J Infect Public Health. 2020;13(10):1432–7.

Alenazi TH, BinDhim NF, Alenazi MH, Tamim H, Almagrabi RS, Aljohani SM, et al. Prevalence and predictors of anxiety among healthcare workers in Saudi Arabia during the COVID-19 pandemic. J Infect Public Health [Internet]. 2020;13(11):1645–51. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7535800

Al-Hanawi MK, Mwale ML, Alshareef N, Qattan AMN, Angawi K, Almubark R, et al. Psychological Distress Amongst Health Workers and the General Public During the COVID-19 Pandemic in Saudi Arabia</p>. Risk Manag Healthc Policy. 2020;Volume 13:733–42.

Alshareef R, Zahrani A Al, Alzhrani M, Suwaidi A, Alamry B. Impact of the COVID-19 Pandemic on Residents' Clinical Training and Psychosocial Well-Being in Saudi Arabia's Western Region. Res Sq. 2020;1.

Alzaid E, Alsaad S, Alshakhis N, Albagshi D, Albesher R, Aloqaili M. Prevalence of COVID-19-related anxiety among healthcare workers: A cross-sectional study. J Fam Med Prim Care. 2020;9(9):4904–10.

Temsah M-H, Al-Sohime F, Alamro N, Al-Eyadhy A, Al-Hasan K, Jamal A, et al. The psychological impact of COVID-19 pandemic on health care workers in a MERS-CoV endemic country. J Infect Public Health [Internet]. 2020;13(6):877–82. Available from: https://www.sciencedirect.com/science/article/pii/S1876034120304871

Zaki NFW, Sidiq M, Qasim M, Aranas B, Hakamy A, Ruwais NA, et al. Stress and psychological consequences of COVID-19 on health-care workers. J Nat Sci Med. 2020;3(4):299–307.

El Keshky MES, Basyouni S, Al Sabban A. The psychological and social impacts on personal stress for residents quarantined for COVID-19 in Saudi Arabia. Arch Psychiatr Nurs. 2020;35(2021):311–6.

Hacimusalar Y, Kahve AC, Yasar AB, Aydin MS. Anxiety and hopelessness levels in COVID-19 pandemic: A comparative study of healthcare professionals and other community sample in Turkey. J Psychiatr Res [Internet]. 2020;129:181–8. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7372275/

Zheng R, Zhou Y, Fu Y, Xiang Q, Cheng F, Chen H, et al. Prevalence and associated factors of depression and anxiety among nurses during the outbreak of COVID-19 in China: A cross-sectional study. Int J Nurs Stud. 2021;114:103809.

Elbay RY, Kurtulmu A, Arpacıo lu S, Karadere E. Depression, anxiety, stress levels of physicians and associated factors in Covid-19 pandemics. Psychiatry Res. 2020;290:113130.

Galbraith N, Boyda D, McFeeters D, Hassan T. The mental health of doctors during the Covid-19 pandemic. BJPsych Bull. 2020;45(2):93–7.

Shechter A, Diaz F, Moise N, Anstey DE, Ye S, Agarwal S, et al. Psychological distress, coping behaviors, and preferences for support among New York healthcare workers during the COVID-19 pandemic. Gen Hosp Psychiatry. 2020;66:1–8.

Zhang SX, Liu J, Afshar Jahanshahi A, Nawaser K, Yousefi A, Li J, et al. At the height of the storm: Healthcare staff's health conditions and job satisfaction and their associated predictors during the epidemic peak of COVID-19. Brain Behav Immun [Internet]. 2020;87:144–6. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7199703/#b0025

Wong AH, Pacella-LaBarbara ML, Ray JM, Ranney ML, Chang BP. 2020. Healing the Healer: Protecting Emergency Health Care Workers' Mental Health During COVID-19. Ann Emerg Med.76(4):379–84.

Badahdah AM, Khamis F, Mahyijari N Al. 2020. The psychological well-being of physicians during COVID-19 outbreak in Oman. Psychiatry Res. 2020;289:113053.

Brubaker L. 2020. Women Physicians and the COVID-19 Pandemic. JAMA.324(9):835.

Buselli R, Baldanzi S, Corsi M, Chiumiento M, Del Lupo E, Carmassi C, et al. 2020. Psychological Care of Health Workers during the COVID-19 Outbreak in Italy: Preliminary Report of an Occupational Health Department (AOUP) Responsible for Monitoring Hospital Staff Condition. Sustainability [Internet]. 2020;12(12):5039. Available from: https://www.mdpi.com/2071-1050/12/12/5039/htm

****