

# The Psychological Impact of COVID-19 Pandemic on King Khalid University Hospital(KKUH)Frontline Staff Nurses

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## Abstract

### Background

Frontline health care workers (HCWs) are among the most vulnerable groups at risk of mental health problems in battling COVID-19 pandemic. In terms of mental health impact of epidemics, HCWs represent a particularly vulnerable group due to the high risk of infection, increased work stress and fear of spreading the infection to their families.

### Objectives

This study assesses the prevalence of stress and burnout among KKUH frontline staff nurses during the COVID-19 Pandemic; to identify the factors associated with stress and burnout and to explore strategies to reduce stress and burnout among frontline staff nurses.

### Methods

Setting: King Khaled University Hospital (KKUH), Department of Emergency, COVID intensive care units (ICUs) and Wards

Sample Size: Purposive sampling of 467 frontline staff nurses who handled suspected/ Confirmed COVID-19 cases.

Data Collection/ Data Source: This is a cross-sectional web survey-based study that was conducted from November 2020 to January 2021. The DASS-21 ( rohtua eht yb uoy ot detnarg noissimrep) was used to measure stress anxiety, and depression. A pre-validated questionnaire was used to investigate job burnout among KKUH frontline staff nurses during the outbreak of the COVID-19 epidemic. Associations between dependent and independent variables were tested using chi-square test.

### Results

Total of 467 staff nurses responded to this survey. 77% of them experienced burnout, 51% had signs of depression and 61% experienced anxiety. Only 30% experienced stress. Mandatorily changing working area to COVID-19 area increased the risk of burnout (OR=2.72, p-value=0.00) and depression (OR=2.82, p-value=0.00). Receiving updated guidelines on safety measures decreased the risk of depression (OR=0.188, p-value=0.00), anxiety (OR=0.224, p-value=0.003) and stress (OR=0.255, p-value=0.00). Having sufficient training on dealing with COVID-19 cases decreased burnout (OR=0.364, p-value=0.00), depression (OR=0.41, p-value=0.00), anxiety (OR=0.545, p-value=0.006) and stress (OR= 0.53, p-value=0.003).

### Conclusion

Although most of the staff nurses have acknowledged the availability of psychological/mental health support in their institution, hospitals would still benefit from further provision of effective interventions to support frontline staff nurse cope with the negative mental consequences of the pandemic.

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## I. Introduction

By the end of 2019, the Coronavirus Disease (COVID-19) first appeared in China, in particular in Whang City, in Hubei province (Wang et al., 2020). In March 2020, due to the global spread of the disease, COVID-19 was declared as a pandemic, causing widespread concern (World Health Organization, 2020). In fact, COVID-19 is an international public health emergency unprecedented in modern history and it causes several health and psychological problems among general population including high level anxiety, depression and stress (Ornell et al., 2020). The COVID-19 pandemic had a massive impact on health care

systems; increasing the risks of psychological distress among health care workers (HCWs). Nurses are particularly vulnerable to many job-related hazards, and undergo a considerable amount of job-related emotional pressure (Wheeler, 1997). This is even more important during a pandemic outbreak of an infectious disease on a global scale, and can lead to stress and job burnout among the HCWs (Mauder et al. 2006).

The frontline healthcare workers are at risk of physical and mental consequences directly as the result of providing care to patients with COVID-19. Even though there are few intervention studies, early data suggests implementation strategies to reduce the chances of infections such as, shorter shift lengths, and mechanisms for mental health support could reduce the morbidity and mortality amongst HCWs (Shaukat et al, 2020).

New York City HCWs, especially nurses and advanced practice providers, experienced COVID-19-related psychological distress (Shechter et al, 2020). Participants reported using empirically-supported coping behaviors, and endorsed indicators of resilience, but they also reported interest in additional wellness resources. Programs developed to mitigate stress among HCWs during the COVID-19 pandemic should integrate HCW preferences (Shechter et al, 2020)

Evidence-based interventions should be adopted and developed to promote a healthy workplace, addressing ethical issues, and preventing burnout among health professionals during the COVID-19 pandemic. The physical and mental health of all HCWs is important for the sustainable delivery of health care in the fight against COVID-19. For this reason, it is important to identify the factors that may cause stress and burnout among HCWs and to develop institutional and national strategies and policies to eliminate these factors and their consequences.

From March 17, 2020 until July 12, 2020, King Khalid University Hospital (KKUH), Riyadh, reported 1,125 and 1,879 positive and negative cases, respectively. In response to hospital COVID-19 outbreak, both COVID Intensive care units (ICU) and wards were opened to accommodate the patients. The hospital maximizes its material and human resources to align with the global, national and local precautionary measures to prevent the spread and containment of the virus. Hospital-wide multidisciplinary efforts have been intensified to detect suspected and confirmed cases for effective isolation and management. Concurrently, the Nursing Department in collaboration and coordination with the Nursing Education and Development have taken the initiatives to formulate contingency plans in combating the worst-case scenario. These include development of clinical pathways, staff cross-trainings, competency enhancement and staff performance auditing and monitoring related to all measures in mitigating the spread of the novel disease. Moreover, one of the significant ongoing actions is to create more COVID-19 units with the redeployment of designated staff nurses to meet the standards of COVID-19 isolation-based precautions and management for both adult and pediatric patients. The mobilization of the nursing workforce who is considered as the frontline against COVID-19 necessitates a strategic measure to foster and sustain an appropriate staffing without compromising the delivery of safe and high-quality patient care. However, during this period of COVID-19 outbreak, there were 179 staff nurses who resigned across units of the Nursing Department which substantially affected the staffing plan. Hence, this study is exploring the psychological impact of COVID-19 on our staff nurses mitigating its effects to staff turnover.

Stress and job burnout not only put individual's health and wellbeing at risk, but also is associated with frequency of medical errors, jeopardies the quality of healthcare services and increase staff turnover (Ornell et al., 2020). Therefore, it is of paramount importance to identify the factors contributing to the job-related stress and burnout among the HCWs. Such knowledge can be devised to protect and preserve the workforce while improving the quality of services provided to the patients.

This study aims to assess the prevalence of stress and burnout among KKUH frontline Staff Nurses during the COVID-19 Pandemic, identify the factors associated with stress and burnout in order to explore strategies to reduce stress and burnout among frontline staff nurses.

## II. Methodology

*Design and setting:* This is a cross-sectional web-based study that was conducted in the Department of Emergency, COVID ICUs and COVID Wards at KKUH between November 2020 and January 2021. KKUH is a tertiary hospital where all patients coming to the Department of Emergency (with or without fever) must be triaged using the Respiratory Screening Tool. Any patient with a total score of greater than four should be further assessed in the flu clinic/ designated area according to the case definition criteria (CDC, 2020). Only those who met the case definition for suspected COVID-19 is to be screened.

Center for Disease Control and Prevention (CDC) defined COVID-19 suspected cases as per the table below.

Clinical Presentation	Criteria
1. Patient with acute respiratory illness (sudden onset of at least one of the following: fever (measured or by history), cough, or shortness of breath)	Not required
2. Patient with sudden onset of at least one of the following:	

headache, sore throat, rhinorrhea, nausea, diarrhea or loss of smell or taste. AND in the 14 days prior to symptom onset, met at least one of the following criteria	Had contact <sup>2</sup> with a confirmed COVID-19 case Or Working in or attended a healthcare facility where patients with confirmed COVID-19 were admitted.
3. Any admitted adult patient with unexplained severe acute respiratory infection (SARI), either Community Acquired Pneumonia (CAP) or Hospital Acquired Pneumonia (HAP).	Not required

However, the COVID-19 confirmed cases were defined as any person who meets the suspected case definition with laboratory confirmation of COVID-19 infection polymerase chain reaction (PCR) (CDC, 2020).

Stable patient in the flu clinic or waiting area or examination rooms should be on droplet contact precautions until COVID-19 is ruled out. Critically ill suspected COVID-19 patients or those requiring aerosolizing procedures must be placed on negative pressure room under airborne and contact precautions until COVID-19 is ruled out. (CDC, 2020) Once the patient is already for admission and with pending PCR result, the patient will be admitted to a designated area for suspected cases. Stable patients and critically ill with confirmed COVID-19 will be transferred to COVID-19 ward and ICU respectively.

*Sampling and recruitment:* There are 500 nurses working in the ER, ICU and different hospital wards.

The questionnaire was sent to them all. Those were all frontline staff nurses who handled suspected/ confirmed COVID-19 cases. Any staff nurse who handled suspected/ confirmed COVID-19 cases in ER, COVID ICUs or Wards, were included.

*Data Collection/ Data Source:* The DASS-21 was used to measure stress. This questionnaire was developed by Lovibond in 1995 to measure stress, anxiety, and depression through 21 items (Lovibond and Lovibond, 1995). The DASS-21 is composed of three sub-scales, each of which encompasses seven questions, with a final score for each scale obtained by summing up the scores of the relevant questions. For each item, the score is an integer number between 0 (*it does not apply to me at all*) and 3 (*it exactly applies to me*). Moreover, the 20 items adapted from the Covid-19 Burnout Questionnaire was used as a tool to investigate job burnout among the KKHU frontline staff nurses during the COVID-19 epidemic (DASS-21; Lovibond and Lovibond, 1995).

*Statistical analysis:* Data were described as numbers and percentages. Statistically significant associations between dependent (demographic variables and occupational factors) and independent (Burnout, depression, stress and anxiety) variables were tested using chi-square test. P-value < 0.5 was considered significant. All statistical analyses were performed using SPSS version 25.

### III. Results

#### Demographic information of the participants

467 of staff nurses responded to the questionnaire. Demographic information about the study participants is shown in table 1. The participants were mainly working in COVID areas (57%) and the rest were working in regular wards. As shown in the table, 34.3% of the nurses had 5-10 years of working experience followed by 28.7% who had 2-4 years of experience. 12% of them had less than one year of working experience. 39.6% were single while, 58.5% were married (Table 1).

#### Burnout, depression and anxiety and stress:

Around 77% of the participants reported signs of burnout while 51% and 61% conveyed signs of depression and anxiety, respectively (Table 2).

Nurses who have work experience from 2 to 10 years, age group from 41 to 50 years, have been positive of COVID-19, exposed to COVID-19 and with signs and symptoms of COVID-19 have experienced burnout the most.

Increasing age was shown to be protective from depression, anxiety and stress. Depression was experienced less by age groups 41-50 and 51 and above in comparison with age group 21-30 (OR=0.514, p-value= 0.02 and OR=0.225, p-value =0.001) respectively. Similarly, anxiety was experienced less by age group 41-50 (OR=0.259) and age group 51 and above (OR=0.348) p-values < 0.05. In addition, age groups 41-50 and 51 and above reported less signs of stress when compared to younger age groups (OR=0.386, p-value=0.003) and (OR=0.372, p-value=0.042) respectively.

Increasing years of experience was associated with more burnout specially to nurses who have 2-4 years of experience and 5-10 years of experience with odds ratios of 3.3 and 2.5 respectively and p-values < 0.00. However, nurses who have more than 21 years of experience been found to have lower risk of depression when compared to those who have less than one year of experience (OR=0.2, p-value=0.039)

Being married decreased the risk of burnout with an odds ratio of 0.48 (p-value=0.002). Married participants had lower risk of having depression (OR=0.64) and anxiety (OR=0.68) in comparison to single participants. Widowed or separated participants had even lower risk of depression and anxiety with OR=0.2 (p-value=0.021) and OR=0.25 (p-value=0.048) respectively.

Psychological support provided by the institution was found to decrease the risk of depression (OR=0.58, p-value=0.006) and stress (OR=0.53, p-value=0.002). Similarly, getting sufficient training about Covid19 was associated with lower risk of depression, anxiety and stress (OR= 0.41, 0.55 and 0.53 respectively) and p-values<0.00. In addition, it was associated with lower level of burnout with an OR=0.36 and p-value=0.00. Receiving appropriate and updated guidelines related to personal safety at work had more protective effect from depression (OR=0.19, p-value=0.00), anxiety (OR=0.22, p-value=0.003) and stress (OR=0.26, p-value=0.00). Mandatory changes to working area increased the level of burnout (OR=2.7, p-value=0.00) and the risk of depression (OR=2.8, p-value=0.00).

Exposure to a positive case doubled the risk of depression (OR=1.9, p-value=0.014) and increased stress by 5.5 times (p-value=0.00). Having flu like symptoms increased the risk of anxiety (OR=2.2, p-value=0.00) and stress (OR=1.6, p-value=0.015). Having positive testing did not show any statistically significant association with neither depression, anxiety nor stress; however, it significantly decreased burnout with an OR= 0.37 (p-value=0.00).

Participants whose household activities were affected by the pandemic experienced burnout 5.2 times more than others (OR=5.2, p-value=0.00) in addition, they were at higher risk of depression, anxiety and stress (OR= 1.9, 2.3 and 2.2 respectively) p-values<0.00.

Larger workload slightly increased depression (OR=1.8, p-value=0.002), anxiety (OR=1.6, p-value=0.03) and stress (OR=1.6, p-value=0.018).

#### **IV. Discussion**

This study looked at the psychological impact of COVID-19 pandemic on KKHU Frontline Staff Nurses. It showed that burnout, anxiety and depression were common among frontline nurses. Furthermore, it showed that age, years of experience, marital status institutional psychological support, training on COVID-19 exposure to a positively tested patient were all associated with at least two elements of the psychological variables included in the current paper i.e. burnout, depression, anxiety and stress. While testing positive, did not have a significant effect on these psychological elements.

The prevalence of burnout and psychological impact of COVID-19 pandemic among HCWs was higher in the current study compared to that published in other countries (Shechter 2020, Maunder 2006, Galanis et al 2021).

Age and years of experience were found to have association with levels of psychological impact of COVID-19 among HCWs. In contrast to previous studies (Aydin Sayilan et al., 2020; Zhang et al., 2020), this study highlighted that older nurses experience less signs of burnout. On the other side, increase age was protective of experiencing signs of depression, anxiety and stress.

Occupational factors significantly affected nurses' burnout during the COVID-19 pandemic. In line with previous studies (Aydin Sayilan et al., 2020; Chen et al., 2020) it was found that nurses working in COVID-19 units and critical care had higher level of burnout and depressive symptoms. Furthermore, training and support of HCWs associated with decrease risk of psychological impact (Hu et al., 2020; Zhang et al., 2020).

Exposure to COVID-19 positive cases had significantly increased the risk of depression and stress. The latter finding does not align with a previous finding that denied direct exposure to a positive case as a primary determinant of adverse psychological outcome (Maunder, 2006). This controversy can be attributed to the variability on the level of preparedness and support provided to HCWs, although most countries were not fully prepared for the pandemic due to its sudden nature. Surprisingly, testing positive did not have significant association with the impact of the psychological variables included in this study.

Okechukwu et al., (2020) stated that high burnout and psychological impact of COVID-19 experienced by nurses, as proven in the current study, may negatively affect the quality of care provided to patients. Furthermore, continuous negative psychological effect may cause post-traumatic stress, suicide ideation and suicide among nurses.

As nurses were recruited from one hospital in Riyadh with a unique system and workload, the findings of this study may not be representative of all hospitals in the country. The timing of the study allowed the depiction of COVID-19 psychological impact among nurses as data were collected during the peak of the pandemic. Further studies could apply multivariate analysis to adjust for confounding factors affecting burnout, depression, stress and anxiety.

Lai J, Ma S, Wang Y,(2020) found out that the explanation for the higher prevalence of burnout among non-physicians could be attributed to the lower dimensions of control (skill discretion and decision authority) compared with physicians. Also, the desire for expectations of appreciation or respect, of the social supports (i.e. from supervisor, coworker, and others), may be an important variable in studies exploring the association between job characteristics and burnout. It is essential that team leaders and peers appreciate members' dedicated work through positive messages of gratitude and support (Matsuo et.al, 2020).

## V. Conclusion:

In KKHU, staff nurses have experienced burnout, depression stress and anxiety regardless of the following factors: marital status, years of experience in KKHU, age, whether working in COVID-19 areas or not, previous pandemic experience, exposure to people with COVID-19. Furthermore, those who have been tested positive have the most been affected their household activities. Most of the staff nurses acknowledged that the institution has made the psychological or mental health support available.

The frontline nurses experienced a variety of mental health challenges, which warrant attention and support from policymakers. Future interventions at the national and organizational levels are needed to improve mental health during this pandemic by building self-efficacy and resilience, providing sufficient social support, and ensuring frontline work willingness.

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Tables

**Table 1. Participants' demographic characteristics**

Variable	N (%)
<b>Working in COVID-19 areas</b>	
Yes	265 (57)
No	202 (43)
<b>Years of experience in KKHU</b>	
Less than 1 year	56 (12)
2-4 years	134 (28.7)
5-10 years	160 (34.3)
11-15 years	62 (13.3)
16-20 years	45 (9.6)
21 years and above	10 (2.1)
<b>Age group</b>	
21-30	102 (21.8)
31-40	238 (51)
41-50	97 (20.8)
51-60	28 (6)
61 and above	2 (0.4)
<b>Marital status</b>	
Single	185 (39.6)
Married	273 (58.5)
Divorced / Widowed	9 (1.9)

**Table 2. Frequencies and percentages of study outcomes**

Variable	N (%)
<b>Depression</b>	
Yes	237 (50.7)
No	230 (49.3)
<b>Anxiety</b>	
Yes	285 (61)
No	182 (39)
<b>Stress</b>	
Yes	139 (29.8)
No	328 (70.2)
<b>Burnout</b>	
Yes	358 (76.7)
No	109 (23.3)

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	Burnout			Depression			Anxiety			Stress		
	OR	95%CI	P-value	OR	95%CI	P-value	OR	95%CI	P-value	OR	95%CI	P-value
<b>Marital status</b>												
Single	Ref			Ref			Ref			Ref		
Married	0.484	0.302-0.775	<b>0.002</b>	0.644	0.442-0.938	<b>0.021</b>	0.676	0.458-0.998	<b>0.048</b>	0.818	0.546-1.227	0.332
Widow/divorcee	1.548	1.187-12.839	0.683	0.208	0.042-1.03	<b>0.035</b>	0.246	0.059-1.017	<b>0.038</b>	0.595	0.120-2.952	0.521
<b>Has your institution made psychological or mental health support available to you</b>												
Yes	0.389	0.233-0.65	<b>0.00</b>	0.581	0.395-0.854	<b>0.006</b>	0.681	0.458-1.014	0.058	0.529	0.352-0.796	<b>0.002</b>
No	Ref			Ref						Ref		
<b>Was this change voluntary or mandatory</b>												
Mandatory	2.717	1.661-4.443	<b>0.00</b>	2.816	1.726-4.594	<b>0.000</b>	1.222	0.768-1.944	0.397	1.149	0.69-1.913	0.594
Voluntary	Ref			Ref						Ref		
<b>Years of experience in KKUH</b>												
Less than 1 year	Ref			Ref			Ref			Ref		
2-4 years	3.309	1.574-6.959	<b>0.001</b>	1.123	0.599-2.107	0.717	0.906	0.466-1.761	0.771	0.681	0.356-1.305	0.246
5-10 years	2.53	1.268-5.047	<b>0.007</b>	0.879	0.472-1.602	0.653	0.789	0.414-1.506	0.473	0.702	0.373-1.322	0.272
11-15 years	1.003	0.467-2.151	0.995	0.582	0.281-1.208	0.145	0.505	0.239-1.070	0.073	0.493	0.224-1.088	0.078
16-20 years	0.587	0.262-1.313	0.193	0.49	0.22-1.09	0.079	0.453	0.202-1.019	0.054	0.442	0.182-1.069	0.067
21 yrs & above	1.198	0.278-5.166	0.808	0.202	0.039-1.036	<b>0.039</b>	0.474	0.122-1.847	0.275	0.172	0.02-1.451	0.073
<b>Age group</b>												
21-30	Ref			Ref			Ref			Ref		
31-40	1.247	0.701-2.218	0.452	0.651	0.406-1.045	0.075	0.63	0.381-1.043	0.071	0.645	0.398-1.046	0.074
41-50	0.446	0.239-0.833	<b>0.01</b>	0.514	0.292-0.904	<b>0.020</b>	0.459	0.255-0.825	<b>0.009</b>	0.386	0.206-0.727	<b>0.003</b>
51 and above	0.904	0.343-2.381	0.837	0.225	0.091-0.555	<b>0.001</b>	0.348	0.151-0.802	<b>0.011</b>	0.372	0.14-0.989	<b>0.042</b>
<b>Working in COVID-19 areas</b>												
Yes	1.328	0.863-2.042	0.196	0.855	0.593-1.233	0.402	1.258	0.865-1.83	0.229	0.925	0.62-1.379	0.702
No	Ref			Ref						Ref		
<b>Work experience during previous pandemics</b>												
Yes	0.829	0.536-1.282	0.399	0.809	0.557-1.175	0.266	1.060	0.723-1.554	0.764	0.707	0.466-1.072	<b>0.102</b>
No	Ref			Ref						Ref		
<b>Exposed to person who has been diagnosed or had symptoms suggestive of COVID-19 infection</b>												
Yes	2.662	1.515-4.679	<b>0.00</b>	1.995	1.142-3.486	<b>0.014</b>	1.617	0.942-2.777	0.080	5.518	2.16-14.096	<b>0.000</b>
No	Ref			Ref						Ref		
<b>Have you experienced flu-like symptoms or symptoms suggestive of COVID-19 infection</b>												
Yes	0.81	0.523-1.252	0.342	1.395	0.959-2.030	0.081	2.183	1.463-3.258	<b>0.000</b>	1.649	1.102-2.468	<b>0.015</b>
No	Ref			Ref						Ref		
<b>Did you test positive for COVID-19</b>												
Yes	0.369	0.227-0.598	<b>0.00</b>	0.761	0.486-1.193	0.233	1.045	0.66-1.655	0.851	1.072	0.66-1.742	0.778
No	Ref			Ref						Ref		
<b>Did you receive specific training related to the COVID-19 pandemic</b>												
Yes	0.683	0.379-1.233	0.204	0.877	0.551-1.396	0.580	0.983	0.61-1.582	0.943	0.78	0.476-1.279	0.324
No	Ref			Ref						Ref		
<b>Do you feel this training was sufficient</b>												
Yes	0.364	0.205-0.646	<b>0.00</b>	0.408	0.268-0.622	<b>0.000</b>	0.545	0.353-0.842	<b>0.006</b>	0.531	0.346-0.813	<b>0.003</b>
No	Ref			Ref						Ref		
<b>Did you receive appropriate guidelines on updated procedures related to personal safety to follow at work</b>												
Yes	1	0.417-2.397	0.999	0.188	0.071-0.501	<b>0.000</b>	0.224	0.077-0.653	<b>0.003</b>	0.255	0.119-0.546	<b>0.000</b>
No	Ref			Ref						Ref		
<b>Larger work load</b>												
Yes	0.825	0.529-1.285	0.394	1.821	1.238-2.679	<b>0.002</b>	1.553	1.042-2.313	<b>0.03</b>	1.636	1.087-2.461	<b>0.018</b>
No	Ref			Ref						Ref		
<b>Effect on household activities</b>												
Yes	5.234	3.167-8.648	<b>0.000</b>	1.918	1.184-3.108	<b>0.008</b>	2.263	1.406-3.643	<b>0.001</b>	2.243	1.234-4.076	<b>0.007</b>
No	Ref			Ref						Ref		