Occupational Stress Assessment of Health Care Workers (HCWs) facing COVID-19 Patients in the Hospital of Eastern Province in Sri Lanka

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Abstract: <u>*Background*</u>*: The health care workers (HCWs) at the frontline of fighting COVID-19 are at higher risk for mental health problems, including stress, anxiety, depression, and insomnia. This study aimed at assess the status of occupational stress in the three occupational groups of nurses, physicians and hospital cleaning crew facing COVID-19 patients in hospitals of eastern province in Sri Lanka.* <u>*Methodology*</u>*: This cross-sectional descriptive analytical study was performed on 300medical staffs including nurses, physicians and cleaning crew facing COVID-19 patients working in different hospitals. Demographic information form and occupational Stress Questionnaire (HSE tool indicator) were used to collect data. The health and safety executive (HSE) questionnaire has 35 questions and 7 areas, which was developed in the 1990s by the UK Health and Safety Institute to measure occupational stress.* <u>*Results*</u>*: The mean score of total dimensions among HCWs was 2.93. Communications, Manager Support, Changes and Demand factors with scores of 2.76, 2.77, 2.83 and 2.87 had the greatest impact on participants' stress levels, respectively. Also, Colleague support factor with a score of 3.38 had the least effect on stress levels. Also, according to the results, 87% of nurses, 79% of cleaning crew and 67% of physicians had a partial to high levels of stress that, on average, 77.5% of the HCWs participating in this study had at least a small amount of stress.* <u>*Conclusions*</u>*: The mean stress score among the participants of the present study was between high stress level and moderate stress level. Factors such as communications, manager support, change and demand had the greatest impact on employee stress levels. Therefore, by improving the communication between people working in hospitals, increasing managers' support for staff and reducing workplace demands such as reducing workload and improving workplace environment, the stress level of staff in hospitals during the outbreak of COVID-19.*

Keywords: HCW, COVID-19, Health care worker, stress

1. Introduction

1.1 Back ground

Healthcare workers on the front lines against COVID-19 may face increased workload and stress. Understanding their risk for burnout is critical to supporting health care workers and maintaining the quality of healthcare during the pandemic.

The COVID-19 pandemic commenced at the end of 2019 and has been exponential since inception. It is the biggest global health crisis ever experienced in the modern world. The health crisis clearly has an impact on the stress levels of individuals that can lead to forthcoming public health crisis. Many studies have focused on the stress and concern of healthcare professionals. However, studies that compared the stress of physicians to other health care staff are sparse. The characteristics of pandemic-related stress in a context of such magnitude are new and may present some specific features, such as concerns for the future. Some consequences of this pandemic seem to influence people's stress levels, such as isolation due to lockdowns and the fear of contagion, which can induce chronic stress (Sohrabi C et al 2020].

The disruption of professional environments secondary to containment measures has been heterogeneous, forcing workers to interrupt their professional activity while some others maintained regular working routines. This was the case for healthcare professionals who had to continue their work despite the risks inherent to the pandemic. Work is already known as a major source of stress for individuals.

Nevertheless, the pandemic-related dimension of occupational stress in healthcare professionals, and particularly between medical doctors and paramedical staff, were not reported to our knowledge. Because of their profession, healthcare professionals have had to maintain or even increase their professional workload. At the onset of the crisis, the lack of known treatment forced healthcare professionals to optimize only symptomatic treatments, isolate patients and provide supportive care. Healthcare staff played a pivotal role in this part of patient care. In the absence of a clearly established "cure", "care" predominated. Certain socio-demographic factors such as gender or age can also influence the level of stress at work and thus represent a risk factor. This is the case among nurses, where women are more stressed than men. Age appears to be a protective factor for all workers during the pandemic and older people have developed specific coping strategies that preserve them from high levels of stress. Showing whether the occupation had an influence on the level of work-related stress could make it possible to better identify the populations at risk to implement targeted actions.

On the other hand, Health care workers have been working for a long time without meeting their elderly parents or their children during this COVID crisis. Death of a coworker due to COVID is another threatening factor for their smooth healthcare delivery .wearing heavy personal protective kits for a long hot environment and regular heavy duty hours are the few embarrassing factors for the health care workers.

2. Literature Review

In December 2019, multiple cases of pneumonia of unknown origin that share similar presentation were reported in Wuhan city, Hubei province of China. The immense scientific efforts directed to find out the causative agent behind this clinical entity revealed a novel single-stranded RNA virus was behind these cases [Zhu et al,2020). The virus was named Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). Later, this acute respiratory illness was referred to as Coronavirus Disease 2019 or COVID-19.The extensive and rapid spread of the COVID-19 on a global scale has prompted the World Health Organization (WHO) to characterize it as a global pandemic in March 2020 (Jones, 2020). As of April 19, 2021, this global pandemic has already resulted in more than 141 million confirmed cases and the death toll surpassed 3 million deaths globally [WHO, 2020)]. Jordan, a middle-income country located in the Middle East, was also afflicted by the pandemic, and this has forced the government to impose various stringent control strategies to contain its spread. A nationwide lockdown for approximately 2 months and a half was enforced by the Jordanian government as one of the control measures. The lockdown alongside other declared measures has placed the general population including healthcare workers under a new experience that possessed social, emotional, psychological, and financial impacts [A. Raoofi et al,2020) . As of April 19, 2021, the total number of confirmed COVID-19 cases, active cases, and deaths in Jordan were 689,482, 36,688, and 8308, respectively, with a surge since early September 2020 (WHO, 2020). The sudden and accelerated rise in the number of COVID-19 cases has imposed an additional burden on decision-makers, healthcare professionals (HCPs) as well as the general population in the country [(WHO, 2020).In addition, professional issues have been reported to lead to stress among nurses. For example, Evans (2002), in a Yorkshire, UK study exploring the district nurses' perception of occupational stress, found that job image and reward systems were among the six major stress factors for the nurses. Similarly, public health nurses in Taipei, Taiwan reported that lack of recognition in the workplace was a significant stressor among nurses. Stacciarini and Troccoli (2004) in their study of occupational stress, job satisfaction and state of health in Brazilian nurses, reported that lack of recognition, lack of status of the nursing profession, lack of autonomy, low salaries, lack of resources, and assignments outside the individual's specialty were sources of stress for health care workers.

Ethical conflicts are another factor that had been identified as sources of job related stress and anxiety (Begat, Ellefsen, & Severinsson, 2005). According to Begat and colleagues, ethical dilemmas arise because of nurses' values and desires to provide high-quality care. This is in agreement with McGrath et al. (2003) findings that too little time to perform duties to one's satisfaction and rationing of resources and services resulted in moderate to high stress. In providing essential services and health care support, the average nurse's daily workload to meet up with the clinical requirements of patients is enormous (Ogundipe, Obinna, & Olawale, 2015). In a resource challenged country like Nigeria, there is an acute shortfall of nurses. The Human Resources Information System (HRIS) Qualify data from the Nursing and Midwifery Council of Nigeria revealed there are far fewer nurses and midwives available than expected to provide much-needed health services to Nigerians (Obinna, 2012). According to Natukunda (2008) Nigeria has less than 150,000 registered nurses to cater for an estimated 160 million population, giving an average nurse population ratio of 1 to 1066 people. According to Kang et al., medical staff working in Wuhan hospitals in China due to Occupational exposure to high risk of infection and inadequate and low protection against infection, high workload, frustration, exposure to patients with negative emotions, long distance from family and fatigue were under a lot of stress which led to mental health problems such as stress, anxiety, depressive symptoms, insomnia, denial, anger and fear. As a result of these psychological problems affects understanding and ability of decision making of the staff occupied in fighting COVID-19, as well as their general health. This study also states that maintaining the mental health of medical staff is effective in controlling the pandemic caused by the disease and their long-term health .With all these conditions, Due to the effect of mental health of medical staff in controlling the pandemic caused by COVID-19 virus, the effect of high stress on the incidence of human error in the staff, less examination of the mental health problems of medical staff during COVID-19 pandemic and also considering the fact that so far, no holistic study is done on occupational stress caused by this disease in these staff in Iran hospitals, the present study is designed to Determining the status of occupational stress in HCWs (including nurses, cleaning crew, Doctors) exposed to COVID-19 patients.

3. Methodology

3.1 Subjects and sampling method

This cross-sectional descriptive study is performed on 350medical staff exposed to COVID-19 patients working in different hospitals in 2021. Sampling method is done randomly.

3.2 Study design

The purpose of the study was fully explained to the subjects. The researchers refused to go to the hospital and talk to the treatment staff participating in the study in order to follow the COVID-19 health protocols, and an electronic version of the questionnaire was sent to the participants via email and WhatsApp social media.

3.3 Data collection tools

Demographic information form and occupational Stress Questionnaire (health and safety executive (HSE) tool indicator) were used to collect the data.

The questionnaire has 30questions and 7 areas, which was developed in the 1990s by the British Institute for Health and Safety to measure occupational stress

3.4 Statistical analysis

Descriptive statistic indices (frequency, percentage, mean and standard deviation) are used to analyze the data. Independent t-test and one way ANOVA are used to compare quantitative variables between two groups and for more than two groups, respectively.

3.6 Ethics approval and consent to participate

In the present study all participants were above 18 years old and signed an informed consent form prior to taking part in the study.

4. Results

According to power analysis of 80%, a total of 350 questionnaires were sent to different HCWs and then 290 questionnaires were returned. Therefore, the response rate of this study is 83%.

4.1 Demographic information

The demographic information among study groups was indicated in Table 1.

Table 1: Demographic information of the study groups (N = 350).

	Gender		Marital Status		Work experience	Age range	Shift work selection		Shift work satisfaction	
	Male	Female	Single	Married			Obligatory	Voluntary	Yes	No
Nurses (N = 200)	120	80	72	128	8 ± 5.3	29 ± 7.5	160	40	124	76
Cleaning crews (N = 100)	68	32	43	57	3 ± 2.1	26 ± 3.2	65	35	56	44
Physicians (N = 50)	24	26	20	30	16 ± 6.8	34 ± 8.3	22	28	31	19

4.2. Occupational stress assessment

According to the objectives explained above, occupational stress assessment in the present study in the three occupational groups of nurses, cleaning crew and physicians was performed as follows:

4.2.1. Occupational stress assessments of nurses

The results of occupational stress assessment findings in nurses are shown in Table 2. The mean total score of the dimensions among nurses was obtained in the range between moderate to high stress level (2.31. There was a significant relationship between the mean score of total dimensions and work experience (p-value = 0.013), type of shift works (p-value = 0.037) and job satisfaction (p-value = 0.013). According to statistical tests in nurses, there was no statistically significant relationship between the mean score of total dimensions with gender, age and marital status (p-value> 0.05). Finally, results showed that the relationship between work satisfaction with dimension of manager support, demand and control was significant (P-value <0.001).

Table 2: Mean and standard deviation (SD) of occupational stress score and its dimensions among nurses and effects of occupational factors (n = 180).

Dimensions of occupational stress		Role	Communication	Manager support	Colleague support	Control	Demand	Changes	Mean score of total dimensions
Gender	Male	2.03 ± 0.63	2.48 ± 0.86	2.37 ± 0.78	3.11 ± 0.51	2.08 ± 0.51	2.14 ± 0.83	2.03 ± 0.62	2.32 ± 0.71
	Female	2.26 ± 0.58	2.23 ± 0.91	2.49 ± 0.61	2.79 ± 0.46	2.17 ± 0.72	2.20 ± 0.86	2.01 ± 0.68	2.30 ± 0.64
	P. Value	0.059	0.065	0.411	0.064	0.608	0.632	0.637	0.208
Marital status	Single	2.06 ± 0.64	2.46 ± 0.78	2.30 ± 0.64	2.44 ± 0.76	2.01 ± 0.78	2.27 ± 0.77	1.87 ± 0.62	2.20 ± 0.81
	Married	2.19 ± 0.60	2.30 ± 0.43	2.52 ± 0.82	3.30 ± 0.51	2.20 ± 0.45	2.09 ± 0.92	2.13 ± 0.78	2.39 ± 0.59
	P. Value	0.43	0.408	0.32	<0.001	0.245	0.134	0.065	0.23
Work experience	0-10	2.21 ± 0.57	2.31 ± 0.89	2.03 ± 0.41	3.02 ± 0.58	2.39 ± 0.84	2.01 ± 0.69	2.02 ± 0.74	2.28 ± 0.76
	10-20	1.96 ± 0.61	2.42 ± 0.81	2.33 ± 0.80	2.96 ± 0.63	1.94 ± 0.70	2.04 ± 0.64	2.03 ± 0.61	2.24 ± 0.74
	20-30	2.19 ± 0.65	2.35 ± 0.76	2.95 ± 0.83	2.96 ± 0.75	2.03 ± 0.72	2.43 ± 0.78	2.01 ± 0.49	2.41 ± 0.69

Table 3 shows the results of the occupational stress assessment findings among the cleaning crew of COVID-19 sections. The mean score of total dimensions among the cleaning crew was 2.91 which were in the range between moderate and high stress level and also 79% of the participants had a slight to high stress level. There is a statistically significant relationship between the mean score of total dimensions of occupational stress with type of shift work (p-value <0.001) and job satisfaction (p-value = 0.02). However, the study of statistical tests in the cleaning crew showed that there is no statistically significant relationship between the mean score of total dimensions with gender, age and marital status and work experience (P > 0.05). There was a significant relationship between communications and work experience (p-value <0.001). There was also a significant relationship between the dimension of manager support and type of work shift (p-value <0.001). In addition, there was a significant correlation between colleague support and work experience and the type of work shift (p-value <0.001). And also, There was a significant correlation between control and age (p-value <0.001).

Table 3: Mean and standard deviation (SD) of occupational stress score and its dimensions among the cleaning crew group and effects of occupational factors (n = 69)

Dimensions of occupational stress		Role	Communication	Manager support	Colleague support	Control	Demand	Changes	Mean score of total dimensions
Gender	Male	3.25 ± 0.41	2.77 ± 0.73	2.06 ± 0.79	3.88 ± 0.90	2.94 ± 0.85	2.94 ± 0.87	3.05 ± 0.20	2.98 ± 0.54
	Female	2.93 ± 0.67	2.75 ± 0.66	1.92 ± 0.58	3.86 ± 0.83	3.13 ± 0.74	2.76 ± 0.40	2.81 ± 0.44	2.88 ± 0.64
	P. Value	0.059	0.65	0.45	0.765	0.451	0.342	0.231	0.43
Marital status	Single	3.26 ± 0.37	2.83 ± 0.59	1.92 ± 0.44	3.99 ± 0.99	2.93 ± 0.87	3.02 ± 0.78	2.99 ± 0.35	2.99 ± 0.66
	Married	3.04 ± 0.72	2.70 ± 0.81	2.11 ± 0.57	3.77 ± 0.80	3.05 ± 0.66	2.78 ± 0.89	2.98 ± 0.39	2.91 ± 0.34
	P. Value	0.081	0.341	0.128	0.087	0.47	0.076	0.613	0.067
Work experience	0-10	3.22 ± 0.42	2.70 ± 0.91	1.90 ± 0.30	3.35 ± 0.82	2.83 ± 0.69	2.99 ± 0.67	3.08 ± 0.41	2.86 ± 0.74
	10-20	3.20 ± 0.81	2.17 ± 0.73	2.10 ± 0.45	4.13 ± 0.91	2.04 ± 0.89	2.73 ± 0.79	2.82 ± 0.46	2.74 ± 0.48
	20-30	3.00 ± 0.64	3.41 ± 0.62	1.82 ± 0.50	3.35 ± 0.72	2.95 ± 0.79	2.95 ± 0.77	3.04 ± 0.38	2.93 ± 0.32
	P. Value	0.564	<0.001	0.065	<0.001	0.39	0.069	0.054	0.107

The results of occupational stress assessment findings in COVID-19 physicians can be seen in Table 4. The mean score of total dimensions among physicians was 3.53 which showed that the level of stress among physicians was between low and moderate stress levels. The results also showed that 69% of physicians had moderate to high levels of stress. There is a statistically significant relationship between the mean score of total dimensions in physicians with work experience (p-value = 0.004) and job satisfaction (p-value <0.001). However, according to the statistical study, there is no statistically significant relationship between the mean score of total dimensions of occupational stress with gender, age and marital status (p-value> 0.05

5. Discussion

The aim of this study was to assess occupational stress among HCWs exposed to COVID-19 patients in selected wards of three hospitals in Sri lanka. For this aim, the demographic information form and the questionnaire of the British HSE indicator tool were used. The results showed a higher level of stress in nurses compared to the cleaning crew and physicians. Accordingly, the stress level of the cleaning crew is higher compared to doctors. Although the score related to the dimension of manager support (2.43) has a higher value compared to other dimensions, but it is still at the red level (stress level between medium and high) and shows its effect on stress levels in this occupational group. In the cleaning crew, the lowest score obtained was related to manager support (2.02), which had the main effect on the stress level of this job group. In this occupational group, the score obtained in the dimensions of communication (2.76), demand (2.89) and changes (2.98) also have lower values compared to other dimensions. In the physicians, the lowest score obtained was related to the dimension of communication (3.16),. Also in this study, there was a significant correlation between the mean dimension score and job satisfaction in all occupational groups and the results showed that job satisfaction has an effect on the stress level. Also in the cleaning crew, there is a significant relationship between the mean total score of dimensions and job satisfaction. Accordingly, in the study of Kerr et al., which was conducted on occupational stress of jobs related to health and social services, a positive correlation was observed between the final score of the HSE questionnaire and job satisfaction .Also in the study of Ferrie et al., a positive correlation was observed between different parts of

the HSE questionnaire (such as role and changes) and mental health . Which are in consistent with findings.

In addition, in a study by Khalid et al., which was performed on HCWs (including nurses, physicians, and respiratory therapists) exposed to MERS-CoV, stress was divided into four levels of very low (score 0), partial (score 1), and moderate (score 2) and very high (score 3), which the mean score of the participants in this study was about 2.43 (moderate to very high stress level) . The mean stress score obtained by all job groups in the present study was 2.63 (moderate to high stress level), which shows a close similarity with the study of Khalid et al.

6. Conclusion

According to our findings, mean score of total dimensions was 2.80, which indicates the stress level between high stress to moderate stress. The factors such as Communications, Manager support, Changes and Demand with scores of 2.76, 2.77, 2.83 and 2.87 had the greatest impact on participants' stress levels, respectively. Colleague support with a final score of 3.38 had the least effect on stress levels in all three occupational groups. Accordingly, It seems factors such as high workload, low response time at the peak of hospital visits, lack of adequate support from top managers of all job groups equally, lack of access to adequate personal protective equipment, unpreparedness of managers and staff to respond to the critical and emergency situations influenced stress level among participants. Therefore, the results of this study can be used as a reference for further measures, including the implementation of interventions during the pandemic to reduce occupational stress and maintain work stability and increase the quality of life of medical staff.

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