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Exploring Determinants Linked to Depression, Anxiety, and Stress among Healthcare Shift Workers amidst the COVID-19 Pandemic

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Abstract

Aim: The COVID-19 pandemic has significantly impacted the healthcare sector. This study aimed to evaluate depression, anxiety, stress, and associated factors among healthcare shift workers.

Methods: The study included healthcare shift workers directly involved in managing COVID-19 cases in Klang Valley, Malaysia. Participants' mental health status was assessed using the Depression, Anxiety, and Stress Scale-21 (DASS-21). Factors examined included sleep quality, physical activity, and dietary habits. Pearson's $\chi2$ and simple multivariate binary logistic regression models, employing the Hosmer-Lemeshow approach, were used to identify relevant factors.

Results: A total of 413 participants were recruited. Overall, 40.7% of participants exhibited symptoms of depression, anxiety, or stress. Poor sleep quality was significantly associated with all three psychological outcomes. Inactivity was strongly linked to symptoms of depression and anxiety, while dietary habits showed a strong association with anxiety and stress.

Conclusion: The findings highlight the importance of addressing modifiable factors- such as sleep quality, physical activity, and diet- to mitigate mental health issues among medical shift workers.

Keywords: SARS-COV-2; COVID-19; Depression; Anxiety

Introduction

Shift work is a common feature in various economically developed countries like Canada, the United Kingdom, France, Russia, and Malaysia. However, it often brings about mental health issues, fatigue, physical ailments, household disorganization, and strained familial relationships. Working during night and early morning shifts disrupts the natural circadian rhythms, impacting metabolic health, cardiovascular health, cancer risk, and mental well-being. Such disruptions not only contribute to various diseases but also increase the likelihood of workplace errors and diminished job performance [1-3]. The COVID-19 pandemic has further exacerbated the challenges faced by healthcare workers, who have been thrust into the forefront of managing the crisis. In Malaysia, the pandemic has significantly heightened the demand for healthcare services, placing immense strain on frontline workers' mental health. Shortages of personal protective equipment (PPE), hospital beds, and other essential medical supplies have intensified the stress and burnout experienced by these workers. Research from the Ministry of Health's Institute for Health Behavioural Research indicates that approximately 14.2% of healthcare workers have experienced severe mental health issues during the pandemic. Studies conducted during this period have revealed alarming levels of psychological distress among communities, stemming from factors such as loss of loved ones, travel restrictions, job insecurity, and financial difficulties caused by the pandemic [4, 5]. Examining the psychological impact of the pandemic on frontline healthcare shift workers is imperative given the disruptions it has caused. Studies analyzing healthcare workers' work hours during the pandemic have shown a correlation between longer working hours and heightened levels of burnout and stress. Prolonged exposure to patients, extended periods of wearing PPE, sleep deprivation, and poor dietary habits further exacerbate these psychological effects. Additionally, multiple risk factors- including gender, health status, economic status, and occupational differences- can exacerbate the psychological burden on healthcare workers [6].

Material and Methods

This cross-sectional study enrolled healthcare workers aged 19 to 60 years who were employed at a hospital in Klang Valley, Malaysia, and directly managed COVID-19 cases by working at least three shifts per year. The study drew participants from hospitals across the Klang Valley, which experienced the highest number of COVID-19 cases in Malaysia. Among the 14 public hospitals in the Klang Valley, those directly involved in treating COVID-19 cases were selected for inclusion. Participants were randomly recruited using a stratified random sampling method [7].

Inclusion criteria comprised fluency in Malay or English and Malaysian citizenship among medical staff, while individuals diagnosed with sleep disorders and/or psychiatric disorders were excluded. Sample size calculations determined that 392 participants were needed based on previous research highlighting the relationship between physical activity and psychosocial problems in shift workers. The study received approval from the Medical Research Ethics Committee and the National Medical Research Registry (code reference NMRR-19-2796-50756), and informed consent was obtained from all participants.

Demographic data revealed a predominance of females (81.1%), consistent with prior studies among shift workers and healthcare professionals. The majority of participants were under the age

of 40 (89.1%), as individuals typically ascend to senior positions and transition to office-hour schedules after this age. Notably, the emergency room was the primary department introducing three-shift work, accounting for the majority of participants.

Several studies conducted during the pandemic have identified alarming levels of psychological distress in communities, potentially linked to factors such as loss of family members, travel restrictions, work disruptions, and financial challenges stemming from COVID-19. Given these themes, it was deemed pertinent to investigate the psychological impact of the pandemic on frontline healthcare shift workers who have been grappling with its disruptive effects [8]. Research on healthcare workers' working hours during the pandemic has indicated that longer shifts are associated with heightened levels of burnout and stress, compounded by prolonged contact with patients or specimens, extended periods of PPE use, sleep deprivation, and suboptimal dietary habits. These psychological effects can be exacerbated by various risk factors, including gender, health status, economic standing, and occupational disparities

Study design and subjects

This cross-sectional study enrolled healthcare workers aged 19 to 60 years who were employed at hospitals in the Klang Valley region of Malaysia and directly managed COVID-19 cases by working a minimum of three shifts per year. The study included participants from hospitals across the Klang Valley, selected due to the region reporting the highest number of COVID-19 cases in the country. Among the 14 public hospitals listed in the Klang Valley, only those directly involved in treating COVID-19 cases were included. Participants were recruited randomly using a stratified random sampling technique.

Inclusion criteria comprised proficiency in Malay or English and Malaysian citizenship among medical staff, while individuals diagnosed with sleep disorders and/or psychiatric disorders were excluded from the study. Sample size calculations were conducted using the opine toolkit with a 95% confidence interval, a significance level of 0.05, and a precision level of 5%, resulting in a required sample size of 392 participants. The study received approval from the Medical Research Ethics Committee and the National Medical Research Registry (code reference NMRR-19-2796-50756), and informed consent was obtained from all participants.

Demographic data indicated a predominance of females (81.1%) in the study, consistent with previous research among shift workers and healthcare professionals. As with other studies, this research primarily focused on a specific occupational group of healthcare workers, mitigating biases related to varying shift schedules across different workplace types. The majority of participants were under the age of 40 (89.1%), as individuals typically ascend to senior positions and transition to office-hour schedules after this age. Notably, the emergency room was the primary department introducing three-shift work, resulting in a higher proportion of participants from this sector.

Factors associated with psychiatric symptoms across the sample

The results of the univariate analysis of psychotic symptoms across the sample are detailed in the Supplementary Material. Specifically, findings indicated that young, single women with limited work experience, particularly those working on the front lines, exhibited higher scores on each subscale. Conversely, individuals with children tended to have lower scores on each subscale. Marital status was only significantly associated with the DAS total score and the depression subscale

score, with post hoc analysis revealing higher scores among those living alone compared to those living with a spouse or children. Coexisting medical conditions and a diagnosis of COVID-19 were not found to be correlated with psychiatric symptoms.

To assess the independent effects of various demographic and occupational factors on DAS total scale scores, multiple linear regression analysis was conducted. The analysis revealed that being female, young, having a history of psychiatric illness, and working on the front lines were independently associated with poorer psychiatric outcomes. Additionally, individual regression analyses were performed to ascertain the effects of these factors on the DAS subscale scores for depression, anxiety, and stress. Results indicated that being female, young age, and lifetime psychiatric disorders were associated with higher scores on the depression and anxiety subscales, as well as the stress subscale. Moreover, frontline work was independently associated with higher scores on all three subscales, except for the DAS anxiety score, which showed no significant association with age.

Limitations

To our knowledge, this study represents the first investigation into the psychological effects of the COVID-19 outbreak on healthcare workers in Turkey. However, several limitations should be considered. Firstly, the cross-sectional design of the study lacks longitudinal follow-up, and data collection was completed within a short period of 6 days. While this timeframe was necessitated by the urgent nature of the emergency, it limits our ability to track changes over time. Nonetheless, the findings offer insights into the immediate needs of physicians and can inform the implementation of early intervention measures.

Additionally, the spontaneous nature of the survey may have introduced selection bias, as respondents may not be fully representative of the entire population. Furthermore, the use of self-report questionnaires, rather than diagnostic assessments by mental health professionals, to evaluate symptoms may have implications for the accuracy of the findings. Specifically, this study focused solely on the levels of depression, anxiety, and stress among doctors, omitting assessments of social support and PTSD, which could provide further insights into the psychological impact of the pandemic on healthcare workers.

Despite these limitations, the results contribute valuable information regarding the early psychological repercussions of COVID-19 among physicians across various specialties in Turkey. This knowledge can aid health authorities worldwide in implementing targeted measures to mitigate the psychological toll of this unprecedented global pandemic on healthcare professionals.

Discussion

The first confirmed case of the COVID-19 outbreak in Turkey was reported on March 11, 2020, prompting rapid adjustments to the healthcare system, including the conversion of inpatient units into COVID-19 wards and the deployment of doctors from various specialties to the front lines. Non-emergency leave for healthcare workers was also suspended for three months. Undoubtedly, this unprecedented crisis has taken a toll on healthcare workers' mental health. Our study sheds light on concerns regarding mental health among healthcare workers, revealing that during the early stages of the outbreak in Turkey, 64.7% of doctors experienced depressive symptoms, 51.6% experienced anxiety, and 41.2% experienced stress-related symptoms. A significant proportion of participants exhibited moderate to severe psychiatric symptoms. This aligns with findings

from a previous study conducted among medical professionals in China during the COVID-19 outbreak [9]. Our research identified several factors associated with mental health outcomes. Being married and having children were associated with lower scores on mental health measures, while younger age, female gender, less experience, and frontline work were associated with higher scores. Additionally, living with a spouse or children was linked to lower scores compared to living alone. Regression analysis revealed that being female, young, having a history of mental illness, and frontline work were independent predictors of poorer mental health across various measures. Similar to findings from other studies, excessive workload was associated with psychological symptoms. Efforts should be made to ensure reasonable working hours, adequate rest periods, and rotating shifts for healthcare workers. Additionally, logistical support, including access to personal protective equipment and safe working environments, is crucial for mitigating negative emotions such as lethargy, hopelessness, and guilt. Our results also highlighted the importance of peer and supervisor support in promoting psychological well-being. Providing opportunities for healthcare workers to discuss their experiences, share concerns, and receive support can help alleviate feelings of loneliness and stress. Clear guidelines and protocols for job preparation, disease information, and self-protection measures are essential for boosting confidence and reducing stress among frontline workers [10].

Conclusion

In conclusion, our study underscores the significance of sleep quality, physical activity, and dietary habits in the mental health of medical shift workers. Addressing these modifiable factors can contribute to the psychological well-being of healthcare workers during the COVID-19 pandemic. Future research should focus on longitudinal studies to confirm the causal relationship between these factors and mental health outcomes among shift workers, guiding the development of interventions and health policy directions in the workplace.

Acknowledgement

None

Conflict of Interest

None

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