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Original

Occupational Stress and Resilience among Nurses in the Time of Covid-19 Pandemic

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ABSTRACT

Background: During Covid-19 pandemic, nurses are one of the most important job groups who experience high levels of stress. This study aims to compare occupational stress and resilience among nurses working in COVID-19 and non-COVID-19 wards. **Methods:** In this cross-sectional study, 130 nurses participated. To determine the occupational stress and resilience, Osipow Occupational Stress Inventory (OSI) questionnaire and Connor-Davidson Resilience Scale (CD-RISC) were used as collecting data tools, respectively. **Results:** The total stress score (176.63±15.86 versus 164.47±13.21, p= 0.02) was significantly higher, while the mean score of resilience was significantly lower (65.61±2.75 versus 78.76±2.61, p<0.001) in nurses working in COVID-19 wards, compared with the nurses in other wards. After adjusting for confounders, there were statistically significant associations between occupational stress and control subscale of resilience and between resilience and hospital wards (COVID-19 and non-COVID-19 wards). **Conclusion:** The present study's findings indicated that nurses working in COVID-19 wards have higher stress and lower resilience than nurses in other wards.

Keywords: Occupational Stress; Resilience; Nurses; Covid-19 Pandemic

Introduction

The work environment of nurses plays a significant role in the occurrence of psychological stress due to uncertain employment status, ambiguity in authority, heavy workload, dealing with morbidity of patients, organizational problems and conflict of physicians regarding workplace violence, different work shifts, and lack of psychological support.[1] The coronavirus pandemic, which began in the Chinese city of Wuhan in December 2019, triggered a vast public health challenge worldwide.[2]

According to the information published by the Ministry of Health of the Islamic Republic of Iran, the first confirmed case of Covid-19 was reported on February 19, 2020, in Qom Province. [3]

During the COVID-19 pandemic, nurses as one of the groups of people fighting against the COVID-19 virus, are more likely to experience psychological stress, including anxiety, depression, stress, fear, apprehension, affective disorders, exhaustion, and sleep disorders.[4, 5]

In a study conducted on 2285 healthcare workers during the COVID-19 pandemic in China, the

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prevalence of insomnia, anxiety, depression, and overall psychological problems was 28.75%, 46.04%, 44.37%, and 56.59%, respectively.[6]

In the early stages of the epidemic, some epidemiology studies found that stress due to heavy workload, insufficient personal protective equipment, lack of knowledge regarding the pathogen, and direct contact with patients was increased in the healthcare workers. [7]In this condition, factors related to the job lead to changes in psychological and physiological status.[8]

Stress was reported to be responsible for high costs of health care services and poor quality of the work of nurses in the 20th century.[9, 10]

Resilience as a positive adaptation enables individuals to maintain or regain mental health, cope effectively with stress, and withstand adversity.[11]

It has been reported that enhancing nurses' resilience is associated with decreased risk of burnout, improved job satisfaction, and reduced turnover intentions. This is especially true for diseases related to pandemic outbreak, such as COVID-19.[12]

During the pandemic, stress affects the general population. However, nurses working in high-risk areas who provide patient care are more affected by stress. Therefore, the mental health status of nurses during the COVID-19 pandemic becomes an important issue which we need to address.

Methods

This cross-sectional study was done in February, 2021. A total of 65 nurses working in COVID-19 wards and 65 nurses working in non-COVID-19 wards of Imam Khomeini Hospital, located in Iran, were chosen by the census method.

After obtaining a written informed consent from the patients, questionnaires regarding demographic characteristics, occupational stress, and resilience were administered to all participants.

The Osipow Occupational Stress Inventory (OSI) was introduced in 1981 and has also been revised many times. The questionnaire consists of 6 dimensions: role overload, role insufficiency, role ambiguity, role boundary, responsibility, and physical environment. Each of the six mentioned dimensions was assessed by ten items. Options included never, occasionally, sometimes, usually, and most of the time, scoring from 1 to 5 respectively. [13] In Iran, the reliability of this questionnaire in Sharifian's study with Cronbach's alpha of 0.83 had been confirmed.[14]

Connor-Davidson Resilience Scale (CD-RISC) was developed by Kathryn M. Connor and Jonathan R.T. Davidson as a means of assessing resilience.[15] The CD-RISC is the ability to cope with stress. For the first time in Iran, the reliability of this questionnaire in Mohammadi's study with Cronbach's alpha method of 0.78 had been confirmed.[16]

The CD-RISC consists of 25 questions and five subscales including:

- personal competence, high standards, and tenacity (competence)
- trust in one's instincts, tolerance of negative emotions, and strengthening effects of stress (negative effect)
- acceptance of change and secure relationships (secure relationships)
- control
- spiritual influences

Each subscale is rated on a 5-point scale from 0 (absolutely false) to 4 (always true). The highest score that a person can get is 100, and the lowest score is zero. Higher scores show more significant levels of resilience.[17]

Data were analyzed using SPSS software (version 21, SPSS Inc., Chicago, IL, USA). The Chi-square test was used to assess the distribution of sex between the studied groups. The means of the continuous variables were compared using student's t-test. To determine occupational stress and resilience predictors, the linear regression model included age, work history, sex, hospital wards (COVID-19 and

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non-COVID-19 wards), and subscales of resilience and occupational stress. A P-value of less than 0.05 was considered statistically significant.

Results

The mean age and work history of nurses working in the COVID-19 wards were 35.13±7.12 and 9.05±4.64, respectively. The corresponding values for the nurses in the non-COVID-19 wards were 36.23±6.42 and 10.19±6.34, respectively. The percentage of females among nurses in COVID-19 and non-COVID-19 wards were 59.1% and 53.5 %, respectively. There was no significant difference between the groups regarding the demographic data (p> 0.05).

The results obtained from OSI analysis are shown in Table 1. There was a higher mean for nurses working in COVID-19 wards regarding role ambiguity (28.42±5.00 versus 26.24±2.57, p = 0.03), role boundary (28.56±6.92 versus 30.51±2.85, p = 0.05), physical environment (30.85±5.64 versus 22.02±4.29, p <0.001), total stress (176.63±15.86 versus 164.47±13.21, p = 0.02) in comparison with the nurses working in the non-COVID-19 wards.

The mean scores of resilience subscales for the nurses working in the COVID-19 and non-COVID-19 wards are summarized in Table 2. There was a significantly lower mean for nurses of COVID-19 wards regarding all of the subscales, when compared with nurses of non-COVID-19 wards (p < 0.001).

Multiple linear regression was used to predict occupational stress based on resilience subscales demographic and job variables. As shown in Table 3, the control subscale significantly predicted the occupational stress in the sample. An increase of one unit in the control subscale resulted in a 6.77 unit decrease in job stress.

The results obtained from the multiple linear regression of predictors of resilience are shown in Table 4.

As shown in Table 4, hospital wards significantly predicted resilience in the sample. A significantly lower resilience was found in the nurses of COVID-19 wards compared with the nurses in non-COVID-19 wards.

Table 1. Mean Scores of Occupational Stress in the Studied Groups.

	COVID-19 wards	Non-COVID-19 wards	P-value
OSI	Mean±SD	Mean±SD	
Role overload	31.27±4.16	29.47±3.34	0.20
Role insufficiency	27.51±5.57	27.41±2.85	0.90
Role ambiguity	28.42±5.00	26.24±2.57	0.03
Role boundary	28.56±6.92	30.51±2.85	0.05
Responsibility	30.02±4.34	28.83±3.32	0.31
Physical environment	30.85±5.64	22.02±4.29	<0.001
Total stress	176.63±15.86	164.47±13.21	0.02

Table 2. Mean Scores of Resilience Subscales in the Studied Groups.

CD-RISC	COVID-19 wards Mean±SD	Non-COVID-19 wards Mean±SD	P-value
Personal competence, high standards, and tenacity	20.76±1.39	25.39±1.52	<0.001
Trust in one's instincts, tolerance of negative emotions, and strengthening effects of stress	19.27±1.34	18.54±1.25	0.001
Acceptance of change and secure relationships	11.39±1.30	17.51±1.38	<0.001
Control	8.42±0.95	10.41±1.07	<0.001
Spiritual influences	5.76±1.04	6.91±0.62	<0.001
Total	65.61±2.75	78.76±2.61	<0.001

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Table 3. Predictors of occupational stress based on resilience subscales and demographic and job variables

	B	SE	Beta	t	P-value
Age (years)	-1.75	1.44	-0.56	-1.22	0.23
Work history (years)	2.11	1.47	0.66	1.44	0.15
Sex*	-3.17	5.19	-0.06	-0.61	0.54
Hospital wards**	7.20	16.43	0.13	0.44	0.66
Personal competence, high standards, and tenacity	1.48	1.71	0.15	0.87	0.39
Trust in one's instincts, tolerance of negative emotions, and strengthening effects of stress	1.73	1.99	0.08	0.87	0.39
Acceptance of change and secure relationships	-0.15	1.89	-0.02	-0.07	0.94
Control	-6.77	2.56	-0.35	-2.65	0.01
Spiritual influences	2.68	2.93	0.10	0.91	0.36

*Reference category: males. ** Reference category: Non-COVID-19 wards

Table 4. Predictors of Resilience Based on Occupational Stress Subscales and Demographic and Job Variables

	B	SE	Beta	t	P-value
Age (years)	-0.21	0.15	-0.25	-1.40	0.16
Work history (years)	0.19	0.15	0.22	1.24	0.22
*Sex	-0.51	0.55	-0.04	-0.93	0.35
**Hospital wards	-13.63	0.69	-0.96	-19.67	<0.001
Role overload	0.04	0.05	0.04	0.86	0.39
Role insufficiency	-0.08	0.07	-0.05	-1.18	0.24
Role ambiguity	0.002	0.07	0.001	0.02	0.98
Role boundary	-0.08	0.07	-0.06	-1.16	0.25
Responsibility	0.07	0.05	0.06	1.34	0.18
Physical environment	0.009	0.04	0.01	0.20	0.84

*Reference category: males. ** Reference category: non-COVID-19 wards

Discussion

In this study, the effects of COVID-19 on occupational stress and resilience were determined. Results confirmed that nurses providing care for corona patients experience higher levels of stress than nurses of other wards .

Similar to the present study's findings, Said and El-Shafei conducted a research on 210 nurses from COVID-19 triage hospitals, and 210 nurses from a hospital without triages COVID-19 patients. 75.2% of nurses working in the COVID-19 triage hospitals showed a high-stress level, compared with a 60.5% level in another hospital.[18]

Shirali et al. reported a significantly higher total stress score of 194.16 ± 22.21 in Iranian nurses compared to 183.07 ± 21.52 in controls.[9]

Ahorsu et al. reported increased job stress and decreased mental health in 516 emergency nurses during the covid-19 pandemic.[19]

In the study conducted by Shen et al. 55%, 45%, 41.2%, 28%, 26%, and 2% of the Intensive Care Unit (ICU) Nurses experienced fatigue, difficulty sleeping, nervousness, frequent crying, and even suicidal thoughts, respectively, in the time of COVID-19.[20] Similar findings had been reported by others.[21-23]

Failure to employ efficient prevention methods for COVID19, lack of personal protection equipment, multiple glove layers, heat stress, the quarantine time period, fear of infection, hopelessness, lack of energy, lack of resources, financial losses, and mortality might explain the reasons of stress among the nurses.[9, 24]

In the study by Said and El-Shafei, stressors of the highest priority among nurses caring for COVID-19 were workload (98.6%), dealing with death and dying (96.7%), fears and personal demands (95.7%), stigma (90.5%), and employing strict biosecurity measures (95.2%).[18]

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Studies during the COVID-19 pandemic have indicated that psychosocial factors like anxiety, depression, and job stress reduce resilience in individuals.[9]

We observed a decreased resilience in the nurses working in COVID-19, compared with nurses working in other wards.

Similarly, in Shirali's study, total scores and all the scores for subscales of resilience, with the exception of spiritual influences, were significantly lower in nurses, in comparison to the control group (total score: 59.62 ± 14.02 vs. 63.93 ± 10.48).[9]

The results of a study in Turkey reported that increasing resilience of nurses can increase mental, leading to stable psychological functions. [25]Yilmaz et al. studied the effects of resilience as a strategy to face work environment challenges, and showed that nurses could adapt better to their work environment.[25]

Fourur et al.[26] and Lim et al.[27] also reported that an increase in resilience was related to a decrease in job stress in nurses. Lupe et al. demonstrated that resilience could be helpful in decreasing stress during the outbreak of the COVID19 virus.[28]

Resilience includes elements like hope and desire to fight and overcome problems; therefore, it plays an important role in decreasing stress caused by covid-19 viruses in most people.[9]

In the present study, after controlling the confounders, the authors observed significant associations between occupational stress and control subscale of resilience, and resilience score and hospital wards .

This finding is consistent with that of Said and El-Shafei. [18] They reported that the type of hospital and its related workload were significant predictors of occupational stress, job satisfaction, and the nurses' intent to leave their present job.

Given the findings of this study, to reduce the nurses' stress and increase their resilience, personnel training together with their participation in decisions and use of documented guidelines were recommended.[29]

A limitation of this study was the small sample size. Therefore, further studies with a large sample would be necessary.

Conclusion

No statistically significant differences were observed in the confounding variables of age, sex, and work history between two groups of nurses in the present study. Therefore our findings show that increased occupational stress and decreased resilience in the nurses working in COVID-19 wards, in comparison to other nurses, is likely the result of dealing with COVID-19 patients. Improving resilience by managing workload will help nurses to cope with stress.

Conflict of interest

The authors declare that there is no conflict of interest.

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Authors Contribution

All authors have reviewed, approved, and consented to the submission, and they are accountable for all aspects of its accuracy and integrity.

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