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Investigation of Occupational Stress and Depression among Nurses in COVID- 19 Wards Compared to other Ward: A Study in Imam Reza Hospital of Mashhad in 2021

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ABSTRACT

Introduction:
Today the main question is whether all nurses working in the Covid and non-Covid hospitals departments were equally affected by stressors and anxiety producing during the corona pandemic. Therefore, this research is aimed to investigate the occupational stress and depression rate in Coveid-19 wards compared to other words during the corona virus pandemic.

Materials and Methods:
This research was descriptive-analytical study conducted in Imam Reza hospital of Mashhad, Iran during 2019-2022. The sample size was 144 nurses, including 72 nurses worked in Covid-19 wards and 72 nurses from the other wards. The research tools were two questionnaires including Expanded Nursing Stress Scale (ENSS), and Depression Short Inventory (BDI) which their validity and reliability were confirmed. Chi-square and two- sample T-test, and Kolmogrov-Smirnov test was utilized for analytical results employed. Inferential statistical methods were used for analytical results by SPSS software.

Results:
No differences was reported between stress rate among two groups nurses. Moreover, despite the higher average of depression score among nurses worked in the Covid wards, the difference was not statistically significant.

Conclusion:
It is not possible to comment with certainty about the differences in the level of stress, anxiety and depression between nurses who worked in the Covid wards compared to other hospital wards. But all nurses worked in hospitals were exposed to physical, and mental problems during Covid pandemic period. Therefore, we suggest the nursing policymakers and senior managers to allocate the comprehensive support program for nurses to improve their quality of work life.

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Introduction

The emergence of Covid- 19, was introduced to the world as a global health emergency by the World Health Organization (WHO) has presented a major challenges to healthcare employees, who were the first to face it (1). It has been estimated that nurses account for 75% of the healthcare team (2). The spread of the disease has added to the already constant job stress of nurses, resulting in a dramatic increase in workload and referrals (3). Job stress has led to a shortage of employees, heavy responsibilities, excessive workload, unplanned and disorganized shifts, conflicts among co- workers (4), lack of sleep, difficulty concentrating, and facing patients in unpleasant and isolated conditions, all while being aware of highly contagious nature of the disease (5). In this life threatening situation, nurses are facing new challenges, including the fear of becoming infected, the loss of colleagues, and a lack of effective social support in the healthcare system, which can lead to the development of disorders (6).

During the outbreak of coronavirus, more studies conducted on medical and healthcare employees have revealed covid-19 pandemic has had adverse effect on health of nurses (7, 8). The physical and mental health of nurses was vital for them to perform their duties with maximum efficiency (9). High levels of stress and anxiety during the covid-19 pandemic led to increase making mistakes and errors in the job performance of nurses' duties (10). Stressors can lead to a sense of inferiority that can cause depression, which in turn increases work tension and reduces the efficiency, and finally can represent mental and neurotic disorders (11).

Therefore, it is important to explore anxiety levels in healthcare professionals especially nurses to maintain a safe and effective healthcare system during Corona virus pandemic generally (12).

Studies indicate that workers who endure high levels of stress at their workplace have had more occupational accidents (13).

Occupational stress has been called an epidemic problem by WHO, and the United Nations (UN) referred to it as the disease of the 21th century (14). Approximately, 30% of nurses working in the hospitals during Covid-19 pandemic faced mental complications caused by this disease. This highlight providing more studies to explore the situation of psychological impact among the nurses during this pandemic (15).

Xin Shen et al. declined that Covid- 19 pandemic accelerated great psychological pressure among ICU nurses in Wuhan, especially young nurses with low work experiences faced a greater psychological crisis (16). Also, Yuanyuan et al. confirmed the work stress among Chinese nurses exposured to Corona virus pandemic who were generally under presence (17). In addition Murat et al. reported nurses played extraordinary played extraordinary rate in challenging with corona virus pandemic among healthcare system employees. In this period, nurses were constantly faced with stressful and depression situation that cause emotional exhaustion caused nurses to experience burnout more rapidly experiencing depressive and stressful symptoms (18).

Corona virus pandemic also caused many psychological and social problem among the nurses in Iran. Bagheri Sheykangafshe et al. indicated that no relationship was reported between non-public hospitals nurses with psychological disorders during Covid- 19 pandemic from July to September 2021 (19). Bakhtiari et al indicated more than half of the emergency nurses were exposed to mental health abnormalities during the Covid- 19 pandemic in Zanjan hospitals from January to May 2022 (20).

Asadi at al. showed that nurses working in Corona wards suffered from moderately anxiety studied as a cross- sectional research in Kerman hospitals in 2020 (21).

As Tabatabai et al. declared in a descriptive-analytical study in Arak city found psychological capital and clinical performance deceased among the nurses working in corona wards in Arak city's hospitals (22). Moreover, Raesi et al found that nurses worked in the corona virus ward had a significant higher mean score of acute fatigue than those in the general virus ward (23). Also, Raesi et al, reported managerial, personal, and physical patient care, and interpersonal factors were identified as sources of stress in nurses working in covid-19 wards (24).

Therefore, this research was aimed to investigate the occupational stress and

depression rate among nurse in Corona virus clinical wards compared to other wards in Imam Reza hospital of Mashhad, Khorasan Razavi province, Iran. Among nurses worked in corona virus clinical wards compared to other nurses worked in the other wards during corona virus pandemic. In the other words, the most important question of present study whether the rate of occupational stress and depression in nurses who worked in corona words was the same as compared to nurses who worked in other hospitals wards during the corona pandemic.

Materials and Methods

This research was a cross- sectional, descriptive and analytical study focused on 550 nurses working in the wards related to Covid- 19 and other wards at Imam Reza hospital in Mashhad, Khorasan Razavi province. The sample size was determined to be 144 individuals based on Krejcie &Morgan table, including 72 nurses from the Covid- 19 wards and 72 nurses from other wards.

Inclusion criteria included participants having at least one year of work experience and actively being present in Covid- 19 wards for at least on month. Exclusion criteria for this study included non- cooperation, as well as the presence of psychological or anxiety disorders.

After obtaining approval from Khorasan Razavi University of Medical Science ethics committee and coordinating with the hospital's nursing and executive managers, we explained the aim of the research to each individual and obtained informed consent forms from all participants, ensuring their confidentibility.

We used the social networks for sending the questionnaires for participants because of possible risk of contamination of Covid- 19 virus. The researchers asked participants nurses in different shifts filled the questionnaires out by the end of their work shifts. The questionnaires were completed through self- reports. Ultimately, we received and completed 144 questionnaires, which included having response rate equal 100%. Therefore we have no missing data in this research. The revised version of the Expanded Nursing Stress Scale (ENSS) and Depression Short Inventory (BDI- S), in addition demographic information including age, gender, work experiences, work shift, and the ward in which the nurses worked.

ENSS questionnaire, which was developed by Gary Taft and Anderson in 1981, comprises 57 item and 9 subscales that cover a broad range of topics, including death and dying, conflict with physicians, lack of optional preparedness, problems with peer support and supervisors, workload, uncertainty concerning treatment patients, their families, and discrimination (25). The respondents rate of each item was on a five-point Likert scale, ranging from 'never stressful'=1, ' occasionally stressful'=2, 'frequently stressful'=3, ' extremely stressful'=4, and do not apply=5. A high score on any subscale was indicative of high job-related stress in that particular area. Ghanei et al. conducted a study on the questionnaire's reliability and found it to be 0.96 (26). Also Saedpanah et al. reported the Cronbach alpha level of this questionnaire as 0.85, and its internal reliability as a 0.92 (27), and also by Zakiyah et al. reported as 0.89 (28).

The Beck Depression Inventory Short (BDI-S) is a 13- item self-reporting questionnaire for evaluating the severity of depression in normal and psychiatric population (29).

Scoring of this questionnaire indicates as below:

- Good self-image and denies possible depression= 0-4
- Absence or the lowest level of depression= 5-9
- Mild to moderate depression= 10-18
- Moderate to severe depression= 19-29
- Severe depression= 30-39

Kliem et al. reported the reliability of this questionnaire in Germany as 0.84 by Chronbach alpha method (30), and indicated by Rajabi and Karaju Kasmai as 0.84 in Iran (31). Face validity of BDI and ENSS questionnaires were confirmed by a group consisting 15 nursing, clinical psychologists and health care management specialists. As a result, they reported the acceptability of the questionnaires and coverage of questions to cover the entire content of the test, and determining that there was a consensus among the members of the focus group regarding the confirmation of the face validity of the questionnaires. In addition, to determine the Content validity Ratio (CVR) of

the BDI and ENSS questionnaires for transparency reference and comprehensiveness of questions, separate questionnaires were provided for members of the panel of experts, and they were asked to freely express their opinions and ideas about the items that needed to be modified, removed, and added to the questionnaires. To determine the Content Validity Ratio (CVR) of the BDI and ENSS questionnaires, the research tools were provided for members of the panel of experts, and they were asked to freely express their opinions and ideas about the items that needed to be modified, removed, and added to questionnaires. Consequently, the CVI for these two questionnaires were more than 75%. Moreover , the content validity Index (CVR) measured for mentioned BDI and ENSS to confirm their applicability, simplicity, fluency, relevance, clarity, or transparency of each question of questionnaires calculated greater than 0.79. SPSS software (v. 21) was employed for data analysis. The data was expressed as mean± standard deviation (SD) and number (percentage). A chi- square test was conducted to examine the relationship between two variables. Additionally, we estimated the contrast in quantitative variables between the two groups with a two-sample t- test. Furthermore, the Kolmogorov-Smirnov test was utilized to verify data normality.

Results

Out of total of 144 nurses participating in current study, 72 (50%) were working in the COVID clinical wards and the rest of them 72 (50%) were working in the non- COVID wards, including infectious disease, gynecological, internal medicine, surgery, pediatrics. The average age of nurses in the COVID ward was 35.61±6.76 and in the non-COVID ward, was 33.84±8.00.

The results of the K^2 test revealed there were not significant correlation between education level, gender, work shifts and age of nurses among two groups including those who worked in COVID and those in other wards. But the work experiences variable had significant difference between nurses working in Covid clinical wards and non-COVID wards (P= 0.015).

Therefore, it seems work experiences of nurses worked in Covid- 19 ward were more than nurses' work experiences worked in the other wards.

Table 1: Description of demographic variables in the Covid and non- Covid Wards

Variables		COVID ward	Non- COVID wards	P-Value
		Frequency (Percent)	Frequency (Percent)	
Education level	BSc.	59 (80)	50 (70)	0.187
	MSc.	15 (20)	12 (30)	
Gender	Female	38 (52)	36 (50)	0.829
	Male	34 (48)	36 (50)	
Work shifts	Morning	23 (31)	36 (50)	0.546
	Night	40 (55)	20 (27)	
	Rotation	11 (14)	16 (23)	
Work experiences	<5 years	13 (18)	25 (34)	0.015
	5-15 years	43 (60)	24 (34)	
	15-30years	16 (22)	23 (32)	
Age (year)		35.61±6.76	33.84±8.00	0.161

According to the Kolmogorov- Smirnov test, the distribution of variables was normal in this study. The average workload score in the COVID ward was 2.08±0.67, which was higher than the non- COVID wards (1.85±0.67). This difference was statistically significant (P= 0.047). Also, the average score of patients and their families' workload in the COVID group was 2.03±0.65, and in the non- COVID group, it was 1.75±0.64. Therefore, this difference was statistically significant (P= 0.008). However, other dimensions of the ENSS questionnaire showed no significant difference between these two group (P>0.05). Although, the difference between nurses' stress worked in the Covid ward and the other wards was not statistically significant (P>0.05) (Table 2).

Table 2: Description of the ENSS questionnaire among the nurses by division of work wards

		COVID ward		NON- COVID ward		P-Value*
Scale	**Subscales and number of items**	**Mean**	**SD**	**Mean**	**SD**	
ENSS questionnaire	Death and dying-7 items	2.13	0.71	2.01	0.67	0.329
	Conflict with psysicians-5 items	2.01	0.74	1.86	0.76	0.229
	Inadequate preparation -4 items	1.82	0.84	1.63	0.80	0.180
	Problems with peers- 6 items	1.66	0.71	1.47	0.56	0.077
	Problems with supervisors- 7 items	1.94	0.93	1.87	0.96	0.674
	Workload - 9 items	2.08	0.67	1.85	0.67	0.047
	Uncertainty concerning treatment- 8 items	2.16	0.75	2.04	0.71	0.319
	Patients and their families - 8 items	2.03	0.65	1.75	0.64	0.008
	Discrimination- 3 items	1.46	1.26	1.28	1.25	0.414
	Total- 57 items	1.98	0.65	1.81	0.61	0.113

The other results of current research showed the average depression score among nurses worked in COVID ward was 5.37±6.35, while in other wards, it was 4.55±6.01 indicated the nurses worked in Covid wards experienced more depression compared with nurses worked in other wards. Moreover, most of nurses worked in Covid and non- Covid wards expressed no depression signs, and none of them reported depression signs. Despite the higher average depression score among nurses worked in the COVID ward, the difference was not statistically significant (P=0.430).

Table 3: Description of depression levels among nurses worked in the COVID and non- COVID wards

Level of depression	**Total Score**	**Covid Ward Frequency (Percent)**	**Non- Covid Ward Frequency (Percent)**
Normal	<4	45 (62)	45 (63)
Mild mood disturbance	5-10	19	12 (17)
Borderline clinical depression	11-19	4 (6)	12 (17)
Moderate depression	20-30	4 (6)	5 (6)
Severe depression	31-40	0	0

Discussion

The study aimed to investigate the level of occupational stress and depression among nurses working in Covid patient- related wards and to compare the results with those of other hospital wards. The findings showed that the average total stress score in the COVID ward was higher than in other wards, although this difference was not statistically significant (P>0.05). Amiri et al. found occupational stress was greater among nurses exposed to COVID- 19 in educational hospitals in Ahvaz, Iran compared to nurses worked in other wards. Also, the mean of nurses' stress exposed to Covid- 19 was significantly correlated with gender (32). However Jamali et al. found no significant correlation between job stress of nurses working in Covid- 19 wards and nurses working in other clinical wards conducted in Imam Reza and Ghaem hospitals in Mashhad, Iran (33). Yosefi et al. reported overall stress in nurses with a history of activity in infectious wards were less than other wards (34). It seems healthcare professional workers such nurses are exposed to increased stress levels due to lack of sufficient resources, financial loss, and lack of safety regulations and requirements considerations (35- 36).

The result of current research in this issue are relatively compatible with other research results according to research population and types of hospitals management and leadership in different provinces of Iran.

In the present study, a significant correlation was observed between the nurses' workload in Covid and non- Covid department (P=0.047). Hoogendoorn et al. found nurses were confronted with a high workload from 2020 to 2022, worked in Covid departments of six hospitals in Netherland was higher the nurses worked in other nurses (37). In a cross- sectional study was conducted from 5 th to April 5 th 2020 by Shoja et al. in Iran showed that nurses who encountered Covid- 19 patients had more scores in mental pressure, time pressure, and

frustration compared to the other nurses not exposed to Covid- 19 patients (38).

The other findings of the current study demonstrated nurses was dealing with patients and their families in Covid- 19 clinical departments were required to address patients and their family dissatisfaction and complaints while also providing psychological support to them. The communication with and involvement of patients' family pattern in hospital care changed enormously during the Covid- 19 pandemic. In this reason, Maaskant et al. reported that nurses worked at two university hospitals in Netherland experienced high stress due to the visiting restrictions in the Covid-19 clinical wards in comparison with non-Covid- 19 clinical wards (39). Moreover, facing the violent behaviors of patients' family by nurses was a widespread phenomenon which contributes to increasing occupational stress. Also, the Covid- 19 pandemic has exposed the worlds nurses' population to intense stress. Therefore, Chirico etal. Indicated that physical and psychological workplace violence such as Covid- 19 patients' family members was perpetrated by personal relationships (40).

We reported there were no correlation between nurses working in the clinical Covid-19 wards and non- Covid- 19 wards with their death and dying, conflict with physicians, emotional preparation, problems with supervisors and colleagues, uncertainly about treatment and discrimination. Ze- Houg Zheng et al. investigated the self- competence and self- efficacy among nurses working in clinical Covid- 19 isolation wards and non-Covid- 19 wards between February and April 2020, reported nurses who worked in Covid-19 clinical wards had more self- efficacy and motivation while exposure and fighting against Covid- 19 compared with nurses worked in non- Covid- 19 wards (41).

Cardoso et al. indicated that during the critical Covid- 19 pandemic period, the nurses providing care to patient with Covid- 19 had more fear toward death which were higher than nurses exposed with non- Covid- 19 patients (42).

In addition, factors such as having problems with peers and supervisors investigated in the current study which reported no difference was obtained between nurses worked in Covid- 19 hospitals wards and the other nurses in Covid- 19 hospitals wards and the other nurses worked in non- Covid clinical wards. Kagan et al. found that most challenges related to Covid- 19 pandemic for nurses were nurse managers' sense of purpose, duty and pride compared with their peers and subordinate nurses in Covid- 19 wards and challenging communication with the other nurses' staff and peers worked in other hospital clinical wards (43). Also, Cadge et al. showed that one of the most challenges of nurses during Covid-19 pandemic period were working with new co- workers and teams, involved in new maintaining of job and working relationship among nurses worked in Covid- 19 hospitals' clinical wards (44).

The results of current researches' related to nurses' attitude worked in Covid- 19 clinical wards toward their death and dying and having problems with their peers and supervisors were not compatible with other researchs' result because of the type nationality and organizational culture and type and level of education perceived by the nurses during Covid- 19 pandemic.

However, Munoz- Quiles et al. reported there were four conflicts between nurses and physicians worked in Covid- 19 clinical wards including ignoring values and moral interactions as a key sources of conflict, loss of shared semantic, ethical, and moral concepts between nurses and physicians, lack of confidence in performance, and self-punishment as personal condemnation (45).

Moreover, Falco- Pegueroles et al. declined that there were five factors identified the conflicts arisen between nurses and physicians during Covid- 19 pandemic including management of resources, protection of nurses, decision working, end of life care, and communication (46) that none of mentioned studies were similar with current study.

Regarding no significant correlation between emotional preparation uncertainty about treatment, discrimination, and two group of nurses worked in Covid- 19 and non Covid- 19 hospitals clinical as items of stress in present study, Mashnad Alreshidi et al. conducted through a cross- sectional, web-based survey in Saudi Arabia reported most nurses were committed to continue work as a

prossional and ethical duty showed emotional preparedness to exposure to Covid- 19 patients (47). This results was similar to our study regarding emotional preparedness and job commitment. Although, Huang et al. found from February 1st to February 20 th 2020 in Anhui in China during Covid- 19 pandemic period the nurses exposed to Covid- 19 patients in clinical wards had stronger the anxiety and anger compared participants worked in non- Covid-19 hospitals (48) that are not compatible with the results of current study. In addition, Nelson et al. used a phenomenological methodology in the early stages of Covid- 19 pandemic through the voices of the participants and reported the nurses worked and exposed to Covid- 19 patients had emotional challenges included stress, anxiety, exhaustion, frustration, guilt and loneliness which caused uncertainty through leadership and communication challenges (49) that was not similar to our results of study, respectively. Moradi et al. Also explored the challenges by ICU nurses throughout the provision of care for Covid- 19 patients indicated four challenges during corona virus disease including organizational inefficiency in supporting nurses, physical exhaustion, living with uncertainty and psychological burden of the disease among nurses working in corona virus clinical wards (50). Regarding the discrimination as final item of ENSS questionnaire measured among two groups of nurses which was not significant correlated with each other, Soleimani et al. found highest level of discrimination belonged to refusal of physicians and nurses to physically examine the patients (51).

Moreover, low level of perceived discrimination was reported in current study determined to prevent discriminatory behaviors in medical settings to improve the hospitalization experience and disease outcomes. A qualitative study conducted by Abanit Asa et al. in Indonesia from April to May 2022 revealed that there was a negative impact of community doubt and distrust around Covid- 19, and distress due to stigma and discrimination towards nurses caring for Covid- 19 patients and their families (52). The final results of current research showed that there was no significant difference between nurses' anxiety worked in Covid- 19 clinical wards and non- Covid wards. Also, most of the participants in there two groups did not experienced the signs of anxiety. Covid- 19 pandemic has brought healthcare in general and nurses in particular into the limelight as never before. It is import to study the intensity of this pandemic on these profession (53).

In many countries, nurses were working under virtual siege from this pandemic, with not enough personal protective equipment, overwhelming numbers of patients, staff shortage underprepared health systems and supply chain failures (54). Psychological problems were the most abnormality among the nurses exposed to Covid- 19 pandemic. As Al Maqbali et al. reported, 93 studies published between January 2020 and September 2020, the pooled prevalence of anxiety was 37% (55). Yurt seven and Arsalan Also declared 85% of nurses had high anxiety levels worked in university hospitals (56). Although Tamraker et al. showed there was no statically significant differences in the prevalence of anxiety between Covid and non- Covid nurses in Nepal (57). However, Young Doo et al. found that anxiety and depression were significantly higher in nurses working with patients suspected to have Covid- 19 rather than nurses working with confirmed Covid- 19 patients (58). Tercan et al. reported that there was a significant differences between the nurses providing and not providing Covid- 19 care for depression scores (59). However, Milgrom et al. reported that hospital workplace of nurses worked in Covid- 19 treating and non- treating hospitals had not significant correlation with each other for stress and anxiety symptoms (60). The comparison between the results obtained from present study and other researches in terms of the presence of anxiety among nurses who worked in the clinical Covid department and non- Covid department showed that the social and cultural situation of hospitals, the job requirement and laws and commitment of nurses during the Covid-19 pandemic cause differences or no differences between two nurses group.

Limitation

The limitations of any field study are magnified when the realities of taking the

concepts and techniques developed in one culture are applied to another culture. Also, one of the main limitation of the present study is that, it was conducted at one specific time. Second, the participants were conducted by questionnaires as self-assessment. Third many other factors that influenced the nurses worked in clinical Covid- 19 and non-clinical Covid- 19 has not been included in our research. Forth, our study was conducted only among one general and public hospital in Mashhad, so, the results may not be generalized to all public and general hospitals in Iran.

Conclusion

What is certain is that during the Covid- 19 pandemic, nurses exposed to various restrictions and challenges, including threats to their physical and mental abnormality. Although the factors such as nurses' work experiences and number of patients and patients' family members in the present study showed a significant difference between the two groups of nurses in the Covid and non Covid hospitals departments. However, some other studies did not confirm the results of present study. It seems that there were no significant difference in terms of stress and anxiety and depression between nurses worked in the Covid and non- Covid departments. Therefore, we suggest nursing senior managers and policy makers that nurses should benefit from special support programs in terms of finance, welfare, physical and mental health in Iranian health system for improving so that their quality of work life, they could be were efficient in the conditions of emergencies and possible epidemics and pandemics without any worries and intellectual involvement with light productivity.

Ethical Consideration

Ethical issues, including informed consent, misconduct, data fabrication and/ or falsification, double publication, redundancy, etc. have been completely observed by the authors.

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