Original Article

Professional Quality of Life among Iranian Clinical Nurses at the Forefront of the Fight against COVID-19: A Multicenter Cross-Sectional Study

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Abstract

Background: With the prolonged COVID-19 disease control time, concerns about the caring ability of clinically exposed nurses have increased. This study aimed to investigate Compassion Satisfaction (CS), Burnout (BO), and Secondary Traumatic Stress (STS) as elements of Professional Quality of Life among nurses in COVID-19 settings. **Materials and Methods:** In this descriptive online national survey, 427 clinical nurses who had worked in the COVID-19 wards from all Iran provinces answered the Persian version of the Professional Quality of Life Scale as the profile tool with three subscales, including CS, BO, and STS. Data were collected using email, Short Message Service (SMS), and social networks from December 2020 to February 2021. **Results:** The mean (SD) score of CS was 38.86 (9.00), the mean (SD) score of BO was 18.60 (4.08), and STS was 34.74 (7.02). STS was substantially more prevalent among married nurses whose Polymerase Chain Reaction (PCR) tests were positive for themselves or at least one family member ($p < 0.05$). **Conclusions:** Clinical nurses who respond to the COVID-19 crisis are at risk of STS and BO. In pandemic situations like COVID-19, it is necessary to consider supportive interventions to increase satisfaction and reduce burnout and secondary traumatic stress in nurses.

Keywords: *Burnout, compassion fatigue, COVID-19, post-traumatic stress disorder, quality of life, satisfaction*

Introduction

Iran, along with China, South Korea, and Italy, was the first country where the COVID-19 pandemic spread and became one of the main areas of the virus outbreak in the Middle East and the world.[1-3] During the COVID-19 pandemic, issues such as the need for isolation and quarantine, business closures, self-quarantine, social distancing, uncertainty about the future, stigma, and social stigmatization, and the need to distance oneself from friends and family led to increased stress and anxiety among people.[4] As a result, the need for emotional and compassionate support from health professionals, including nurses, was felt more than ever. Nurses have been at the forefront of the fight against infectious diseases and COVID-19. They had a close relationship with patients and their families. Therefore, these conditions have a critical emotional and psychological impact on nurses' caring, work ethic, and emotional capacity.[5]

The ratio of nurses to beds in Iran was well below international standards before the COVID-19 pandemic. This low ratio has been one of the historical challenges of Iranian nursing in the past few decades.[6] Despite the shortage of human resources, clinical nurses have faced the challenges posed by the recent pandemic since the beginning of the crisis[7] and are a critical resource in continuing the path of pandemic control.[8] Prolonged exposure to patient suffering, particularly in times of crisis and pandemic, can lead to compassion fatigue and emotional exhaustion in nurses.[9] Helping others and providing compassionate care leads to better clinical and care outcomes for the client, but the nurse's emotional impact can be positive or negative depending on the circumstances.[10] This can negatively affect the nurse, their family, and the care they provide and reduce organizational commitment.[11-13] Stamm (2010) conceptualizes the collection of these feelings as "Quality of Work Life" (QWL), a multifaceted variable that

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indicates how employees feel about all aspects of their work. Positive outcomes of QWL include improving organizational commitment and job satisfaction, increasing practice quality, improving individual and organizational productivity, and reducing burnout and individual and organizational turnover.[11,14] Compassion and helping others can lead to "satisfaction" or in the form of negative emotions and "compassion fatigue," which itself has two parts: "burnout" and "secondary traumatic stress".[11] Burnout (BO) manifests as depression, despair, aggression, physical and mental exhaustion, and an inability to work effectively.[15] Secondary Traumatic Stress (STS) is psychological trauma caused by fear and work-related injuries.[16] When a person is constantly and secondarily exposed to high-stress events that happen to others, this is an experience of indirect stress and STS.[17]

In contrast, Compassion Satisfaction (CS) is a positive feeling of the person due to caring for or helping others in professional tasks. It makes people enjoy their job and have positive, caring outcomes [Figure 1].[18,19] Although nurses were the largest working group in hospitals, a few studies evaluated the nature of nursing work and the QWL during COVID-19. According to one of these studies, nurses' work-life satisfaction while tending to COVID-19 patients was average.[20] Another study also shows that nurses' quality of working life during COVID-19 indirectly affected burnout and directly impacted nursing professionals' resilience. In addition, the quality of work life also negatively and significantly affected emotional exhaustion and reduced personal accomplishment.[21]

The pandemic in Iran was not well controlled for various reasons, so clinical nurses were involved in the seventh wave after dealing with previous exhausting and erosive waves of the COVID-19 outbreak. Despite this unprecedented workload, the constant gratitude of the people and officials in the media for clinical nurses and medical staff, the issuance of some new concessions, and employment permits during the COVID-19 crisis can potentially improve Iranian clinical nurses' compassion satisfaction during the epidemic.

The COVID-19 pandemic could lead to a dual state of fatigue and stress on the one hand, and hope and inner satisfaction on the other, for nurses providing care for COVID-19 patients. This study aimed to investigate these hypotheses and assess professional quality of life, including compassion satisfaction, burnout, and secondary traumatic stress among frontline clinical nurses fighting COVID-19.

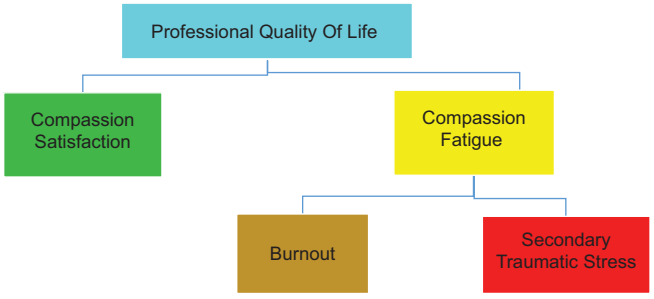

Figure 1: Conceptual research framework[11]

Materials and Methods

This research is a web-based multicenter cross-sectional study conducted from December 2020 to February 2021, in which 427 nurses worked in COVID-19 hospital wards affiliated with the Ministry of Health from all provinces of Iran. The study population was all Iranian nurses working in hospital wards caring for patients with COVID-19. According to the Ministry of Health and Medical Education, about 65% (130 thousand) of the 200 thousand Iranian clinical nurses participate in caring for COVID-19 patients.[22] The research population consisted of 130,000 clinical nurses who worked in COVID-19-dedicated hospitals or COVID-19-dedicated wards in other hospitals. Based on the result of a previous study considering a type 1 error equal to 5%, precision,[23] and S^2 equal to 25.30, the minimum sample size was calculated to be 388.

The estimated sample size was increased to 426, allowing about 10% attrition. Data collection involved the utilization of a convenient sampling approach and a web-based questionnaire. Nurses working in various kinds of government, private, social security, oil companies, and military hospitals from all provinces were included. The inclusion criteria for this study encompassed three key factors: the participant's expressed willingness to take part in the research, their current work as a nurse, and their prior experience in attending hospital wards dedicated to patients diagnosed with COVID-19. Exclusion criteria were cancellation of attendance in the study or deficiencies in completing the questionnaire.

The utilized instrument comprised two components: the occupational/demographic variables and the Persian version of the Professional Quality Of Life Scale (version 5) with three subscales: "Compassion satisfaction," "Burnout," and "Secondary traumatic stress." Stamm (2010) developed the original version with thirty items.[11] It is one of the most widely used tools in this field in different countries.[15] The translation to the Persian version, cultural adaptation, and psychometric validity were done in 2018 by Ghorji *et al*.[24] The exploratory and confirmatory factor analysis methods and test–retest and intra-cluster correlation (ICC) have confirmed its validity and reliability in the same study. Confirmatory factor analysis showed that items 1, 4, 15, 17, and 29 did not present significant factor loadings (<0.30); therefore, they were discarded. Factor loadings for other items varied from 0.32 to 0.69. The goodness-of-fit measures were as follows: Normed Fit Index (NFI): 0.93; Non-Normed Fit Index (NNFI): 0.95; Goodness of Fit Index (GFI): 0.84; Comparative Fit

Index (CFI):0.95; X2/Degrees of freedom (X2/df):2.9; and Root Mean Square Error (RMSE): ($p < 0.001$). The scale reliability related to stability was assessed using the Intra-Class Correlation Coefficient (ICC), which yielded a calculated value of 0.96. Additionally, the internal consistency of the scale was observed to be 0.73. In the current study, we calculated internal consistency using Cronbach's alpha coefficient, which was satisfactory (α =0.81).According to the scoring instruction, each of the three dimensions of the questionnaire was graded at three high, moderate, and low levels. The total score of the Professional Quality Of Life Scale is not calculated in general (as a profile instrument). Instead, it allows for the assessment of scores specifically related to the three primary subscales of the questionnaire.[24] There are three steps to scoring the ProQOL. The first step is to reverse some items (reverse items 1, 4, 15, 17, and 29 into 1r, 4r, 15r, 17r, and 29r (1 = 5) (2 = 4) (3 = 3) (4 = 2) (5 = 1)). The second step is to sum the items by subscale and the third step is to convert the raw score to a t-score.[11,24] In terms of scoring and categorization of variables, in the CS subscale, it indicated high satisfaction levels. Scores ranging from 32.6 to 45 were considered to reflect a medium level of satisfaction, while scores below 32.6 were associated with low satisfaction. In the BO subscale, the high, medium, and low levels were higher than 18.16, between 8.74 and 18.16, and lower than 8.74. Also, in the case of the ST's subscale, scores more than 32.72, between 21.52 and 32.72, and less than 32.72 were considered high, moderate, and low levels of STS, respectively. Higher scores on the compassion satisfaction sub-scale represent greater satisfaction related to the nurse's ability to be an effective caregiver in their job. Higher scores on burnout and STS sub-scales mean that nurses are more likely to be at an elevated risk of experiencing these factors.

Due to the lack of access to the research subjects, we employed an online survey and data collection technology known as EPOLL (website: https://epoll.pro) to construct the digital version of the questionnaire and provide its link to participants. This system allows the creation of a web-based questionnaire and sharing it on social networks. Therefore, the questionnaire link includes explanations about the study's objectives, solicitation of informed consent for research participation, job profile and demographic features, and the primary inquiries. The questionnaire link was sent through Telegram and WhatsApp social networking platforms and, in certain instances, by email and SMS to targeted national and local groups of nurses with specific expertise. The collected data were entered into SPSS software (version 21, IBM Corporation, Armonk, NY, USA) and analyzed using descriptive statistics (means (SD), frequency), compare mean tests (to investigate the difference between professional and demographic variables with the main study variables), and linear regression (to examine the role of independent variables in explaining the variance of the STS). Prerequisites for using regression regarding the normality of data distribution and independence of errors were assessed by Durbin–Watson (DW) and looking at the tolerance and variance inflation factor (VIF). Normal data distribution and the non-correlation of errors were recognized. Tolerance for independent variables was more than 0.9 and VIF less than 1.1, which means no collinearity among variables. Also, the Eigenvalue and Condition Index were checked, which rejected the alignment between the independent variables in the regression model for STS. The results indicated no significant violations and the necessary assumptions and defaults for using regression were passed. The STROBE checklist for cross-sectional studies was used in this study.

Ethical considerations

The study has been performed under the Declaration of Helsinki and approved by the Medical Ethics Committee of Ilam University of Medical Sciences (approval N° IR.MEDILAM.REC.1399.302). Necessary explanations about the study's objectives, maintaining anonymity, voluntary participation in the study, and leaving it were given to the subjects, and their consent was obtained to participate in the study.

Results

Four hundred and twenty-seven nurses working in COVID-19 patient care wards and hospitals were enrolled. The mean age was 58.36 (7.43), and the mean work experience was 12.26 (7.11) years. 22.50% were in the ICU or CCU, 19% were in the emergency department, and the rest were employed in other wards. Most nurses (62.30%) spent more than 10 months in COVID-19-related wards. The subject's occupational and demographic characteristics are presented in Table 1.

As Table 2 shown, the mean score of CS was 38.86 (9.00), the mean score of BO was 18.60 (4.08), and STS was 34.74 (7.02). Based on the interpretation of the scale scoring, the overall mean score of the CS, BO, and STS dimensions was at the "moderate" level, "moderate but close to the high," and "high" risk level, respectively.

The comparing means by T-test showed that the married nurses, who had positive PCR results for themselves or at least one family member, reported higher STS mean scores. Also, for the nurses with positive PCR tests, the BO mean score was higher ($p < 0.008$). The longer the service in COVID-19 wards, the greater the nurse's STS and BO risk ($p < 0.05$). On CS, nurses with stable employment status reported higher compassion satisfaction ($p < 0.01$) [Table 3].

The stepwise linear regression models show that BO and marital status variables, with BO being the main contributor,

Table 1: Characteristic variables (*n*=427)

Variable	n (%) or Mean (SD)
Age (years)*	36.58 (7.43)
≤30	87 (20.40)
30-39	189 (44.30)
40-49	129 (30.20)
≥50	22 (5.20)
Years in Nursing*	12.26 (7.11)
<5	72 (16.90)
5-9	88 (20.60)
10-14	105 (24.5)
15-19	90 (21.10)
20-24	43 (10.10)
>24	29 (6.80)
Gender**	
Male	147 (34.40)
Female	280 (65.60)
Marital status**	
Single	104 (24.40)
Married	319 (74.70)
Separated/Divorced	4 (0.90)
Nursing Education**	
Bachelor's degree	370 (86.70)
Master of Science	52 (12.10)
Ph.D.	5 (1.20)
Work setting**	
Emergency department	81 (18.90)
ICU/CCU	96 (22.50)
Other wards	250 (58.50)
Employment status**	
Stable/permanent	123 (28.08)
Temporary/unstable	304 (71.20)
Months in the COVID-19 setting**	
<5	75 (17.60)
5-10	86 (20.10)
>10	266 (62.30)
Positive PCR***test**	
Yes	129 (30.20)
No	298 (69.80)
Family member's positive PCR test**	
Yes	118 (27.60)
No	309 (72.40)

*Mean (SD). **Frequency(%). ***PCR; Real-Time Polymerase Chain Reaction

can explain a significant portion of the variance changes in STS. These variables accounted for 61.5% of the observed variance changes in STS, as shown in Table 4.

Discussion

The study aimed to investigate the professional quality-of-life dimensions of frontline nurses fighting COVID-19 in Iran. About 95% of the nurses had moderate or high-risk levels of STS. The overall level of this dimension was assessed as being at high risk. Also, the level of burnout was moderate or high in about two-thirds of nurses (68.40%). These findings are warning and thought-provoking, considering the importance of nurses' caring power to continue fighting against COVID-19 and its effects on nursing service outcomes. Also, this condition could affect some aspects of a nurse's personal life. Since the outbreak of COVID-19, some studies have shown the prevalence of psychiatric problems in frontline clinicians. For example, a cross-sectional study showed that the prevalence of depressive, anxiety, insomnia, and non-specific distress symptoms was 50.40%, 44.60%, 34.0%, and 71.50%, respectively, in frontline clinicians, including nurses. Another study found that depression was common in nurses during COVID-19, negatively affecting nurses' QOL.

With the spread of COVID-19 and the lack of a clear outlook on when it will be controlled, researchers have warned of an increased risk of burnout and post-traumatic stress disorder and emphasized its adverse effects on nursing outcomes quality.[4,25] However, the empirical evidence obtained in this area is challenging: Wu *et al*.[26] (2020) in Wuhan, China, reported a lower level of burnout among nurses and physicians working in COVID-19 settings than their counterparts in non-COVID-19 hospitals and wards. This finding is different from the present study results. The differences in the professional and socio-cultural context of the two studies can justify the difference in the results. For example, the lack of nurses in Iran was an old issue that intensified during the pandemic, which could have increased the impact of the pandemic on the studied variables.

In contrast, consistent with the results of this study, Ruiz-Fernández *et al*.[27] (2020) found higher levels of burnout and fatigue due to Spanish nurses' compassion care in COVID-19 wards than their compatriots in other hospital wards. Also, the Arpacioglu *et al.* (2021)[28] study showed that the secondary traumatization scores of the frontline healthcare workers for COVID-19 were significantly higher than those of the other health workers or non-medical workers. Also, they found that living with a parent, having a chronic disease, having a trauma history, and increased social media use were related to having higher scores on the secondary traumatization scale.

The "duration of exposure" should be considered in interpreting the results for STS and BO levels. Prolongation and recurrence of stressful events are among the leading causes of burnout and fatigue.[9,29] Iran is one of the countries whose healthcare staff has struggled with seven waves of the disease since February 2020 and prolonged exposure to this critical situation, unlike China, where the disease was primarily controlled in the early stages. The data of the mentioned study were collected only about 3 months after the beginning of the crisis; therefore, the

Table 2: Means, standard deviation of compassion satisfaction, burnout, and secondary traumatic stress (*n*=427)

Variable			Mean (SD)/*n* (%)	Interpretation
Compassion satisfaction*	Mean (SD)		38.86 (9.00)	Moderate level
	n (%)	Low	90 (21.10)	
		Moderate	225 (52.70)	
		High	112 (26.20)	
Burnout**	Mean (SD)		18.60 (4.08)	Moderate risk
	n (%)	Low	7 (1.60)	
		Moderate	157 (36.80)	
		High	263 (31.60)	
Secondary traumatic stress**	Mean (SD)		34.74 (7.02)	High risk
	n (%)	Low	20 (4.70)	
		Moderate	130 (30.40)	
		High	227 (64.90)	

*Higher scores mean a higher level of Compassion satisfaction and range from 32/6 to 45. **For burnout and secondary traumatic stress, scores range from 8/74-18.16 and 21/52-32/72, respectively

Table 3: *t*-Test analysis for professional quality-of-life subscales

Grouping variable	Test variables	Mean (SD)	*t*	*p*
Positive PCR **	STS*		3.09	0.002
Yes		36.19 (5.86)		
No		34.12 (7.39)		
Employment **	CS*		-3.02	0.003
Stable		40.91 (11.28)		
Unstable		38.03 (7.77)		
Family member Positive PCR**	BO*		2.03	0.043
Yes		19.25 (4.20)		
No		18.35 (4.01)		
Family member** Positive PCR	STS*		2.97	0.003
Yes		36.36 (6.97)		
No		34.12 (6.95)		

*CS; compassionate satisfaction, BO; burnout, STS; secondary traumatic stress, M; Mean, SD; Standard Deviation. **Significant

Table 4: Stepwise multiple linear regression for secondary traumatic stress

	B	Error t.	*B*	*t*	*p*	R^2 change
Constant						
Burnout	1.30	0.052	0.76	25.20	<0.001	0.60
Marital status	2.17	0.48	0.14	4.56	<0.001	0.02

Note; Adjusted R^2: 0.615, Durbin–Watson; 1.783. Numbers are rounded to two decimal places

low-risk level of STS and BO reported by Wu *et al*. can be justified by less time responding to the crisis and different data collection times.

Comparing the results with studies conducted in Iran before the outbreak of COVID-19 shows some differences: Ariapooran (2014) reported 15.03 percent burnout among the nurses working in public hospitals in Malayer, Iran.[29] In their meta-analysis study, Rezaei *et al*.[30] (2018) estimated that Iranian nurses' burnout prevalence is as high as 36%. In the present study, we found that about two-thirds of nurses (68.40%) were at moderate or high risk of burnout. Therefore, due to the creation of a unique and unprecedented situation, the recent pandemic led to further exacerbations of STS. One reason could be the fear of contracting or transmitting the disease to oneself and family members. The STS higher mean score and risk in nurses who had COVID-19 themselves or a family member, as well as in married nurses in our study, can be explained from this perspective. This fear is not unrealistic: a cohort study with a high participation population in the United States and the United Kingdom (2020) showed that the risk of infection by COVID-19 in the medical staff is 3.4 times higher than in the general population.[31] Ruiz-Fernández *et al*. (2020) also concluded that the levels of compassion fatigue (CF) and burnout (BO) were elevated during COVID-19, and the predicting factors for the occurrence of CF were being married, working in primary care in urban areas, and working a morning, evening, or nightshift. Only the work shift had an impact on BO.[27]

The CS mean score of studied nurses was 38.86 (9.00) at the "moderate" level. Despite the quantitative and qualitative expansion of university nursing education in Iran, one of this profession's historical and chronic challenges has been the lack of appropriate social attention and support.[6] During the recent pandemic, the actual position of the profession was recognized by the people, officials, and media.[32] Also, new financial and organizational incentives such as increasing the number of government employers of nurses and positive motivation resulting from patients' recovery are among the things that can be considered in interpreting the relative satisfaction of Iranian nurses. Along with these results, in the study of Ruiz-Fernández *et al*.[27] (2020) in Spain, improving society's social image and general attitude toward nurses and promoting their status as national heroes were expressed as the main factors in nurses' satisfaction

during the recent pandemic. In contrast, in the study of Trumello (2020), no differences were detected between professionals working or not with COVID-19 patients regarding compassion satisfaction, whereas it was significantly lower in professionals working in the Italian regions most affected by the current pandemic. The basis of compassion satisfaction is constituted of an empathetic relationship with the patient's family and support from colleagues, and it seems that all these aspects were compromised by working in the Italian regions most affected by the COVID-19 pandemic.

One of the limitations of our study was sampling. As mentioned in the method, we try to select a random sample from all nurses using web-based sampling. However, since it was not possible to access the sampling frames, the selected sample may not be completely representative, and caution should be taken when generalizing the results. The regression analysis results in the present study showed that various factors outside the study variables are involved in predicting and explaining CS. Furthermore, research with different methodologies and qualitative and in-depth interviews is recommended to determine other possible variables and social, organizational, and personality factors affecting CS in frontline nurses fighting COVID-19.

Conclusion

The current study highlighted a significant prevalence of secondary traumatic stress, a substantially elevated burnout risk, and a modest compassion satisfaction level among frontline nurses in Iran who have been exposed to COVID-19. The variables examined in this study exhibited little efficacy in predicting CS. However, it is essential to identify influential social and organizational elements to enhance satisfaction. Additionally, it is crucial to implement appropriate strategies to improve nurses' working circumstances and mitigate stress and burnout.

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Conflicts of interest

Nothing to declare.

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