



ORIGINAL ARTICLE

Professional quality of life in nurses on the frontline against COVID-19

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Abstract

Aims: This study aimed to investigate professional quality of life (ProQOL) in nurses who were fighting against COVID-19 in Wuhan and its related factors.

Background: COVID-19 epidemic is a major threat to public health. Frontline nurses have engaged in infection prevention and control, isolation, containment and public health. However, available data on ProQOL in these nurses are limited.

Methods: From 15 to 21 March 2020, the Chinese version of ProQOL was utilized to survey a total of 102 nurses through an electronic questionnaire. The stepwise regression analysis was performed to determine which factors (e.g. demographic and work-related factors) were related to ProQOL.

Results: The scores of compassion satisfaction (CS), burnout (BO) and secondary traumatic stress (STS) were 38.09 ± 5.22 , 21.77 ± 4.92 and 20.75 ± 6.27 , respectively. The STS and CS scores were higher than the critical value. None of the nurses reported a low level of CS or a high level of BO and STS. Nurses' ProQOL was related to working hours, workload, job satisfaction and salary satisfaction.

Conclusions: Nurses who were fighting against COVID-19 had better CS and BO, whereas STS was relatively worse. Nurses who worked for long hours had more severe STS. BO of nurses with heavy workload and dissatisfaction with their salary was more severe. Nurses who were unsatisfied with their job had poor CS.

Implications for Nursing Management: It is believed that these results may help nurse managers to improve ProQOL of nurses who were fighting against COVID-19 by minimizing working hours, reducing workload and improving job satisfaction and rewards.

KEYWORDS

compassion satisfaction, burnout, secondary traumatic stress, COVID-19, nurse, ProQOL

1 | INTRODUCTION

In November 2019, a novel type of coronavirus disease (COVID-19) was first reported in Wuhan, Hubei Province, China, and subsequently spread across the world (Chan et al., 2020). Globally, until 21 September 2021, there have been 228,807,631 confirmed cases of COVID-19, including 4,697,099 deaths, according to the data of WHO (WHO, 2021). In order to prevent spread of the disease and to replenish the medical and nursing workforce in Wuhan, medical professionals from a variety of hospitals in China were recruited to Wuhan to manage more than 40,000 infected patients in the city (Han et al., 2020; WHO, 2020). In China, as of March 1, a total of 28,679 nurses had been recruited to Hubei Province to fight against COVID-19 (Mo et al., 2020), accounting for 68% of all frontline medical workforce.

Nurses engaged in infection prevention and control, isolation, containment and public health (Graeme, 2020). Moreover, they were at a high risk of infection during patient care (Dai et al., 2020). The National Health Commission of the People's Republic of China reported that as of midnight on 11 February 2020, a total of 1716 Chinese health workers were infected with COVID-19, of whom 1502 (87.5%) were from Hubei Province, especially 1102 health workers from Wuhan (Hou, 2020). A report in September 2020 showed that, in 44 countries with available data, more than 1000 nurses were infected and died of COVID-19 (International Council of Nurses, 2020). Meanwhile, nurses who fight against COVID-19 generally suffered stress (Mo et al., 2020). The nurses' mental workload increased during COVID-19 pandemic (Sima & Hassan, 2021). When nurses work with a high risk of infection, high pressure, multiple tasks, lack of resources and increased physical and psychological burden, the physical and mental health of nurses may be adversely affected (Vizheh et al., 2020). Correspondingly, their professional quality of life (ProQOL) may be negatively affected, which is a huge challenge for nursing management.

ProQOL is defined as an emotional perception of each individual from his/her own work, including compassion satisfaction (CS) and compassion fatigue (CF) (Stamm, 2010). CS is a pleasure derived from working, which drives nurses to care for patients (Stamm, 2016). CF is an emotional distress that can be experienced by caregivers who have ongoing contact with patients distressed or traumatized, which seriously affects helpers' physical and mental health and reduces their interest of empathizing with others, thereby impairing their willingness to help others (Figley, 2002). CF covers burnout (BO) and secondary traumatic stress (STS) (Stamm, 2010). STS refers to a set of psychological symptoms that mimic post-traumatic stress disorder, but are acquired through exposure to stress of trauma. BO is a negative emotional reaction to one's job that results from prolonged exposure to a stressful work environment. Zhang et al. (2018) published a meta-analysis, which showed that age, educational levels, gender, service duration, meaningful recognition, work experience, job careers, job satisfaction and time of contact with clients were significantly associated with CS, CF or BO.

Clinical nurses are a high-risk group for ProQOL (Hegney et al., 2014). Although the professional experience of helping others

promotes CS, caregivers experience distress due to a frequent contact with patients during long-term professional engagements, leading to CF and BO if the occupational stress is directly related to the dissonance between job demands (Weintraub et al., 2016). CF is a phenomenon that affects healthcare providers across disciplines and is associated with psychological disruptions, emotional exhaustion, impaired interpersonal function and physiological problems (Kelly et al., 2015; Ledoux, 2015; Tian et al., 2017). Sinclair et al. (2017) found that cumulative stress related to work may impair health of healthcare providers, influence the quality of health care services and increase the difficulty of management. Physical and mental health of nursing staffs is extremely important for controlling infectious diseases (Xiang et al., 2020). Their work and life are the main challenges for nursing managers at present. Currently, there are very few reports about nurses' ProQOL during the COVID-19 pandemic and its related factors. Therefore, under this global crisis, it is necessary to explore nurses' ProQOL, which may facilitate pre-deployment training, workforce deployment and intervention measures during upcoming emergencies.

2 | METHODS

2.1 | Design

A cross-sectional research design was used in this study.

2.2 | Participants and sampling

From 15 to 21 March 2020, the frontline nurses at Wuhan Taikang Tongji Hospital, Huoshenshan Hospital, and People's Hospital of Wuhan University (Wuhan, China) were surveyed by convenience sampling. Inclusion criteria: (1) voluntary participation in the study, (2) nurses on the frontline against COVID-19 and (3) certified nurse practitioners. Exclusion criteria: non-frontline nurses who engaged in nursing management, teaching and scientific research.

The sample size was at least 5–10 times the number of variables (Ni et al., 2019). The current study included 16 variables, and 90–160 cases were included. A total of 108 questionnaires were collected. After excluding the questionnaires that did not meet the requirements, 102 questionnaires (94.4%) were included for the final analysis.

2.3 | Measurement instruments

The demographic characteristics included a nurse's marital status, work experience (years), educational levels, infection status (i.e. COVID-19) of a nurse's family or friends, working hours at Wuhan, a nurse's working hours per day during the pandemic, the number of night shifts per week, workload, job satisfaction, pay satisfaction, etc.

Chinese version of the Compassion Fatigue Scale (ProQOL) was developed by Stamm (2010) and translated by Chinese scholars in 2013 (Chen & Wang, 2013). The scale includes three dimensions and

30 items, which is 5-point Likert scale, and a higher score indicates a higher frequency. CS indicates a positive effect on nurses, where the critical value is less than 37 points, whereas both BO and STS indicate negative effects. For BO, the critical value is greater than 27 points, which is higher than 17 points for STS (Chen & Wang, 2013). The score range for each dimension was 10–50, 10–22, 23–41 and 42–50, respectively, and higher scores indicated a higher level of fatigue or satisfaction (Stamm, 2010). The total Cronbach's α coefficient of the Chinese version of the scale is 0.91, and the Cronbach's α coefficients of the three dimensions are 0.87, 0.73 and 0.84, respectively (Chen & Wang, 2013).

2.4 | Ethics approval and data collection

The study was approved by the Ethics Committee of General Hospital of Xinjiang Military Region. Due to the requirements for epidemic control, the questionnaires were converted into an electronic version, the Questionnaire Star platform based on WeChat was used, and data were collected via scanning QR code on mobile phone. The leaders of each batch of nurses from Xinjiang who were fighting against COVID-19 were called to explain the purpose of our study and invited to promote the research. With the support of the nurse leaders from three hospitals, the questionnaires were distributed to nurses meeting the inclusion criteria through WeChat. The respondents just scanned the QR code to complete the questionnaire. Standardized instructions were given, and important questions were labeled as mandatory to ensure that there was no missing in the questionnaire. Surveys were conducted anonymously, and completion and submission of the questionnaire by a participant were deemed as consent. To avoid the situation that the same participant completed multiple questionnaires, the account, device and IP address were used for submission once only. It took about 10–15 min to complete the questionnaire. Participants whose response time was less than 3 min or more than 30 min were excluded.

2.5 | Data analysis

SPSS 21.0 software (IBM Corp., Armonk, NY, USA) was used to analyse the data. Measurement data were presented as mean \pm standard deviation (SD), and count data were expressed as frequency/percentage. The independent-samples *t*-test, one-way analysis of variance (ANOVA) and stepwise regression were used to analyse related factors of nurses' ProQOL.

3 | RESULTS

3.1 | Demographic characteristics

Among 102 nurses, 89.2% were women, and 56.9% were aged 30–40 years old. Besides, 78.4% were married, and 69.6% were of undergraduate level or above. Moreover, 62.6% were junior nurses, 58.8%

had working experience of more than 10 years, and 59.8% nurses were employed. 43.2% of nurses worked at department of internal medicine. Furthermore, 64.7% had been working in Wuhan for less than 1 month, 83.3% worked for less than 8 h per day as clinical front-line staffs, and 61.8% had ≥ 3 night shifts per week. In addition, 65.7% felt that the work burden was acceptable, and 24.5% of nurses had no siblings. 70.6% were satisfied with the current job, and 71.6% were satisfied with benefits and salary of the current job. Detailed demographic characteristics of the nurses are listed in Table 1.

3.2 | ProQOL in nurses

Among 102 nurses, the scores of CS, BO and STS were 38.09 ± 5.22 (range, 24–50), 21.77 ± 4.92 (range, 14–35) and 20.75 ± 6.27 (range, 11–37), respectively. The STS and CS scores were higher than the critical value. The BO score was lower than the critical value. Nurses reported moderate (64.7%) to high (35.3%) levels of CS, low (66.7%) to moderate (33.3%) levels of BO and low (76.5%) to moderate (23.5%) levels of STS. Details are shown in Table 2.

3.3 | Factors related to nurses' ProQOL

Using general data as independent variables and BO, STS and CS as dependent variables, univariate analysis was performed, and the results showed that nurses' age, working hours per day, workload and salary satisfaction were related to secondary traumatic stress; salary satisfaction, job satisfaction and workload were related to BO and CS ($P < .05$; Table 3). The significant variables revealed by univariate analysis were taken as independent variables, and stepwise regression analysis was performed. It was found that working hours per day ($\beta = .261$, $P = .007$), workload ($\beta = -.428$, $P = .000$; $\beta = -.376$, $P = .000$; $\beta = .277$, $P = .008$), salary satisfaction ($\beta = .311$, $P = .001$) and job satisfaction ($\beta = -.335$, $P = .001$) were related to ProQOL (Table 4). Specifically, the results revealed that nurses who worked for long hours per day, had heavy workload and were unsatisfied with their work and salary had poor ProQOL.

4 | DISCUSSION

In the present study, the results of CS and BO were better than those in China, Spain, Korea, Saudi Arabia, Egypt and Portugal nurses in recent studies before the pandemic (Cruz et al., 2020; Duarte & Pinto-Gouveia, 2020; Monroe et al., 2020; Pang, Dan, et al., 2020; Ruiz-Fernández et al., 2020; Tian et al., 2018), but consistent with the results in other countries under a serious COVID 19 crisis, such as Spain and Italy (Buselli et al., 2020; Ruiz-Fernández et al., 2021), indicating that CS and BO of China's nurses who cared for patients with COVID-19 were relatively good. This interesting result was contrary to our expectations, which may be related to the following reasons. Firstly, it has been shown that clinical nurses had moderate or severe

TABLE 1 Demographic and work-related characteristics of nurses ($n = 102$)

Variable	n (%)	Variable	n (%)
Gender		Identity	
Male	11 (10.8)	Soldier	25 (24.5)
Female	91 (89.2)	Military civilian	16 (15.7)
Age (years)		Hiring personnel	61 (59.8)
≤30	30 (29.4)	Department of the original unit	
30–40	58 (56.9)	Internal medicine	44 (43.2)
≥41	14 (13.7)	Surgical	29 (28.4)
Marital status		Emergency department	7 (6.9)
Single	20 (19.6)	ICU	12 (11.8)
Married	80 (78.4)	Operating room	5 (4.9)
Other	2 (2.0)	Other	5 (4.9)
Only child (Y/N)		Whether nurses' relatives or friends were infected with COVID-19	
Yes	25 (24.5)	Yes	3 (2.9)
No	77 (75.5)	No	99 (97.1)
Number of children		Working hours per day(h)	
0	30 (29.4)	<8	85 (83.3)
1	55 (53.9)	8–12	12 (11.8)
2	17 (16.6)	≥12	5 (4.9)
Educational level		Number of night shifts per week	
Junior college	31 (30.4)	0	5 (4.9)
Undergraduate	62 (60.8)	1	4 (3.9)
Postgraduate	9 (8.8)	2	30 (29.4)
Professional title		≥3	63 (61.8)
Junior	59 (62.6)	Whether the workload is very heavy	
Intermediate	36 (34.1)	Yes	30 (29.4)
Senior	7 (3.3)	General	67 (65.7)
Work experience (years)		No	5 (4.9)
1–5	9 (8.8)	Job satisfaction	
6–10	33 (32.4)	Very satisfied	15 (14.7)
≥11	60 (58.8)	Satisfaction	57 (55.9)
Duration of working at Wuhan (months)		General	26 (25.5)
<1	66 (64.7)	Not satisfied	4 (3.9)
≥1	36 (35.3)	Salary satisfaction	
		Very satisfied	17 (16.7)
		Satisfaction	56 (54.9)
		General	25 (24.5)
		Not satisfied	4 (3.9)

sense of responsibility during the pandemic (Yu & Liu, 2020), and nurses with strong professional duty and responsibility exhibited higher levels of CS (Litao, 2019). Other authors state that, the satisfaction derived from helping others is very pronounced and could act as a protector against CF and BO (Cummings et al., 2018). Secondly, studies before the pandemic showed that continuous contact of healthcare professionals with patients can increase CF and CS (Craigie et al., 2016; Ruiz-Fernández et al., 2020). In the current survey, 68.1% of the respondents

had worked on the frontline against the epidemic for less than one month, and they were hence less affected by COVID-19. Finally, Chinese government, various sectors in society and families have provided support, assistance, and praise to nurses fighting against COVID-19 by different ways. It has been reported that acknowledgement and support for nurses' work can increase the sense of personal accomplishment and professional identity, mitigate CF, and improve CS (Kelly & Lefton, 2017; Fu et al., 2018; Luan et al., 2020).

TABLE 2 Prevalence and severity of ProQOL ($n = 102$)

Dimension	<i>n</i>	Prevalence (%)
Compassion satisfaction (<37)	39	38.2
Burnout(>27)	20	19.6
Secondary traumatic stress (>17)	71	69.6
Compassion satisfaction		
Low	0	0
Moderate	66	64.7
High	36	35.3
Burnout		
Low	68	66.7
Moderate	34	33.3
High	0	0
Secondary traumatic stress		
Low	78	76.5
Moderate	26	23.5
High	0	0

Abbreviation: ProQOL, professional quality of life.

However, COVID-19 is a Class B infectious disease that is highly contagious, which spreads quickly, with a noticeable mortality rate. Concerning a public health crisis, reactions, such as helplessness, fear and anxiety, may arise in individuals and groups (Zhang et al., 2014); thus, nurses who are on the frontline against the epidemic may suffer great stress. The current study indicated that STS scores were higher than the critical value and also higher than those of Turkey's nurses before the pandemic and Italy's nurses during the pandemic (Buselli et al., 2020; Erkorkmaz et al., 2018). The symptoms of STS may include insomnia, intrusive thinking and anxiety (Flarity et al., 2013). Patients with COVID-19 are prone to suffer mood swings, anger and sadness (Zhou et al., 2020). Nurses who are in contact with such patients may experience a remarkable psychological pressure. It has been found that anxiety and somatization symptoms of nurses on the frontline against the pandemic are more prominent (Jiang & Tan, 2020). Therefore, it is necessary to care more about nurses' STS, provide psychological counselling and social support, maintain a positive team culture and take appropriate exercises to reduce the negative effects of the pandemic on nurses.

Our findings suggest that the longer the clinical frontline working hours of nurses, the more severe STS. Yoder (2010) noted that the incidence of CF was lower in nurses who worked for less than 8 h per day compared with those who worked for less than 10 h. It has been reported that when nurses work in an unfavourable working environment, their CF symptoms are more severe (Kelbiso et al., 2017), and longer exposure of nurses to infection is associated with greater physical and mental challenges (Jiang & Tan, 2020). When working hours are long, there is no sufficient time for nurses to manage and dispel any negative emotions. They cannot resolve the negative emotions that arise from traumatic events, thereby resulting in secondary traumatic stress (Tian et al., 2017). Managers should consider the working hours of nurses on the frontline against the epidemic, and reasonable

working schedules are recommended to improve work efficiency and relieve STS.

In this study, nurses with a heavy workload had more remarkable BO and STS and relatively lower CS levels. Some studies found that nurses with heavy workload tended to develop STS, reducing their job satisfaction and BO, consistent with our study (Crowe, 2016; Tian et al., 2017). Workload of a nurse refers to the total amount of work that he/she has to complete during working hours (Pang, Fang, et al., 2020). In China, a nurse's work mainly includes operations, life care, answering questions, clinical guidance, disease control, admission orientation, discharge guidance, etc. (Zhang & Ye, 2016). Work overload may not only affect nursing quality and work efficiency but also bring nurses anxiety, depression and other negative moods (Carvalho et al., 2019). At the same time, a heavy job may well cause BO of nurses (Pan et al., 2018), which may further bring nurses a series of physiological symptoms (Khamisa et al., 2015). If there is work overload every day and rest cannot be guaranteed, nurses cannot resolve and ease the negative emotions that arise from traumatic events, and the psychological load may continuously increase. For nurse managers, it is recommended to assess the workforce required at each time point based on a flexible schedule so that when the workload is increasing sharply, human resources are deployed promptly to alleviate work overload and avoid potential safety hazards.

The current study showed that 73.6% of nurses were satisfied with their job salary and 72.5% were satisfied with their current job. Nurses who were satisfied with their salary experienced less BO, and those with high job satisfaction had higher levels of CS and less CF. Jordan et al. (2013) found that the incidence of CF among high-income nurses was low. Tian et al. (2018) showed that nurses with poor levels of salary satisfaction experienced increased BO. Gong et al. (2019) reported that nurses with poor job satisfaction were more likely to experience CF, which is similar to our finding. Job satisfaction is determined by the match between staff's expectations and remuneration provided by a job and wages and benefits play a vital role in job satisfaction. Wages can increase professional identity in nurses (Tian et al., 2017) and personal accomplishment (Liang et al., 2019) and improve work enthusiasm, thereby increasing job satisfaction (Liang et al., 2019) and CS (Hooper et al., 2010) and reducing BO in nurses (Cowin et al., 2008). In addition to improvement of the wages and benefits for nurses on the frontline against COVID-19, the managers are also advised regularly surveying job satisfaction of nurses, promptly solving the problems of such nurses, supporting their work and creating a culture centred on motivation to increase their work satisfaction and avoid CF.

5 | LIMITATIONS

There are also some limitations in the study. Firstly, this study only investigated the nurses from Xinjiang who were fighting against COVID-19 in Wuhan, and nurses from other provinces were not covered. Secondly, this was a cross-sectional study, and changes in ProQOL over time were not analysed. Thirdly, we only conducted a

TABLE 3 Univariate analysis of ProQOL of nurses (independent-samples t-test or one-way ANOVA, $\bar{x} \pm s$)

Variable	Compassion satisfaction	Burnout	Secondary traumatic stress
Gender			
Male	37.38 ± 8.15	22.25 ± 4.26	19.38 ± 4.06
Female	38.93 ± 6.03	21.40 ± 4.99	20.12 ± 5.94
T	.674	.466	.346
P	.502	.642	.730
Age (years)			
≤30	38.88 ± 6.53	20.54 ± 4.41	18.46 ± 4.23
30–40	39.16 ± 6.23	21.29 ± 4.99	19.91 ± 5.57
≥41	36.22 ± 5.06	25.11 ± 4.54	25.22 ± 8.15
F	.870	3.070	4.910
P	.423	.051	.010
Marital status			
Single	40.00 ± 5.17	20.24 ± 3.75	19.59 ± 4.41
Married	38.63 ± 6.23	21.74 ± 5.08	20.17 ± 6.15
Other	34.50 ± 14.84	22.50 ± 9.19	20.00 ± 2.82
F	.823	.681	.067
P	.443	.509	.935
Only child (Y/N)			
Yes	39.45 ± 5.80	19.95 ± 3.83	20.45 ± 3.87
No	38.58 ± 6.35	21.96 ± 5.14	19.93 ± 6.29
T	.573	1.680	.370
P	.568	.096	.712
Number of children			
0	38.32 ± 5.59	20.54 ± 4.19	18.50 ± 4.56
1	38.91 ± 6.56	21.64 ± 5.12	20.55 ± 5.86
2	39.25 ± 6.48	22.63 ± 5.43	21.31 ± 7.14
F	.131	0.974	1.583
P	.878	0.381	.211
Educational level			
Junior college	37.58 ± 6.81	21.58 ± 5.62	20.10 ± 5.98
Undergraduate	39.61 ± 5.58	21.29 ± 4.33	19.80 ± 5.50
Postgraduate	36.75 ± 9.35	23.25 ± 7.63	23.25 ± 8.73
F	1.298	.305	.658
P	.278	.738	.520
Professional title			
Junior	38.82 ± 6.38	21.30 ± 4.94	19.93 ± 5.44
Intermediate	38.06 ± 5.69	22.19 ± 4.90	20.48 ± 6.66
Senior	45.67 ± 5.13	17.33 ± 2.88	18.00 ± 1.00
F	2.103	1.447	.283
P	.128	.241	.754
Work experience (years)			
1–5	37.33 ± 5.89	19.44 ± 3.94	16.56 ± 3.24
6–10	38.04 ± 6.40	22.43 ± 4.95	20.96 ± 5.48
≥11	39.43 ± 6.18	21.31 ± 4.99	20.17 ± 6.11
F	.733	1.333	2.047
P	.483	.269	.135

(Continues)

TABLE 3 (Continued)

Variable	Compassion satisfaction	Burnout	Secondary traumatic stress
Identity			
Soldier	38.11 ± 6.09	22.63 ± 5.07	21.79 ± 6.49
Military civilian	41.07 ± 7.81	19.21 ± 4.85	17.50 ± 5.17
Hiring personnel	38.47 ± 5.80	21.64 ± 4.78	20.10 ± 5.55
<i>F</i>	1.144	2.088	2.283
<i>P</i>	.323	.130	.108
Department of the original unit			
Internal medicine	39.30 ± 5.34	20.98 ± 4.70	19.88 ± 6.57
Surgical	39.12 ± 5.68	21.16 ± 4.67	20.24 ± 5.29
Emergency department	36.50 ± 8.66	24.50 ± 6.35	22.50 ± 5.74
ICU	35.00 ± 7.18	23.83 ± 4.13	20.00 ± 4.22
Operating room	43.00 ± 7.51	18.20 ± 5.54	17.40 ± 4.15
Other	39.80 ± 8.04	22.20 ± 6.72	21.40 ± 7.43
<i>F</i>	1.610	1.461	.406
<i>P</i>	.166	.211	.843
Whether nurses' relatives or friends were infected with COVID-19			
Yes	35.50 ± 10.60	24.00 ± 8.48	25.00 ± 7.07
No	38.87 ± 6.15	21.42 ± 4.87	19.94 ± 5.75
<i>T</i>	.756	.733	1.225
<i>P</i>	.451	.465	.224
Duration of working at Wuhan (months)			
≤1	38.11 ± 6.36	21.74 ± 5.03	19.82 ± 5.83
>1	40.24 ± 5.69	20.89 ± 4.69	20.55 ± 5.75
<i>T</i>	1.599	.782	.561
<i>P</i>	.115	.437	.577
Working hours per day(h)			
≤8	38.91 ± 6.29	21.30 ± 4.83	19.54 ± 5.43
8–12	38.38 ± 6.16	21.50 ± 5.23	22.25 ± 6.08
≥12	35.50 ± 2.12	28.50 ± 3.53	32.00 ± 7.07
<i>F</i>	.310	2.150	5.688
<i>P</i>	.734	.123	.005
Number of night shifts per week			
0	38.20 ± 7.98	22.00 ± 5.70	22.40 ± 4.39
2	40.56 ± 6.25	20.78 ± 5.27	20.59 ± 5.54
≥3	38.03 ± 5.98	21.75 ± 4.73	19.61 ± 6.00
<i>F</i>	1.572	.384	.696
<i>P</i>	.213	.682	.501
Whether the workload is very heavy			
Yes	34.43 ± 5.42	25.87 ± 4.19	24.57 ± 5.95
General	40.00 ± 5.54	20.06 ± 4.15	18.54 ± 4.96
No	43.60 ± 8.20	19.00 ± 5.47	18.40 ± 4.50
<i>F</i>	10.034	16.778	11.536
<i>P</i>	.000	.000	.000
Job satisfaction			
Very satisfied	45.75 ± 4.51	17.92 ± 3.57	18.92 ± 4.03
Satisfaction	38.54 ± 5.19	21.19 ± 4.14	19.74 ± 5.32

(Continues)

TABLE 3 (Continued)

Variable	Compassion satisfaction	Burnout	Secondary traumatic stress
General	36.57 ± 6.33	23.39 ± 5.96	20.74 ± 7.16
Not satisfied	29.50 ± 7.77	28.50 ± 0.70	27.50 ± 7.77
F	9.725	5.367	1.439
P	.000	.002	.237
Salary satisfaction			
Very satisfied	43.29 ± 7.02	19.29 ± 3.83	19.36 ± 3.41
Satisfaction	39.02 ± 5.00	20.43 ± 4.13	18.87 ± 5.38
General	35.77 ± 6.11	25.14 ± 5.39	23.14 ± 7.08
Not satisfied	34.50 ± 14.84	24.00 ± 7.07	22.50 ± 0.70
F	5.146	7.193	3.233
P	.003	.000	.026

Abbreviation: ProQOL, professional quality of life.

TABLE 4 Factors influencing ProQOL

Dimension	Variable	Unstandardized coefficients		Standardized coefficients	R ²	Cumulative R ²	t	P
		B	SE*	β				
Compassion satisfaction	Constant	39.536	3.631		.272	.255	10.889	.000
	Job satisfaction	-3.096	.940	-.335			-3.293	.001
	Workload	3.306	1.211	.277			2.730	.008
Burnout	Constant	24.000	2.267		.335	.320	10.585	.000
	Workload	-4.039	.838	-.428			-4.821	.000
	Salary satisfaction	2.229	.636	.311			3.505	.001
Secondary traumatic stress	Constant	19.545	3.710		.237	.220	5.269	.000
	Workload	-4.178	1.044	-.376			-4.000	.000
	Working hours per day	3.771	1.360	.261			2.773	.007

Abbreviations: ProQOL, professional quality of life; SE*, standard error.

questionnaire survey, and there was no intervention. Finally, in addition to the factors concerned in this study, there may be other potential factors related to nurses' ProQOL. However, the above-mentioned shortcomings may be resolved in future studies.

6 | CONCLUSION

Although nurses reported high levels of CS with their work, there was also a high prevalence of STS. Thus, the positive feelings of CS were not enough to counteract the negative emotions arising from STS. Managers should monitor ProQOL of nurses on the frontline against COVID-19, especially STS. It was also found that nurses who worked for long hours had more severe STS. BO of nurses who had heavy workload and were unsatisfied with their salary was more severe, and nurses who were unsatisfied with their job had poor CS. However, individual and environmental factors associated with ProQOL remain to be further investigated, and it is expected to facilitate making of preventive, training and support policies.

7 | IMPLICATIONS FOR NURSING MANAGEMENT

Given that COVID-19 pandemic is still an ongoing crisis and the emergence of similar crises is possible, there may be several implications for policymakers and nursing managers. Before fighting against the epidemic, it is necessary to train nurses, such as training of personal resilience, learning more about epidemic prevention and control and knowing more about COVID-19 patients. During the epidemic, some intervention strategies may be considered, such as knowledge training, emotion management training, psychological counselling, maintaining a positive team culture, increasing social support and taking appropriate exercises. Furthermore, it is recommended that nursing managers reasonably arrange the work schedule of nurses, which can reduce nurses' working hours and workload accordingly. Financial subsidies and rewards from the managers are advised to increase work satisfaction and avoid CF. Finally, it may be a good opportunity for nurse managers to develop a culture of care and increase social position of nursing.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

ETHICAL APPROVAL

The study was approved by the Ethics Committee of General Hospital of Xinjiang Military Region.

DATA AVAILABILITY STATEMENT

Authors do not wish to share the data.

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