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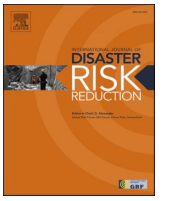

Mental health status of medical staff in Xinjiang Province of China based on the normalisation of COVID-19 epidemic prevention and control

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ABSTRACT

Introduction: The 2019 coronavirus disease (COVID-19) pandemic has burdened and threatened the psychological health of people around the world, especially those of front-line medical staff. This study aimed to explore the mental-health status and its associated factors amongst the medical workforce of Xinjiang province under the normalisation of the COVID-19 epidemic prevention and control.

Methods: A total of 408 medical staff were recruited from February 20 to March 10, 2021. Symptom Checklist 90 (SCL-90) scale, Social support Scale, and Simplified Coping-Style Questionnaire were applied to assess their mental-health status and stress-coping tendency. Descriptive analyses, welch's T-test, chi-square test, and binary logistic regression were used to analyse the data.

Results: The prevalence of mental-health problems was 20.25% (80/395) amongst the surveyed medical staff, and their total symptom mean score (1.31 ± 0.40) was lower than that of the general population (1.44 ± 0.43). Logistic regression analysis revealed that nurse, individual with poor health condition, those who lived with their elderly parents at home, those receiving less social support, and those with a negative stress-coping style were more likely to show psychological problems.

Conclusion: More attention should be paid to the mental state of the medical workforce during the COVID-19 pandemic. The government and professional institutes should facilitate social supportive activities and essential counselling services to help strengthen the psychological resilience of medical staff. Additionally, it is necessary for health administration committee and hospitals to make COVID-19 prevention practice guides and risk communication principles for improving the mental health of the front-line medical staff.

1. Introduction

The coronavirus disease (COVID-19) pandemic has drawn global attention owing to the causative virus's fast transmission speed, high contagion, and lack of effective treatment and preventive methods amongst populations worldwide [1,2]. No country can be

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completely immune to the threat. Considerable efforts have been made to suppress this pandemic, but until now, the fact that Omicron virus is mutating to the "Hotchpotch of Mutations" [3], it stroke a whole new wave of uncertainty, undoubtedly, it remains a major public health issue of global concern.

Overall, the COVID-19 epidemic prevention and control has paced towards a positive direction and currently remains under control in China [4]. Considering that prompted dramatic government reactions were taken to contain the virus outbreak, such as early reporting, large-scale suspicion of infection monitoring, movement-control order, and rigorous vaccination campaign, the general public's sense of security and protection awareness has been improved [5]. We have seen that only a small number of sporadic and imported cases were reported recently in China.

Until March 31, 2021, the epidemic situation in China is sporadic. According to official reports from 31 provinces (autonomous regions and municipalities) and Xinjiang, there have been 187 confirmed cases. 85,394 recovered and discharged from hospital, and 4636 deaths. A total of 989,820 close contacts have been traced, and 5042 close contacts are still under medical observation [6].

In order to consolidate border epidemic prevention, national health administration department actively organize and mobilize medical support teams composed of medical staff in hospitals with abundant medical resources to fight the epidemic. Without healthcare providers rushing as the "vanguard" and "forefront warriors" in this crisis, the epidemic is bound to worsen. On this occasion, many healthcare providers have been promptly trained to enhance the COVID-19 self-protection and treatment ability. Heavy workload resulted from the surge of patients with COVID-19 [7]. In these specific situations, medical personnel are often at the highest risk of exposure and psychological stress [8]. For instance, exposure to the virus, high work intensity, limited medical resources, perceived stigma, and significant lifestyle changes may all bring mental burden to front-line healthcare providers [9]. Notably, previous studies have focused on medical staff's mental health and fatigue at the early stages of the outbreak [10–12], but few investigations have identified the psychological status and the factors influencing medical staff in fever clinics from low-risk regions during the normalisation of COVID-19 prevention and control.

Normalisation of COVID-19 prevention and control meant that China enacted persistent strict, high standard epidemic prevention and control measures, which fight against the virus in daily life for a long time. The more precise and regular measures practice good hygiene, such as control of public access to the crowded places (Scan the health code to enter public places, wear mask, keep physical distancing, wash hands often). Additionally, the epidemiological investigation of COVID-19 becomes normal [13]. Hospitals and grassroots communities have joined public health workers to carry out expanded population screening and quarantine resolutely for preventing the spread of the epidemic. The local strictly restrict the floating migrants from risk areas, and effectively minimize the risk of epidemic input [14].

During the early stage of COVID-19, the virus showed high risk, infectivity, and severity, undoubtedly, which brought greater psychological burden to the medical staff. To date, as the epidemic prevention work has changed from emergency situation to the regular, hospitals are checkpoints for epidemic prevention and control confronting potential risk factors and the nosocomial infection prevention and control measures will exist in a long period of time. Stressful working environment and extra epidemic prevention work other than diagnosis and treatment lead to physical fatigue and psychological burden of medical staff [15], therefore, to bridge this gap, the present cross-sectional study aimed to predict mental health status and its associated factors amongst medical staff in Xinjiang province. Xinjiang province is located in the western region of China, there are obvious differences in the level of economic and social development between cities and regions in the province. Most of its medical and health resources are concentrated in Urumqi and other big cities (such as Shihezi, Karamay, Changji) while the medical resources in western and southern of Xinjiang are relatively scarce [16]. Our study focuses on primary medical institutions in less developed areas of Xinjiang, taking Bortala as an example.

We hypothesized that nurses (compared to doctors) would be associated with worse mental health outcomes, when the front-line epidemic prevention and control became normal and rigor. While social support and positive stress coping tendency could attenuate psychological problems of medical staff.

2. Methods

2.1. Subject

This study was conducted by distributing Questionnaire Star (www.wjx.cn) online survey from February 20, 2021 to March 10, 2021. All surveyed medical staff working on the front-line against the epidemic were selected from the major tertiary healthcare institutions in Bortala City, Xinjiang Province. Before starting the survey, they were informed of the research purpose. They then participated in the investigation voluntarily and anonymously. A total of 408 medical staff participated in this survey, amongst which 395 respondents finished the questionnaire completely, including 177 doctors and 218 nurses. They were stationed in the fever clinic during the period of prevention and control. The exclusion criteria were as follows: (a) participant not a front-line healthcare worker at Bortala's Hospital, (b) who were unwilling to cooperate with this investigation, (c) IP addresses were out of the surveyed area, (d) Logical error in the filling.

2.2. Measurements

2.2.1. Mental health assessment

The Symptom Checklist 90 (SCL-90) Scale was used in this study. It comprises 90 questions and has good internal consistency with a Cronbach's alpha of 0.85. Psychosomatic symptoms were divided into five grades, ranging from one to five points. The mental health of medical staff was assessed according to the score for nine factors (Somatisation, Obsessive–compulsive, Interpersonal relationship, Depression, Anxiety, Hostility, Terror, Paranoia, and Mental disease) [17]. If the score of any factor was above 2, it was considered to be screened as positive for psychological abnormalities [18]. By summing up the scores, higher total scores of the nine indicative

factors' score corresponded with poorer mental health status.

2.2.2. Social-support assessment

The social-support scale was widely used in psychology and mental health research [19]. The scale has a Cronbach's alpha of 0.949 [20], and it is classified into three dimensions, namely, subjective support, objective support, and support utilisation degree (total of 10 items to measure social relations) [21]. The total score is the sum of results from the three sub-scales. The mean of the total score, 34.56 ± 3.73, is regarded as the evaluation standard, and a higher score indicates more social support.

2.2.3. Simplified Coping-Style Questionnaire (SCSQ)

The SCSQ was utilised to measure participants' stress-coping tendency with a total of 20 items. Each item was scored between 0 and 3, which represented the extent of measures taken to cope with stress. Two dimensions were considered: positive (items 1–12) and negative (items 13–20) coping style. Each SCSQ item methodology was scored on a four-point Likert scale (never, occasionally, sometimes, and often) as 0, 1, 2, and 3 points, respectively [22]. For each of the two coping styles, high scores indicated that the participant primarily adopted a positive coping style when dealing with problems. The Cronbach's α coefficient of this scale is 0.85, proving good reliability.

2.3. Statistical analysis

Descriptive statistical analysis was used for the distribution of the number of medical staff detected through their sociodemographic characteristics. The psychological status of each dimension (continuous variable) for the medical staff was expressed as the mean ± standard deviation (X ± S). Welch's T-test was used to evaluate psychiatric symptoms' scores between two groups. Pearson's chi-square test was used to calculate p value that assessed sociodemographic and other related factors' differences. Binary logistic regression was used to analyse the factors affecting the psychological status of medical staff. A p value of <0.05 was deemed significant for this study. All statistical analyses were performed using IBM SPSS Statistics 25.00 for Windows.

3. Results

The average age of the 395 participants was 40.43 years old (SD is 9.92 years old; age range 20–67 years old). Of these, 20.25% (n = 80) were male, and 83.50% (n = 330) participants were married. Furthermore, 88.10% (n = 348) attained college degree or above. The proportion of doctors was 44.81% (n = 177), and nurses accounted for 55.19% (n = 218).

The mean and standard deviation for each of the variables SCL-90 were list in Table 1: The highest score was Obsessive-compulsive: 1.58 ± 0.57, and the relatively low rankings were Terror (1.18 ± 0.38), Mental disease (1.22 ± 0.42) and Paranoia (1.24 ± 0.44). The total score of the SCL-90 questionnaires was 47,806/395 = 121.03. The total symptom index of medical staff was (1.31 ± 0.40), comparable with the National Norm SCL-90 score (1.44 ± 0.43) in 2015 [23]. Results showed that the scores of SCL-90 factors of clinical front-line medical staff under public-health emergencies were significantly ($P < 0.001$) lower than the National Norm, except for the Somatisation and Obsessive-compulsive items ($P > 0.05$).

Different demographic characteristics influenced the mental health of front-line medical staff. If each factor of SCL-90 had a score lower than 2, it meant good mental health, and the reverse was regarded as poor psychological condition. Results identified 80 participants exposed to poor mental health. Chi-square test was conducted to analyse the factors of occupation, health status of the medical staff, whether they lived with the their elderly parents or not, social support, and stress-coping tendency in association with their mental health status (Table 2).

Our results (Table 3) also revealed that nurses were more likely to be exposed to mental health problems ($P < 0.05$, OR = 2.186) than clinicians during the investigation. Medical staff who lived with their elderly parents at home were also associated with a higher risk of psychological distress ($P < 0.05$, OR = 2.090). The probability of psychological problems also increased significantly amongst medical staff with poor physical health ($P < 0.001$, OR = 3.016). In the face of external pressure, individuals with a negative coping style of dealing with stress were more likely to show certain psychological distress ($P < 0.05$, OR = 2.854), whereas seeking social support was a protective factor of mental health of medical staff ($P < 0.05$, OR = 1.872).

4. Discussion

This study investigated the mental health of front-line medical staff under the normalisation of COVID-19 Epidemic Prevention and

Table 1
SCL-90 scores of medical staff during COVID-19 compared with National Norm's (X ± S).

Items	SCL-90, Mean ± SD (N = 395)	National Norm (N = 1388)	T	*P*
Somatisation	1.39 ± 0.48	1.37 ± 0.48	0.73	0.465
Obsessive-compulsive	1.58 ± 0.57	1.62 ± 0.58	1.23	0.221
Interpersonal relationship	1.33 ± 0.50	1.65 ± 0.51	11.17	<0.001
Depression	1.42 ± 0.54	1.50 ± 0.59	2.54	<0.01
Anxiety	1.31 + 0.49	1.39 ± 0.43	2.94	<0.01
Hostility	1.36 ± 0.49	1.48 ± 0.56	4.16	<0.001
Terror	1.18 ± 0.38	1.23 ± 0.41	2.27	<0.05
Paranoia	1.24 ± 0.44	1.43 ± 0.57	7.06	<0.001
Mental disease	1.22 ± 0.42	1.29 ± 0.42	2.93	<0.01

Table 2
Distribution of medical staff's mental health in different demographic characteristics.

Variable	Mental health status (N/%)		χ^2	*P*
	Good (N = 315)	Poor (N = 80)		
Gender			2.627	0.105
Male	69 (86.25)	11 (13.75)		
Female	246 (78.10)	69 (21.90)		
Age			1.962	0.375
<30	56 (84.85)	10 (15.15)		
30–39	90 (76.27)	28 (23.73)		
≥40	169 (80.09)	42 (19.91)		
Education			0.044	0.978
Technical secondary school	37 (78.72)	10 (21.27)		
Junior college	161 (79.70)	41 (20.30)		
Bachelor and above	117 (80.14)	29 (19.86)		
Marriage			0.080	0.778
Unmarried	51 (87.46)	14 (12.54)		
Married	264 (80.00)	66 (20.00)		
Health Status			23.32	<0.001
Healthy	211 (87.55)	30 (12.45)		
Unhealthy	104 (67.53)	50 (32.47)		
Occupation			5.309	0.021
Doctor	132 (74.57)	45 (25.43)		
Nurse	183 (83.95)	35 (16.05)		
Live with their elderly parents No	51 (17.78)	236 (82.22)	1.387	0.045
Yes	79 (73.15)	29 (26.85)		
Live with their children			0.261	0.609
No	124 (78.48)	34 (21.51)		
Yes	191 (80.59)	46 (19.41)		
Social support			11.177	0.001
Have	180 (86.12)	29 (13.88)		
None	135 (72.58)	51 (27.42)		
Stress coping tendency			21.953	<0.001
Positive	179 (89.05)	22 (10.95)		
Negative	136 (70.10)	58 (29.90)		

Control. We found that the prevalence of mental health problems was 20.25% (80/395) amongst the surveyed medical staff. Furthermore, the total symptom mean score (1.31 ± 0.40) of medical staff was lower than that of the general population (1.44 ± 0.43), indicating that the mental health of medical staff was relatively normal. This finding may be related to the fact that the investigation area was located in Xinjiang Province (categorised as a low-risk region during the research period), and effective preventive measures were implemented by the local government to contain COVID-19. The medical staff's strong sense of self-protection awareness [24–26] may have also contributed to their lower anxiety.

In cases of public-health emergency, nurses were more prone to psychological stress than doctors (OR = 2.186; 95% CI = 1.166–4.098), consistent with the research of Yuan Xu et al. [27]. This finding may be due to the fact that most nurses were women, who are usually more sensitive to risks and bear a significant emotional burden at the workplace [28–30]. Moreover, as a result of job characteristics, nurses had closer contact with patients many times a day when performing their duties, thereby prolonging their physical strain and the intense cognitive effort required of nurses in their occupation [31,32]. Indeed, the risk of infection was significantly higher than that of doctors in general or other working positions [33]. Adding the experience of work exhaustion of nurses may negatively lead to psychosomatic symptoms.

Individuals with poor health condition were more susceptible to psychological problems (OR = 3.016; 95 CI% = 1.702–5.342). The long hours and high intensity of medical work caused a dilemma in maintaining health. The poorer the individuals' physical quality, the higher their level of health anxiety [10]. Physical discomfort rendered them unable to properly use their abilities and talents to treat these mental problems. Generally, medical staff who were in good physical status adapted by paying more attention to personal hygiene and active healthy lifestyle. Although facing stressful situations, their positive emotions, responses and self-efficacy [34,35] effectively helped them recover from fatigue status and relieve psychological pressure [36].

From the perspective of family-bound ties, those who lived with their elderly parents at home (OR = 2.090; 95 CI% = 1.105–3.955) had poorer mental health. During the epidemic, despite all precautions taken by medical staff, the patient's migration and close contacts were uncertain. Once a medical worker was infected with the novel coronavirus at the workplace, they can spread the coronavirus to susceptible elderly at home. Given the rapid mutation and high contagiousness of the novel coronavirus, most confirmed deaths reported during the epidemic period were amongst the elderly population [37], thereby aggravating the concern of medical staff about the life-threatening conditions of their parents and their own possible infection [38].

In the present study, seeking social support (OR = 1.872; 95 CI% = 1.501–3.955) was a protective factor for the mental health of participants. Previous studies [39] have suggested that social support has a favorable impact on the relationship between physical stress and mental health, particularly the Buffering Model [40]. This model indicates that social resources (public education campaigns

Table 3
Analysis of factors influencing psychological status amongst medical staff (N = 395).

Variable	*β*	*P*	OR (95% *CI*)
Gender			
Male (Reference)			
Female	0.156	0.712	1.168 (0.512–2.668)
Age			
<30 (Reference)		0.514	
30–39	−0.584	0.249	0.558 (0.207–1.504)
≥40	−0.172	0.624	0.842 (0.424–1.672)
Education			
Technical secondary school (Reference)		0.497	
Junior college	−0.187	0.688	0.830 (0.333–2.067)
Bachelor and above	−0.379	0.240	0.685 (0.364–1.288)
Occupation			
Doctor (Reference)			
Nurse	0.782	0.015	2.186 (1.166–4.098)
Marriage			
Unmarried (Reference)			
Married	−0.074	0.865	0.929 (0.396–2.176)
Health Status			
Healthy (Reference)			
Unhealthy	1.104	0.000	3.016 (1.702–5.342)
Live with their elderly parents			
No (Reference)			
Yes	0.737	0.023	2.090 (1.105–3.955)
Live with their children			
No (Reference)			
Yes	0.531	0.088	1.701 (0.925–3.127)
Social support			
Have (Reference)			
None	0.627	0.033	1.872 (1.501–3.955)
Stress coping tendency			
Positive (Reference)			
Negative	1.049	0.011	2.854 (1.573–5.179)

and mentorship programs) operate as stress buffers, so people could likely get more access to instrumental assistance and esteem support after receiving positive recognition from their patients and relatives. Thus, external trust and identity can buffer self-perceived health threats and increase their persistence in the face of stressors [41].

We acknowledged that an individual's coping tendency significantly influenced their mental health status (OR = 2.584; 95 CI% = 1.573–5.179), and a positive coping style can reduce the negative psychological pressure. Coping with stress depends on the cognitive and behaviour-responsive effort of individuals encountering difficult situations [42]. Mazzella Ebstein highlighted that a problem-focused positive coping style is better for nurses to resolve occupational stress and maintain mental health [43]. For instance, actively avoiding anger, blaming, minimising catastrophic thinking [44], and adhering to optimism and humour are effective and positive coping strategies that are likely to reduce adverse events or psychological pressure [2].

5. Limitations

Our research has several limitations. Firstly, the study conducted from the sample size of the front-line medical staff working at Bortala City was not very large, so the accuracy of the psychological-distress estimation cannot be guaranteed, further, the investigators were only representative of the mental health of medical staff in this area. To some extent, the large gap in the development level of medical institutions across the nation, thus, this study could not reflect the mental health of the whole nation's health care workforce. Thirdly, the cross-sectional study started from February to March in 2021. During this period, the COVID-19 epidemic did not break out in Xinjiang Province to some extent. Thus, this design cannot precisely reflect the dynamic mental health status of the observed participants. Lastly, future research is still need to potentially include the longitudinal tracking of the related factors.

6. Conclusion

The COVID-19 crisis brought psychological stress to the front-line medical staff of Bortala City, Xinjiang Province. Results demonstrated that occupation, health condition, living with the elderly parents at home, social support, and stress-coping tendency were vital factors affecting front-line medical staff's mental health. Our study further indicated that more attention should be paid to the mental state of nurses during the COVID-19 pandemic. We recommend that the government and professional associations facilitate social supportive activities and essential psychological counselling to help improve the morale of healthcare workers. A targeted individual's psychological resilience should also be stimulated.

Lessons learned from historical and recent public health threats suggest that timely, effective risk communication would eliminate unknown factors, and reduce medical staff's panic, it is necessary for health committee to make practice guides and risk

communication principles. Deliver accurate and effective messages, and motivate appropriate self-protective behavior, for reducing medical staff's negative emotion. Health administration department and hospitals need to strengthen emergency medical supplies supply management system. Sufficient reserve of emergency supplies could enhance the confidence of medical groups to resist risks.

Author contributions

Q.W. contributed to conception and design of the work. she was responsible for writing original draft preparation and revising it critically. **D.L**. take responsibility for formal analysis, acquisition, data curation. **M.Y**.contributed to conception and design of the work, interpretation of data, organization and coordination. **YH.L**. was responsible for administrative, technical, or material support and supervision.

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Institutional review board statement

The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by Research Ethics Committee of Yanbian University (No. YB2020S210).

Informed consent statement

Informed consent was obtained from all subjects involved in the study.

Data availability statement

The datasets used or analyzed during the current study are available from the corresponding author on reasonable request.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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