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Original Article

Correlation between psychological status and social support in non-anti-epidemic clinical nurses during the COVID-19 pandemic: a cross-sectional observational study

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Abstract: Objectives: To explore the psychological status and perceived social support in non-anti-epidemic clinical nurses during the COVID-19 pandemic and the correlation between these two factors. Methods: Data of non-anti-epidemic clinical nurses from medical institutions in Nantong City of Jiangsu Province were collected using the Psychological Questionnaire for Emergent Events of Public Health (PQEEPH) and the Perceived Social Support Scale (PSSS) from February to March, 2020. Results: A total of 1,187 non-anti-epidemic clinical nurses were included into this study. The scores of the following dimensions in PQEEPH ranked from highest to lowest: depression (0.52±0.02) points, neurasthenia (0.37±0.01) points, fear (0.87±0.02) points, obsession-anxiety (0.24±0.01) points, and hypochondriasis (0.25±0.01) points. The total PSSS score was 63.46 points, of which, the scores of family support, friend support and other support were (21.89±4.27), (21.25±4.16) and (20.32±4.18) points respectively, indicating that these three factors had a negative correlation with emotional response. Conclusions: Non-anti-epidemic clinical nurses experience a negative psychological state during the COVID-19 pandemic and experience great support from family and friends.

Keywords: COVID-19 pandemic, psychological status, public health safety, mental health, non-anti-epidemic clinical nurses, social support

Introduction

The novel coronavirus is highly transmissible and has spread to 44 countries on all continents except Antarctica. The coronavirus disease 2019 (COVID-19) pandemic was declared a public health emergency of international concern by the World Health Organization in January 2020 [1]. Public health emergencies can cause serious harm to public health in psychological, socioeconomic, political and cultural aspects. The COVID-19 pandemic has greatly affected people's lives, leading to the closure of businesses and suspension of traveling and public services, and requiring people to stay isolated in their homes. The instinctive and natural human response for any type of danger in their surroundings are panic and fear. Clinical nurses, as frontline personnel in COVID-19 pandemic prevention and control, are under intense pressure from work due to the risk of infection, and thus they are more prone to anxiety, depressed mood, and other psychological symptoms [2]. Several studies [3, 4] have proved that COVID-19 has a negative effect on the psychological and somatic status in frontline nurses, which is similar to the results of a longitudinal study illustrating that over one-third of nurses suffer from depression, anxiety, and insomnia during the COVID-19 pandemic [5]. Frontline nurses are at risk for specific psychological impacts of the pandemic, including burnout, sleep deprivation, posttraumatic stress disorder (PTSD) symptoms, psychological distress, secondary trauma and stress. Therefore, much attention should be paid to the nurses' psychological status and its related influencing factors [6].

A study revealed that nearly half of all medical staff in the United States have experienced serious mental health symptoms, including suicidal thoughts [7]. Another study indicated that about one-third of medical staff in Japan have experienced job burnout [8]. As the pressure and loneliness increase, the coping strategies and coping abilities of medical staff are limited [9]. The study of Liao C et al. suggested that second-line nurses without direct contact with diagnosed COVID-19 patients have more severe pressure compared with the first-line nurses who have direct contact with COVID-19 patients [10].

Social support is a dynamic process of interpersonal interaction that occurs in social relationships. This interaction includes building interpersonal resources, providing material, emotional and informational help to the persons needing support, who are enabled to make use of the help from others to relieve pressure. Social support can be divided into actual social support and perceived social support. Barrera [11] considers perceived social support as an individual's expectation and assessment of social support, as well as their belief about the social support that may be available. Perceived social support is defined as the emotional experience of being respected, understood, and supported [12]. Cohen and Wills [13] believe that perceived social support produces a pressure relieving effect, namely, when individuals are in stressful situations, perceived social support can alleviate their stress in responding to the stressful situation. It has been shown that higher perceived social support can prevent the development of post-traumatic stress disorder symptoms [14] and has a predictive value for a sense of meaning in life. When the nurses experience support and encouragement from their leaders, family and friends, and even their patients, their sense of worth and meaning are increased [15]. An existing study showed that the higher clinical nurses' perceive their social support is, the higher the pressure level caused by challenging work is [16]. Furthermore, we can say that the higher the score in nurses' perceived social support is, the higher their satisfaction with nursing work is.

The study by Vaingankar JA et al. has shown that psychological disorders are correlated with lower perceived social support [17]. Social support can improve the quality of life through reducing emotional related symptoms [18]. A higher level of social support is positively correlated with self-efficacy and higher sleep quality and negatively correlated with the degree of anxiety and pressure [19, 20]. The study by Vaingankar JA et al. indicated that mental disorder is correlated with decreased perceived social support, and marriages may affect this relationship [17]. A study revealed that married people tend to have a lower level of mental disorders and a higher level of perceived social support [21]. A study of adolescents by Rubio et al. revealed that psychological disorders such as depressive symptoms had the strongest interaction with family support among the four dimensions of social support, followed by the supports from important figures, school and friends [22]. The study of Howard, S et al. showed that perceived social support, that is an emotional experience and satisfaction for individuals to feel respected, supported and understood, is regarded as one of the important mediating factors determining the relationship between psychological pressure and health [23].

In this study, we investigated the psychological status of non-anti-epidemic clinical nurses in medical institutions during the COVID-19 pandemic, as well as their degree of perceived social support. We also examined the correlation between these two factors to provide a basis for supporting the nursing team, actively responding to the COVID-19 pandemic, and thus ensuring public health safety.

Based on the above, this study was designed to determine (1) non-anti-epidemic clinical nurses' psychological status and their perceived social support during the COVID-19 pandemic and (2) the correlation between psychological status and perceived social support in non-anti-epidemic clinical nurses during the COVID-19 pandemic.

Materials and methods

Sampling

In February and March of 2020, we used a cluster sampling method to collect the data of 1,187 non-anti-epidemic clinical nurses from medical institutions in Nantong, Jiangsu, China.

Table 1. Demographic characteristics of non-anti-epidemic clinical nurses in health facilities in Nantong during the COVID-19 pandemic (*N*=1,187; %)

	Category	Number	Percentage
Gender	Male	11	0.93
	Female	1,176	99.07
Age (years)	≤25	134	11.29
	26-30	428	36.06
	31-35	301	25.36
	36-40	158	13.31
	41-45	87	7.33
	>45	79	6.66
Education level	Technical secondary school	20	1.68
	Junior college	219	18.45
	Undergraduate	946	79.7
	Master's degree and above	2	0.17
Title	Nurse	225	18.96
	Nurse practitioner	538	45.32
	Nurse in charge	343	28.9
	Assistant director nurse	77	6.49
	Director nurse	4	0.34
Years of nursing experience	≤5	308	25.95
	6-10	443	37.32
	11-15	170	14.32
	16-20	112	9.44
	21-25	76	6.40
	>25	78	6.57
Marital status	Unmarried	295	24.85
	Married	876	73.8
	Divorced	16	1.34
Department	Emergency	68	5.73
	Internal medicine	363	30.58
	Surgery	590	49.71
	ICU	104	8.76
	Pediatrics	62	5.22

Inclusion criteria: (1) registered nurses; (2) nurses working in the clinical frontline during the COVID-19 pandemic but not directly involved in caring for COVID-19 patients; and (3) nurses who signed the informed consent form and were willing to participate in the questionnaire survey. Exclusion criteria: (1) registered nurses not working in a clinical setting/institution due to studying, further education, sick leave, or casual leave and (2) registered nurses working in the administration department, COVID-19 isolation wards, and fever clinics. The mean age of 1,187 participants was 32.46 years (SD=6.73). The details are shown in **Table 1**.

Survey methods

The research tools used in this study included the Psychological Questionnaire for Emergent Events of Public Health (PQEEPH) [24] and the Perceived Social Support Scale (PSSS). The first questionnaire has been revised [24], which is divided into five dimensions such as depression, neurasthenia, fear, obsession-anxiety and hypochondriasis, with a total of 25 items, including all kinds of emotional responses which are likely to occur in people under sudden public health events [24]. The higher the score in one dimension is, the more severe the emotional response and the psychological problems

are. The items are rated on a scale from 0 to 3 for the degree (none, mild, moderate, and severe) and frequency (occasionally, sometimes, often, and always) of the emotional response. The total score on each dimension is divided by the number of items to obtain the average score on that dimension. The Cronbach's α coefficient of the questionnaire was 0.629, the test-retest reliability is 0.631, and the cumulative contribution of variance is 56.847% [24, 25].

The second questionnaire, that is the Perceived Social Support Scale (PSSS), was designed by Zimet [26] and revised by Qianjin [25]. The scale consists of 12 self-rated items, which is *composed of three subscales* including family support, friend support, and other support. This scale is applicable to people over 18 years of age. The higher the score is, the greater the perceived social support is. The scores are rated on a 7-point Likert-type scale from 1 (strongly disagree) to 7 (strongly agree). The possible scores range from 12 to 84. The Cronbach's α coefficients for overall support, family support, friend support, and other support are 0.705, 0.744, 0.613, and 0.830, respectively [26]. Lastly, the general information of participants such as age, years of working, gender, education level, professional title and marital status were collected.

This study was approved by the ethics committee of our hospital (approval No.: EK2020021). All procedures performed in this study involving human participants were conducted in accordance with the Declaration of Helsinki (2013). The online questionnaire platform-Questionnaire Star (https://www.wjx.cn/) was used to survey the participants. The authors designed the informed consent form and made a questionnaire research quick response (QR) code and communicated with the head of the nursing department of the medical institution. After obtaining consent, the corresponding responsible persons distributed the research QR code to the WeChat work groups of clinical nurses in each hospital. Respondents participated voluntarily and used their smartphones to scan the QR code and fill out the questionnaire online. Each participant provided informed consent on the included form; furthermore, the questionnaire could only be filled out once for each IP address and was required to be completed within a specified time. A total of 1,201 questionnaires were collected. The repetition rate was around 5%, and 14 repeated questionnaires were excluded. Finally, a total of 1187 valid questionnaires were analyzed, and the effective response rate was 98.83%.

Data analysis

SPSS 17.0 software package was used for statistical analysis. Enumeration data were expressed as frequency and composition ratio. Measurement data were expressed as mean ± SD and analyzed by using Pearson's correlation coefficient. A p value < 0.05 was considered to be statistically significant.

Results

Results of PQEEPH scores

The PQEEPH scores were (0.52±0.02) points for depression, (0.37±0.01) points for neurasthenia, (0.87±0.02) points for fear dimension, (0.24±0.01) for obsession-anxiety dimension, and (0.25±0.01) points for hypochondriasis dimension.

Results of PSSS scores

The PSSS total score was (63.46±11.46) points, while the subscale score was (21.89±4.27) points for family support, (21.25±4.16) points for friend support, and (20.32±4.18) points for other support; see **Table 2**.

Correlations between PQEEPH scores and PSSS scores

The Pearson correlation analysis showed that PSSS total score showed a negative correlation with five dimension scores of PQEEPH (R=-0.291, -0.317, -0.170, -0.241, -0.131; P= 0.000) among 1,187 non-anti-epidemic clinical nurses during the COVID-19 pandemic (**Table 3**).

Discussion

Considering the psychological status of the 1,187 non-anti-epidemic clinical nurses during COVID-19 pandemic, the nurses scored the highest on the fear dimension, followed by the depression dimension. Of the 25 items, the top 5 items with the highest scores were "I try not to go to hospitals or crowed places and always wear masks when contacting people", "I worry

Table 2. Item scores of emotional response and perceived social support of 1,187 non-antiepidemic clinical nurses during the COVID-19 pandemic (score [± SD])

	Dimension	Number of items	Score	Mean score of the item
Psychology in public health emergent event	Depression dimension	6	3.12 (±3.38)	0.52 (±0.02)
	Neurasthenia dimension	5	2.33 (±2.53)	0.37 (±0.01)
	Fear dimension	6	5.23 (±3.26)	0.87 (±0.02)
	Obsession-anxiety dimension	5	1.16 (±1.88)	0.24 (±0.01)
	Hypochondriasis dimension	2	0.49 (±0.80)	0.25 (±0.01)
Perceived social support	Family support dimension	4	21.89 (±4.27)	5.47 (±1.06)
	Friend support dimension	4	21.25 (±4.16)	5.31 (±1.04)
	Other support dimensions	4	20.32 (±4.18)	5.08 (±1.05)
	Total score for perceived social support	12	63.46 (±11.46)	5.28 (±0.95)

Table 3. Correlation analysis of emotional response and perceived social support among non-antiepidemic clinical nurses during the COVID-19 pandemic (R)

Dimension	Depression	Neurasthenia	Fear	Obsession-anxiety	Hypochondriasis	Family support	Friend Support	Other support
Neurasthenia	0.779[a]							
Fear	0.557[a]	0.605[a]						
Obsession-anxiety	0.731[a]	0.818[a]	0.627[a]					
Hypochondriasis	0.491[a]	0.588[a]	0.625[a]	0.654[a]				
Family support	-0.273[a]	-0.303[a]	-0.147[a]	-0.246[a]	-0.125[a]			
Friend support	-0.241[a]	-0.269[a]	-0.155[a]	-0.202[a]	-0.126[a]	0.725[a]		
Other support	-0.278[a]	-0.289[a]	-0.166[a]	-0.219[a]	-0.219[a]	0.695[a]	0.794[a]	
Total score for perceived support	-0.291[a]	-0.317[a]	-0.170[a]	-0.247[a]	-0.247[a]	0.890[a]	0.923[a]	0.912[a]

Note: a < 0.01.

about the possibility that myself and my family members get infected". "I wash my hands and scrub things repeatedly, but always feel unclean", "I am very concerned about any physical discomfort", and "I have less energy than before", respectively. It can be seen that the high infectivity and pathogenicity of the novel coronavirus and the relative lack of protective gear during the pandemic caused emotional responses such as fear and depression in non-anti-epidemic clinical nurses. This result is consistent with the findings of Kotera Y and Liao C [9, 10]. Although the workload of non-anti-epidemic clinical nurses was lower than before due to the pandemic, they still needed to have face-to-face contact with patients and perform procedures such as pharyngeal swab collection, they even felt that they were suspected of being "close contacts" and worried that they or their family members would be infected. They paid close attention to any physical discomfort that they or their family members experienced, and felt pressure from both work and family. They reported that they had a declining sleep quality and less energy than before and were experiencing fatigue easily. They also reported that they might wash their hands or wear gloves compulsively, and involuntarily pay attention to information related to the pandemic and self-protection issues, and actively bought masks, gloves and even disposable ponchos to protect themselves and their family members; and they consciously reduced social interaction and communicated through the network system as much as possible. It can be seen from the above that the non-anti-epidemic clinical nurses had negative emotions such as depression and anxiety in the process of coping with the COVID-19. The fear of infection, insufficient supply and lack of protective materials, and insufficient psychological and social support services are the main risk factors affecting their mental health.

The PSSS total score of participants in this study was at a moderate level, which was lower than that of ICU nurses in a previous study [27], and basically consistent with those of operating room nurses [28] and community nurses [29]. **Table 2** shows that the dimension with the

highest score among the all dimensions of the PSSS was family support, followed by friend support and other support. The family support with the highest score was consistent between ICU and operating room nurses; however, the other support and friend support scored the second and third highest points respectively among ICU and operating room nurses. This is inconsistent with the results of the current study. However, the community nurses perceived more friends and other support than family support [29]. The survey findings indicated that non-anti-epidemic clinical nurses got the greatest support and help from their families when they were engaged in clinical nursing during the COVID-19 pandemic, this is mainly related to the fact that some family members needed to stay at home and control their social activities, and couldn't return to work due to pandemic prevention and control requirements during the COVID-19 pandemic, so that they had more time to communicate with the nurses, and the family affection and support were obviously increased. This shows that it is necessary to increase social and personal support. A study has shown that the clinical nurses with strong support at the organizational and individual levels can better cope with the increasing pressure and loneliness, leading to a better patient care [9].

In 1,187 non-anti-epidemic clinical nurses during the COVID-19 pandemic, there was a medium to high positive correlation among all dimension scores of PQEEPH, and there was also a medium to high positive correlation among all dimension scores of PSSS, indicating there was a good correlation among all dimension scores, and PQEEPH total score and its five dimension scores had a low negative correlation with PSSS total score and its three dimension scores. This implies that the higher the PSSS score is, the lower the PQEEPH score is. It has been shown that social support can effectively reduce the degree of alexithymia [30] and that human beings have both natural and social attributes; therefore, individuals need the support from others when facing pressure. Perceived social support can improve individuals' mental health; the higher the level of social support is, the better the mental health and well-being are, and the fewer the psychological symptoms are [31, 32]. A study suggested that reduced social support is considered to be a mediator between social alienation and negative mental health outcomes [33]. Our results showed that during the COVID-19 pandemic, even in non-anti-epidemic clinical nurses, there was a certain negative emotional response and psychological pressure. Therefore, as a group with high-intensity, high-risk, and high-stress clinical frontline work [34], non-anti-epidemic clinical nurses need support from their families, colleagues, leaders and friends. Nurse managers should to pay close attention to the psychological and emotional changes, provide timely guidance and assistance when emotional problems occur and provide safety guarantees among nurses at all levels to improve their perceived social support, increase their work efficiency and better protect public health. When the emotional problems occur, clinical nurses can have increased perceived social support and reduced negative emotions by maintaining social contact through appropriate protective measures, network social platform or telecommunications, and attention should be paid to increasing the accessibility, frequency of contact and quality of the social support [35].

Limitations

This study has certain limitations. First, we conducted a cross-sectional survey on correlation analysis, which preclude causal inferences. Future studies should employ a longitudinal design to understand the causal relationship between emotional response to a public health emergency and perceived social support. Second, the research objective of this study was limited, and the research scope was insufficient. Future studies should be performed with larger populations and psychosocial interventions will be conducted to further examine this hypothesis [2].

Conclusions

Nursing administrators should pay attention to the psychological status and social support of non-anti-epidemic clinical nurses during the COVID-19 pandemic and similar health emergencies. Accordingly, adequate nursing quality can be ensured by employing measures such as supplying adequate COVID-19 protective materials, strengthening protective measures to facilitate safe working conditions, providing training and supervision, establishing good psy-

chological and social support systems to maintain clinical nurses' physical and mental health, motivating clinical nurses to improve their work commitment and performance, and maintaining the quality of nursing practices and safety of nurses.

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Disclosure of conflict of interest

None.

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