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Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control

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ABSTRACT

Since December 2019, more than 79,000 people have been diagnosed with infection of the Corona Virus Disease 2019 (COVID-19). A large number of medical staff was sent to Wuhan city and Hubei province to aid COVID-19 control. Psychological stress, especially vicarious traumatization caused by the COVID-19 pandemic, should not be ignored. To address this concern, the study employed a total of 214 general public and 526 nurses (i.e., 234 front-line nurses and 292 non-front-line nurses) to evaluate vicarious traumatization scores via a mobile app-based questionnaire. Front-line nurses are engaged in the process of providing care for patients with COVID-19. The results showed that the vicarious traumatization scores for front-line nurses including scores for physiological and psychological responses, were significantly lower than those of non-front-line nurses ($P < 0.001$). Interestingly, the vicarious traumatization scores of the general public were significantly higher than those of the front-line nurses ($P < 0.001$); however, no statistical difference was observed compared to the scores of non-front-line nurses ($P > 0.05$). Therefore, increased attention should be paid to the psychological problems of the medical staff, especially non-front-line nurses, and general public under the situation of the spread and control of COVID-19. Early strategies that aim to prevent and treat vicarious traumatization in medical staff and general public are extremely necessary.

1. Introduction

Since December 2019, the outbreak of COVID-19 in Wuhan has infected more than 70,000 individuals. China has taken active and effective actions to provide medical support for aiding in the control of the rapid spread of COVID-19. From January 24, 2020 (Chinese New Year's Eve), China has sent more than 30,000 medical staff to Wuhan city and Hubei province to provide medical support. Researchers have validated that these efficient and feasible strategies and measures are timely and effective. Medical staff often has a variety of psychological problems under a high-pressure and risk anti-pandemic situation (Kang et al., 2015). Therefore, psychological assessment and intervention in victims and rescuers, such as medical staff and volunteers, are of great importance for the control of large-scale disasters and pandemics. This

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notion is not only beneficial for early actions and measures for psychological intervention, but also for tremendously improving disaster and pandemic control and rapid social recovery (Liu et al., 2013).

In 1996, Saakvitne and Pearlman first proposed vicarious traumatization (Geeta Patel-Kerai, 2017). The term initially referred to the phenomenon where professional psychotherapists are involuntarily affected by the bidirectional interactions of the relationship between consultation and interview due to long-term contact with patients with mental diseases. In other words, psychotherapists experienced mental symptoms similar to psychological trauma (Collins and Long, 2003). Currently, the scope of application of vicarious traumatization is extended to a large number of cruel and destructive disasters, where the degree of damage exceeds psychological and emotional tolerance and indirectly leads to various psychological abnormalities (Mathieu, 2014). These psychological abnormalities are derived from sympathy for survivors of a trauma, which causes serious physical and mental distress, even mental breakdown (Sinclair and Hamill, 2007).

The main symptoms of vicarious traumatization such as loss of appetite, fatigue, physical decline, sleep disorder, irritability, inattention, numbness, fear, and despair are well recognized to be experienced by all individuals. Frequently, these symptoms are accompanied by trauma responses and interpersonal conflicts that even compel others to commit suicide (Creighton et al., 2018). In this regard, the study proposes that medical staff, volunteers, and the general public will more or less experience vicarious traumatization during the spread and control of the COVID-19 pandemic. Therefore, identifying and providing intervention for vicarious traumatization at an early stage is important.

In this study, 214 general public and 526 nurses (i.e., 234 front-line nurses and 292 non-front-line nurses), were employed and evaluated via the Chinese version of the vicarious traumatization evaluation scale. In addition, risk factors finally leading to vicarious traumatization among medical staff were evaluated. Therefore, our findings can likely provide theoretical basis and viable strategies for early psychological interventions during COVID-19 control.

2. Methods

2.1. Settings and participants

The study is descriptive in nature, utilizes a mobile phone app-based questionnaire survey, and was carried out during the COVID-19 pandemic from February 17, 2020 to Feb 21, 2020 (i.e., five weekdays). The Ethics Committee of the First Affiliated Hospital of Nanjing Medical University approved the study (approval number: 2020-SR-101). The study employed licensed registered nurses who worked in hospitals and general public (non-medical staff). Front-line nurses are engaged in the process of providing care for patients with COVID-19. Owing to the fact that the investigation was conducted during the COVID-19 pandemic, the current isolation policy calls for reduced face-to-face contact and communication and avoidance of large gatherings and activities. Therefore, an anonymous questionnaire was structured using a mobile app called “Sojump” (www.sojump.com) and pushed to individuals via WeChat after obtaining informed consent. Finally, a total of 740 individuals (i.e., 526 nurses and 214 general public), filled in the questionnaire.

2.2. Demographic data and vicarious traumatization questionnaire

Demographic data included gender, age, hospital classification, years of working, departments, professional titles, undertaking management work or not, educational background, marriage status, and single child or not. The Chinese version of the vicarious traumatization questionnaire was compiled based on qualitative interviews with rescuers in the Wenchuan earthquake in China and existing international trauma-related scales, such as the Traumatic Stress Institute Belief Scale, Impact of Event Scale, and Vicarious Trauma Scale (Pearlman, 1990; Sharon Rae Jenkins, 2002; Vrklevski and Franklin, 2008). The vicarious traumatization questionnaire adopted in the current study has a total of 38 items, which are composed of two dimensions, namely, physiological responses (11 items) and psychological responses [i.e., emotional responses (nine items), behavioral responses (seven items), cognitive responses (five items), and life belief (six items)]. Each question score ranged from 0 (never) to 5 (always). Cranach’s alpha for the questionnaire reached 0.93, whereas that for each dimension ranged from 0.73 to 0.92. The cumulative variance contribution rate reached 52.56%, which indicates positive reliability and validity.

2.3. Statistical analysis

In this study, continuous and abnormally distributed data were described using the median and interquartile range (IQR: 25%–75%), whereas the Mann–Whitney U test or Kruskal–Wallis H-test was used to assess group differences. Descriptive statistics involved frequencies (%) for categorical variables, and the chi-square test or Fisher’s exact test was used to assess group differences. Data were considered statistically significant when $P < 0.05$. Analyses were performed using SPSS version 20.0 (IBM Co. LTD, Chicago, IL, USA).

3. Results

3.1. Comparison of general characteristic between general public, front-line nurses, and non-front-line nurses

In this study, a total of 740 individuals (i.e., 214 general public, 234 front-line nurses, and 292 non-front-line nurses) were enrolled in the study. Gender, age, marriage status, and single child or not pointed to a significantly statistical difference between the general public, front-line nurses, and non-front-line nurses. Furthermore, results showed a statistical difference in hospital classification, departments, and professional titles between front-line and non-front-line nurses (Table 1).

3.2. Comparison of vicarious traumatization scores between the general public, front-line nurses, and non-front-line nurses

The vicarious traumatization scores showed a statistical difference between the general public, front-line nurses, and non-front-line nurses (Table 2). Furthermore, vicarious traumatization scores were separately compared; front-line nurses had significantly lower vicarious traumatization scores than the general public and non-front-line nurses. However, no significant difference was noted in vicarious traumatization scores between the general public and non-front-line nurses. In addition, the vicarious traumatization scores of the front-line and non-front-line nurses were compared. Collectively, the study found that vicarious traumatization and sub-items scores showed a significant increase in non-front-line nurses than those of front-line nurses.

4. Discussion

The results showed that the severity of vicarious traumatization in front-line nurses, non-front-line nurses, and the general public is relatively differential. The study found that although no significant differences were observed between the severity of vicarious traumatization in the non-front-line nurses and the general public, its severity was significantly higher than that of the front-line nurses who came in close contact with patients with COVID-19. In addition, the results demonstrated that the severity of vicarious traumatization in non-front-line nurses was more serious, whereas that of married and divorced or widowed nurses were higher than that of unmarried nurses. To the best of the authors’ knowledge, this study is the first to focus on the psychological status, especially vicarious traumatization, of nurses aiding in COVID-19 control.

Although the severity of vicarious traumatization in the general

Table 1
Comparison of general characteristics between the general public, front-line nurses and non-front-line nurses.

	GP (n = 214)	FLNs (n = 234)	nFLNs (n = 292)	*P* value
Gender, %				< 0.001[a]
Male	86 (40.19)	28 (11.97)	48 (16.44)	
Female	128 (59.81)	206 (88.03)	244 (83.56)	
Age, median (IQR), yr	25 (22–38.3)	29.5 (26–34)	29 (25–34)	< 0.001[b]
Hospital classification, %	NA			< 0.001[c]
Grade 3A		152 (64.96)	235 (80.48)	
Grade 3B		29 (12.39)	37 (12.67)	
Grade 2A		38 (16.24)	15 (5.14)	
Grade 2B		7 (2.99)	2 (0.68)	
Others		8 (3.42)	3 (1.03)	
Years of working, median (IQR), yr	NA	8 (3.8–13)	7.5 (3–11)	0.187[b]
Departments, %	NA			< 0.001[a]
Internal medicine		60 (25.64)	62 (21.23)	
Surgery		39 (16.67)	142 (48.63)	
Emergency		13 (5.56)	11 (3.77)	
Critical care medicine		96 (41.03)	32 (10.96)	
Gynecology & Pediatrics		12 (5.13)	19 (6.51)	
Others		14 (5.98)	26 (8.9)	
Professional titles, %	NA			0.044[a]
Nurse		31 (13.25)	61 (20.89)	
Senior nurse		128 (54.7)	129 (44.18)	
Nurse-in-charge		61 (26.07)	87 (29.79)	
Deputy chief or higher		14 (5.98)	15 (5.14)	
Management work, %	NA			0.182[a]
Yes		69 (29.49)	71 (24.32)	
No		165 (70.51)	221 (75.68)	
Education background, %	NA			0.115[a]
College degree		43 (18.38)	39 (13.36)	
Bachelor or higher degree		191 (81.62)	253 (86.65)	
Marriage, %				< 0.001[c]
Unmarried	124 (57.94)	105 (44.87)	113 (38.7)	
Married	88 (41.12)	123 (52.56)	176 (60.27)	
Divorce or others	2 (0.01)	6 (2.56)	3 (1.03)	
Single-child, %				0.001[a]
Yes	80 (37.38)	78 (33.33)	143 (48.97)	
No	134 (62.62)	156 (66.67)	149 (51.03)	

Abbreviations: FLNs, front-line nurses; GP, general public; IQR, interquartile range; NA, not applicable; nFLNs, non-front-line nurses.
[a] Chi-square test; [b] Mann–Whitney *U* test; [c] Fisher's exact test.

public is higher than that of the front-line nurses, the study must emphasize that no difference was observed in the scores of vicarious traumatization between the general public and non-front-line nurses. This finding may be highly related to the fact that China has adopted a strict isolation policy to deal with the epidemic, thus calling on the public to reduce face-to-face contact and communication to reduce the probability of viral transmission. During this period of COVID-19 proliferation, the majority of the general public is staying at home for isolation. Thus, they gained more time to gather knowledge about the epidemic and the lives of other people, especially those of patients with COVID-19, through the internet and media (Hu et al., 2015). The general public not only feels sympathy for patients with COVID-19 but is also concerned about the medical staff. In the issue of public health, psychological endurance is lacking. This notion suggests that during the spread and control of COVID-19, propaganda strategies should be well-organized and effective. In addition, early intervention measures should be taken to alleviate the psychological issues faced by the general public (Kang et al., 2018).

Results of the analysis indicate that the front-line nurses mainly originated from 3A and 3B hospitals (China's hospital classification) and from critical care medicine and internal medicine departments. This group is mainly composed of middle-level backbone members, where most of them are single children and have not given birth. Close contact with patients with COVID-19 and direct exposure to the patients' physical and psychological sufferings have been well recognized to render front-line nurses prone to suffer from vicarious traumatization; therefore, the society and psychotherapists should actively pay more attention to the psychological problems of front-line nurses (Borenstein, 2018; Taylor et al., 2016). However, the results of the study imply that the vicarious traumatization severity of non-front-line nurses, regardless of physical or psychological responses, is more serious than that of front-line nurses. This finding suggests that non-front-line nurses are more likely to suffer from psychological problems, whereas the psychological endurance of front-line nurses is stronger. This notion may be due to the fact that front-line nurses are voluntarily selected and provided with sufficient psychological preparation. Second, the selected front-line nurses are mainly middle-level backbone staff with working experience and psychological capacity. In addition, the vicarious traumatization of front-line nurses is typically derived from sympathy for patients with COVID-19, whereas non-front-line nurses not only feel sympathy for patients with COVID-19, but also bear the worry and sympathy for front-line colleagues. Finally, the front-line nurses are more knowledgeable about the epidemic than the general public and non-front-line nurses. Therefore, a transparent announcement of epidemic information is very beneficial to social and psychological constructs and psychological intervention at a later time (Wang et al., 2006). Collectively, the abovementioned factors may be possible reasons for the higher severity of vicarious traumatization in non-front-line nurses than in front-line nurses.

The study has certain limitations. First, the observational objects are mainly nurses. The reason for this option is that the proportion of nurses in the medical teams for COVID-19 control constitutes more than 70%, such that investigating nurses is representative. Secondly, this study is a descriptive cross-sectional one, which is unable to explore the causal linkage between factors. Therefore, carrying out a longitudinal large-sized intervention study and enrolling clinical doctors and other medical workers, such as technicians, is necessary to further explore the pathogenesis, therapeutic strategies, and mechanisms of vicarious traumatization.

In summary, the results suggest that the general public and medical staff suffer from vicarious traumatization. However, the vicarious traumatization of non-front-line medical staff is more serious than that

Table 2
Comparison of vicarious traumatization severity between the general public, front-line nurses and non-front-line nurses.

	GP (n = 214)	FLNs (n = 234)	nFLNs (n = 292)	Z scores	*P* value
Vicarious traumatization	75.5 (62–88.3)	64 (52–75)	75.5 (63–92)	57.258	< 0.001
Physiological responses	18 (13–24)	17 (12–21)	19 (13.3–25)	15.875	< 0.001
Psychological responses	57 (47–65.3)	46.5 (38–55)	56.5 (47–68.8)	70.729	< 0.001
Behavioral responses	15 (12–18)	13 (10–15)	15 (12–18)	39.421	< 0.001
Emotional responses	19 (15–23)	15 (12–18.3)	19 (15.3–23)	73.992	< 0.001
Cognitive responses	8 (6–10)	7 (5–9)	9 (7–11)	23.680	< 0.001
Life beliefs	13.5 (11–17)	11 (9–13)	14 (11–17)	79.529	< 0.001

Abbreviations: FLNs, front-line nurses; GP, general public; nFLNs, non-front-line nurses.

of front-line medical staff. Therefore, early intervention of vicarious traumatization and psychological stress for the general public and medical staff, as well as the transparent announcement of epidemic information can facilitate the psychological treatment and control of COVID-19.

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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