International Journal of Nursing Sciences xxx (2016) 1–5

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Contents lists available at ScienceDirect

International Journal of Nursing Sciences

journal homepage: http://www.elsevier.com/journals/international-journal-of-nursing-sciences/2352-0132

Prevalence and related factors of post-traumatic stress disorder among medical staff members exposed to H7N9 patients

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ARTICLE INFO

Article history:
Received 24 June 2016
Accepted 7 December 2016
Available online xxx

Keywords:
H7N9
PTSD
PCL-C
Medical staff
Stress symptoms

ABSTRACT

Objective: This study aimed to evaluate the prevalence and related factors of post-traumatic stress disorder (PTSD) symptoms among doctors and nurses who were exposed to H7N9 patients during the H7N9 influenza epidemic. To provide scientific basis for promoting the physical and psychological health of these staff members.

Method: The 102 medical staff workers who were exposed to H7N9 patients were recruited through convenient sampling between January 2015 and May 2016. We used a self-reported questionnaire, the PTSD Checklist-Civilian Version (PCL-C), to evaluate the PTSD symptoms among doctors and nurses from an intensive care unit ($n = 61$), a respiratory department ($n = 20$), and an emergency department ($n = 21$). We then analyzed the related factors.

Results: Around 20.59% of the tested doctors and nurses showed PTSD symptoms. The sample had a mean PCL-C score of 30.00 ± 9.95. The differences in the scores of doctors and nurses with different genders, ages, professional titles, contact frequencies, trainings, and experiences were statistically significant ($P < 0.05$, $P < 0.01$). Moreover, t-tests and one-way analysis of variance showed that nurses received higher scores than doctors, female participants received higher scores than male participants, and the participants with low professional title and high contact frequency, aged between 20 years and 30 years, with less than five years of work experience, having not received related training and with no related experience obtained higher PCL-C scores than the others ($P < 0.05$, $P < 0.01$).

Conclusion: The PTSD level of doctors and nurses after their exposure to H7N9 patients was high, which warrant further research. Health and medical institutions should pay attention to the physical and psychological health of these staff members.

1. Introduction

A novel avian-origin influenza (H7N9) virus, which had not been documented anywhere in the world, was reported in China on March 30, 2013 [1]. A total of 131 laboratory-confirmed cases of H7N9 infection had been documented as of May 21, 2013, among which 36 resulted in death [2]. The number of fatalities related to the virus continues to increase. Most H7N9 patients showed signs of rapidly progressing lower respiratory tract infection, severe acute respiratory distress, septic shock, and multi-organ failure [3], while only a few manifested moderate illnesses [4]. The H7N9 outbreak not only raised public health concerns but also caused tremendous psychological distress, particularly among doctors and nurses who were exposed to H7N9 patients because these practitioners are among the most vulnerable population during a global event.

Exposure to trauma has been associated with psychological distress and post-traumatic stress disorder (PTSD) [5]. PTSD is a state of psychological unbalance following an exposure to traumatic events; people with PTSD often re-experience traumatic events, demonstrate avoidance behavior, and become irritable [6]. PTSD is a severe anxiety disorder that can result in serious disability across several domains of functioning [7]. PTSD symptoms have also been associated with poor quality of life [8]. Kessler [9] found a 7.8% lifetime prevalence of PTSD among the general population and a higher prevalence among the high-risk population. Medical staff

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Peer review under responsibility of Chinese Nursing Association.

http://dx.doi.org/10.1016/j.ijnss.2016.12.002

Please cite this article in press as: Tang L, et al., Prevalence and related factors of post-traumatic stress disorder among medical staff members exposed to H7N9 patients, International Journal of Nursing Sciences (2016), http://dx.doi.org/10.1016/j.ijnss.2016.12.002

members usually work in the front lines at times of epidemics and natural disasters, such as the severe acute respiratory syndrome (SARS) outbreak, earthquakes, and other fatal epidemics. Harsh environments, depressing settings, and workload pressure can even threaten the lives and impose psychological trauma on these workers and increase their sensitivity to PTSD. Ping Wu [10] evaluated the mental health of medical staff members who were involved in the SARS outbreak and found that about 10% of the respondents had experienced high levels of PTSD symptoms since the outbreak. Meanwhile, those respondents who had been isolated, worked in high-risk workplaces such as SARS wards, or had friends or close relatives who contacted SARS were two to three times more likely to develop high levels of PTSD symptoms than those who were not exposed to the virus. In conclusion, Ping Wu suggested further examinations and interventions on the mental health of medical staff members involved in the SARS outbreak.

Several studies have explored the development of PTSD symptoms during epidemics, such as SARS and H1N1. One study reported that probable PTSD cases were significantly more prevalent among older people and residents of SARS-affected regions, thereby indicating that age and degree of exposure could be treated as significant predictors of PTSD [11]. Another study reported the prevalence of PTSD, and they found that female gender, having H1N1 influenza, having family members, friends, or acquaintances with H1N1 virus, and feared of contracting the H1N1 virus were significant predictors of PTSD [12]. However, only few studies have investigated PTSD among doctors and nurses who have been exposed to H7N9 patients. Therefore, this study aims to provide information about the prevalence and related factors of PTSD symptoms among medical staff members who have been exposed to H7N9 patients during the H7N9 influenza epidemic as well as provide a basis for offering psychological guidance to these workers.

2. Aims

This study aimed to explore the level of PTSD symptoms, anxiety, and depression among medical staff members, including doctors, nurses, and interns, who were exposed to H7N9 patients. The relationship between these psychological distress symptoms and the characteristics of medical staff members, including their demographics, patient contact frequency, training, and related experience, was also explored.

3. Materials and methods

This study received ethical approval from the human research ethics board of the Wannan Medical College.

3.1. Samples and procedures

The medical staff workers in Anhui Province who were exposed to H7N9 patients were recruited through convenient sampling between January 2015 and May 2016. There were 3H7N9 patients admitted in there departments during that period. One was admitted in the respiratory department, one was admitted in the intensive care unit (ICU), and one was admitted in emergency department and was then transferred to the ICU two days later because of deterioration. Only those staff members who were working in departments admitting H7N9 patients, had frequent contact with these patients, had contact with their caregivers, worked in the front lines of their clinics, and participated voluntarily in this study were included in the final sample, while those staff members who were not actively working their jobs during the study period were excluded from the sample.

3.2. Measures

The participants were given a demographic information form that asked for their personal information (occupation, gender, age, professional title, and years of work experience), contact frequency with H7N9 patients, related training, and related experience. Afterward, the participants were asked to complete a self-reported questionnaire, the PTSD Checklist-Civilian Version (PCL-C), which was developed by an American PTSD research center following the Diagnostic and Statistical Manual of Mental Disorders-IV [13]. This scale includes 17 items for evaluating three clusters of PTSD symptoms, including intrusive symptoms (Criterion B l-5 title), avoidance symptoms (Criterion C 6—12 title), and hyper-arousal symptoms (Criterion D 13—17 title). The study supported the value of the PCL-C as a screening instrument for PTSD. The reliability and validity of this instrument had been proven in previous research [13,14]. The total PCL, intrusive, avoidance, and hyperarousal scores had Cronbach's alpha coefficients of 0.94, 0.85, 0.85, and 0.87, respectively, thereby indicating high internal consistency. The test retake correlation coefficients for the total PCL scores were 0.92 ($P < 0.001$) for immediate re-takers and 0.88 ($P < 0.001$) for participants with one-week retest intervals. The frequency of stress symptoms occurrence during the past four weeks was rated on a five-point scale ranging from 1 (not at all) to 5 (extremely). The total score ranged between 17 and 85, with a higher score indicating a higher chance for these patients to show PTSD symptoms. A previous study [15] suggested that the prevalence of PTSD symptoms could only be ascertained if the PCL-C scores were equal or greater than 38.

3.3. Investigation methods

The researchers explained the purpose and significance of the survey to the head nurses of each department. The participants voluntarily completed the scale. The researchers also explained to the participants that the survey results would be used exclusively for research purposes, that the information they would provide would not be leaked, and that they should provide their informed consent. The questionnaire can be completed anonymously between five and 6 min. We distributed 108 questionnaires, among which 102 valid questionnaires were returned, thereby resulting in a 94.44% response rate.

3.4. Statistical analysis

Statistical analysis was performed using SPSS 19.0 for Windows. The significance level was set at $P < 0.05$. The PTSD scores were expressed as mean ± SD. Independent sample t-tests were performed to compare two groups (gender, related training, and related experience) on normally distributed variables. One-way analysis of variance was performed to identify the variables that were independently and significantly associated with the PCL-C scores.

4. Results

A total of 102 medical staff members participated in this study, among which 26 were doctors, 62 were nurses, and 14 were interns. 20.59% of these staff members satisfied the symptomatic criteria for PTSD. Among the participants, 20 were from the respiratory department, 61 were from the ICU, and 21 were from the emergency department. In terms of training and experience, 63 had related experience in treating H7N9 patients, while 40 had received related training (Table 1). The mean total PCL-C score of the sample was 30.00 ± 9.95, and the scores ranged from 17 to 74. Among the

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