



Research paper

Changes in the levels of depressive symptoms and anxiety in Ansan city after the 2014 Sewol ferry disaster



Yang Hee Jung^a, Kim Gawon^a, Lee KangUk^b, Lee Jakyoun^c, Cheong Hae Kwan^d, Choi Bo Youl^e, Lee Soon Young^{a,*}

^a Department of Preventive Medicine and Public Health, Ajou University School of Medicine, Suwon, Korea

^b Department of Psychiatry, Kangwon National University School of Medicine, Chuncheon, Korea

^c Graduate School of Public Health, Ajou University, Suwon, Korea.

^d Department of Social and Preventive Medicine, Sungkyunkwan University School of Medicine, Suwon, Korea

^e Department of Preventive Medicine, College of Medicine, Hanyang University, Seoul, Korea.

ARTICLE INFO

Keywords:

Depression
Anxiety
Disaster
Community
Recovery

ABSTRACT

Background: In April 2014, a ferry carrying 476 passengers sunk on the coast of Korea, resulting in 304 deaths. Of these, 250 were local high school students, and the disaster significantly affected their community. This study aimed to examine the prevalence of depressive symptoms and anxiety among Ansan city residents to understand their recovery process after the accident.

Methods: Two cross-sectional surveys (survey 1, after 4–6 months and survey 2, after 16–18 months of disaster) were used to compare prevalence among residents of Ansan city and adjacent cities. Symptoms were determined by the Center for Epidemiologic Studies-Depression Scale and the Generalized Anxiety Disorder 7-item Scale.

Results: A total of 1,773 and 1,748 participants were included in Survey 1 and Survey 2, respectively. Survey 1 showed a significantly higher prevalence of depressive symptoms (19.0%; 95% confidence interval [CI], 16.9–21.1) and anxiety (6.1%; 95% CI, 5.0–7.5) among Ansan city, compared to participants from adjacent cities (depressive symptoms: 14.3%; 95% CI, 12.7–16.1; anxiety: 3.6%; 95% CI, 2.9–4.5). Survey 2 showed a decreased prevalence of depression (15.8%; 95% CI, 14.0–17.9) and anxiety (5.0%; 95% CI, 4.0–6.4) among Ansan city residents. Depressive symptoms and anxiety adjusted odds ratio in survey 2 compared with survey 1 were 0.74 (95% CI 0.62–0.89) and 0.81 (0.60–1.08) among Ansan city, respectively.

Limitations: Cross-sectional study design and lack of pre-disaster baseline data for comparison are limitations of this study.

Conclusions: Psychological distress occurred at a population level, not only among survivors and their families, but also among Ansan city residents indirectly impacted by the traumatic event. Although populations indirectly affected by a disaster show a natural recovery process, timely population-based interventions may be helpful.

1. Introduction

On April 16, 2014, a ferry known as the MV Sewol sunk in the southern area of the West Sea in Korea with 476 passengers on board (Park and Hancocks, 2015) (Fig. 1). This accident, known as the Sewol ferry disaster, caused 304 deaths, of which 250 were students from a high school in Gojan-dong of Ansan city. The media coverage of the rescue attempts greatly affected the public, and the Korean government announced that Ansan city, where most of the victims from the Sewol ferry disaster resided, was a special disaster zone.

The trauma from disasters can cause diverse psychopathological symptoms, ranging from psychiatric symptoms such as posttraumatic

stress disorder, depression, anxiety, and panic disorder, to disruptions of daily life caused by unspecified somatization symptoms, worsening of pre-existing health conditions, dependence on drugs, and sleep disorders (Norris et al., 2002). These trauma-related symptoms can occur not only among disaster victims and their families but also among people exposed to the media coverage of the disaster (Galea et al., 2002). For example, following the disaster involving the World Trade Centers (WTC) in the USA, several studies were performed to evaluate the psychopathological impact. Higher prevalence of various psychopathological symptoms were found to occur among those directly related to the disaster, such as the survivors, volunteers, eye witnesses, those living nearby to the disaster area (Galea et al., 2002), and

* Corresponding author.

E-mail address: solee@ajou.ac.kr (S.Y. Lee).

<https://doi.org/10.1016/j.jad.2018.07.066>

Received 7 November 2017; Received in revised form 16 June 2018; Accepted 22 July 2018

Available online 24 July 2018

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Fig. 1. The map of the Sewol ferry disaster area and the sampling locations of Ansan city and adjacent cities in South Korea.

residents in the state where the disaster occurred, compared with residents of other states (Kessler et al., 2008; Schlenger et al., 2002). Although the Sewol ferry disaster occurred in a remote location far from the community where the victims resided, and no physical damages to the community occurred, the residents' psychological response in Ansan city to the news of the accident and number of casualties was remarkable. In the two weeks after the disaster, 3900 people visited a public disaster mental health support center in Ansan, seeking psychological counseling. Of these, 92% did not have a direct connection to the accident, either as a survivor or as an acquaintance of a survivor (Lee, 2014). People were reluctant to go out of their homes, and the economy was stagnating (Woo et al., 2015). These findings indicate the necessity of studying the magnitude and extent of psychopathological impacts caused by a disaster at the larger community level, to predict any intangible harm and to provide appropriate interventions to communities affected by disaster.

In general, it has been reported that any population exposed to a disaster tends to experience volatile emotional responses within the first year of the disaster, and tends to have recovered by the anniversary of the event (Federal Emergency Management Agency (FEMA), 2013a). The recuperative power of communities differs according to the existing characteristics of the community, including infrastructure (Wind et al., 2011) and trust between residents (Otto et al., 2006). The recovery process can also be shortened and alleviated through appropriate interventions (Shen, 2002), and timely interventions protect survivors and their communities from eroded perceptions of belonging and expectations of support (Norris et al., 2008).

Since the Sewol ferry disaster, there have been efforts to restore the trauma-related mental health consequences among the affected communities. The Korean government created a special budget to implement a student mental health support center and an Ansan mental health trauma center. Experts published a "Guide to Mental Health for Loss and Mourning: National Mental Health Guidelines for Sewol Ferry Accident" to ensure psychological recovery (Korean Neuropsychiatric

Association, 2014), and many NGO-led healing spaces were established in Ansan city. However, the mental health of many residents continues to be affected by the disaster. In fact, a study showed that the prescription rate of antidepressants in Ansan city increased by 5.6% over the 2 years after the accident (Han et al., 2017). Along with post-traumatic stress disorder, depressive symptoms and anxiety are reported as the most frequently observed psychopathological symptoms following disasters (Spitzer et al., 2006; Wind et al., 2011). This study aimed to determine the prevalence of depressive symptoms and anxiety at the community level following the Sewol ferry disaster in Ansan city, and to examine changes in these prevalence as measured by annual surveys for 2 years after the disaster.

2. Methods

2.1. Study population

This study was based on the annual cross-sectional community health survey implemented by the Korea Center for Disease Control and Prevention (KCDC) since 2008. The Korean Community Health Survey (KCHS) establishes annual community health indices used to develop and evaluate public health and medical services in communities (Kang et al., 2015; Kim et al., 2012). Participants aged ≥ 19 years are randomly selected from the entire population each year using a multistage stratified cluster-sampling procedure and weighted according to gender and age to be statistically representative of the communities' populations. Most victims of the Sewol ferry disaster were students residing in Ansan city (Fig. 1), in particular in Gojan-dong where the high school was located (the administrative districts in Korea, in order of size, are province, city, and "dong"; Ansan city is made up of 15 "dongs" with Gojan-dong included as one of the survey "dongs"). The present study surveyed approximately 1800 adults aged ≥ 19 years in Ansan city, Gyeonggi province in the KCHS. In addition, to compare the areas that were not directly affected by the disaster, a survey was performed in

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