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Research paper

Exploring the risk factors of suicidal ideation among the seniors in Shandong, China: A path analysis

Dandan Ge[a], Long Sun[a,1], Chengchao Zhou[a,b,*], Yangyang Qian[a], Li Zhang[a], Alexis Medina[c]

[a] School of Public Health, Shandong University, Jinan 250012, China
[b] Collaborative Innovation Center of Social Risks Governance in Health, China
[c] Freeman Spogli Institute, Stanford University, Stanford, CA, USA

ABSTRACT

Background: Suicide is a global public health problem that has a significant negative influence on individuals, families and the society. The objective of this study is to explore the risk factors associated with suicidal ideation among the elderly in Shandong Province, China.

Method: A total of 3313 participants (60+) of Shandong Province, China were included in this study. Suicidal ideation was assessed by using questions from the NCS (National Comorbidity Survey). Multiple logistic regression analysis was performed to examine the factors associated with suicidal ideation. Path analysis was conducted to test the direct and indirect association between factors and suicidal ideation.

Results: The prevalence of suicidal ideation among the seniors in Shandong, China was 4.2%. Depression had the strongest direct (β=0.303, p-value < 0.05) and total effect (β=0.303), life satisfaction (β=−0.103, p-value < 0.05; β=−0.136, p-value < 0.05), economic status (β=−0.046, p-value < 0.05; β=−0.040, p-value < 0.05) had both direct and indirect impacts on suicidal ideation. Social support (β=−0.040, p-value < 0.05) had indirect influence on suicidal ideation. Depression was a mediator between life satisfaction, economic status, social support and suicidal ideation.

Limitations: The data used in this study was cross-sectional, and the relationship between identified factors and suicidal ideation cannot be interpreted as cause-effect.

Conclusions: Depression was the strongest influencing factor of suicidal ideation among the elderly, followed by life satisfaction, economic status. Active intervention measures focusing on the depression screening and treatment both in urban and rural communities should be taken to prevent suicide.

1. Introduction

In 2014, WHO issued its first suicide prevention report: *Preventing Suicide: a Global Imperative* that estimated about 800,000 people died from suicide in the world each year. Meanwhile, the report pointed out that suicide was the second leading cause of death in 15–29 year-olds around the world (WHO, 2014a). Suicide is a major public health issue in the worldwide, which places a huge economic, social and psychological burden on the individuals, families, communities and countries. The suicide rate was 7.8 per 100,000 people in China in 2012, which ranks second globally in the estimated number of suicides (WHO, 2014b) China is one of the countries with highest burden of suicide.

The WHO suicide prevention report indicates that suicide rate is highest among those aged 70 years and above for both men and women in almost all regions of the world (WHO, 2014b). Some previous studies conducted in China and other countries also indicate that the elderly has the highest suicide rate (Yip, 1996; Xu et al., 2000). China has the largest number of the older people in the world (MOH, 2014). At the end of 2015, 16.1% of the Chinese population (222 million) were aged 60 and above, and 10.5% of the population (143.8 million) were 65 years older and above (National Bureau of Statistic, 2015). Suicide among the seniors in China is one of the most important public health issues which we should address, as it may further result in more serious health problems and pose higher health burdens on the individuals and households. Therefore, to explore suicide and its associated factors among Chinese seniors is of high priority.

Suicidal ideation is an important part and inevitable stage of suicidal behavior which is an important risk factor for attempted and

* Corresponding author at: School of Public Health, Shandong University, 44 Wen-hua-xi Road, Jinan, Shandong 250012, China.
E-mail addresses: 1548632589@qq.com (D. Ge), sunlong@sdu.edu.cn (L. Sun), zhouchengchao@sdu.edu.cn (C. Zhou), 416426488@qq.com (Y. Qian), 85836536@qq.com (L. Zhang), amedina5@stanford.edu (A. Medina).
[1] Author contributes equally to this study and is a co-first author of the paper.

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completed suicide (Goldstein et al., 1991; Schwab et al., 1972). It is mainly shown as a clear will of suicide, not as a suicide plan or action (Xiao and Xu, 2005). To our best knowledge, there are a lot of studies exploring the risk factors of suicidal ideation (Garlow et al., 2008; Nock et al., 2008; Kessler, 2005). Among those risk factors for suicidal ideation, mental disorders are perhaps the most widely concerned and identified risk factors for suicidal ideation and attempt suicide (Nock et al., 2010; Tsoh et al., 2005) Further, some other risk factors such as chronic physical conditions, disability, traumatic experiences and poor social support can also contribute to suicidal ideation (Almeida et al., 2012; Bruffaerts et al., 2015; Xu et al., 2016). However, most of the studies mainly focused on college students and young adults. Only very few studies have explored the suicidal ideation and its risk factors among the seniors in China, but there is also a lack of the research to test the direct and indirect associations between risk factors and suicidal ideation among the elderly in China (Wu et al., 2013; Xu et al., 2016, Xu et al., 2015).

To remedy this situation, the present study aims to explore the risk factors associated with suicidal ideation among the elderly in China. To do so, we have following specific objectives. First, we will identify the prevalence of the suicidal ideation among the elderly in China. Second, we will compare the suicidal ideation across different groups of the participants. Finally, we will use path analysis to explore the direct and indirect association between risk factors and suicidal ideation among the seniors in China. This study will provide evidences for the suicide prevention in Chinese elderly.

2. Methods

2.1. Subjects

This study was conducted in Shandong province from November 2011 to January 2012. Shandong ranks the second in the number of the total population in China (National Bureau of Statistics of China, 2015). We employed a three-stage stratified random cluster sampling method to select participants. First, all of the districts and counties were categorized into three groups according to the GDP per capita in 2011. Then, from each group we randomly selected one district and one county. In total, three districts (Huaiyin, Dongchangfu, Zhangdian) and three counties (Qufu, Chiping, Leling) were selected as study sites. Likewise, three sub-districts and three townships then were selected from each sampling district and county according to their per capita GDP, respectively. Third, from each selected sub-district and township, we selected three communities or three villages. Finally, 27 urban communities and 27 rural villages were selected. In total, 3313 participants were included in this study.

2.2. Data collection

We collected the data from November 2011 to January 2012 by using a house-to-house interview. All the elderly were interviewed face-to-face in an isolated room in their houses using a structured questionnaire by trained postgraduate students from our university. To ensure quality, completed questionnaires were carefully checked by quality supervisors after the interview.

2.3. Measures

2.3.1. Social demographic characteristics

Social demographic characteristics included gender, age, education, marital status, living status and self-reported economic status. The age of the participants was grouped into three types: 60-, 70- and 80+ years. Other demographic characteristics were categorized as follows: gender (male vs. female), education level (illiteracy or semiliterate, primary school, junior school and senior school or above), residence (rural vs. urban), marital status (single vs. couple), and economic status (poor, normal and good).

2.3.2. Physical health

We collected the physical information about non-communicable chronic diseases (NCDs) of the participants in the past 6 month. NCDs were coded by “yes” into “1”and “no” into “0”.

2.3.3. Life satisfaction

Life satisfaction was measured by a question of “Are you basically satisfied with your life”. The answer included “yes” (1) and “no” (0).

2.3.4. Social support

We use the Social Support Rating Scale (SSRS) developed by Shuiyuan Xiao to measure the extent of social support, which is a ten-item including subjective support, objective support, and utilization of support (Xiao, 1994). The Cronbach's α of the scale in this study was 0.75.

2.3.5. Depression

This study applied Geriatric Depression Scale (GDS) short form which consists of 15 questions to evaluate the severity of depression. A total score over 5 was suggestive of depression, which was coded into 1. A total score of 5 and below was coded into 0, which was suggestive of non-depression (Smarr and Keefer, 2011). The Cronbach's α of the GDS in this study was 0.81.

2.3.6. Suicidal ideation

Suicidal ideation was assessed by using a question from the baseline NCS (National Comorbidity Survey) (Kessler et al., 1999). The respondents were asked about the lifetime occurrence of suicide ideation “Have you ever seriously thought about committing suicide”? If the answer was ‘yes’, suicide ideation was coded as ‘1’, and if the answer was ‘no’, suicide ideation was coded as ‘0’.

2.4. Statistical analysis

All statistical analyses were performed using SPSS 22.0 and Amos 21.0. Firstly, descriptive analyses were performed to describe the demographics. Secondly, univariate analysis was conducted to compare the prevalence of suicidal ideation across different subgroups of the participants. Thirdly, a multivariate logistic regression analysis was performed to determine the association of suicidal ideation and some variables selected through the univariate analysis. Finally, the identified factors associated with suicidal ideation were included in a path analysis model. The reported CIs were calculated at the 95% level and statistical significance was set at the 5% level.

2.5. Ethical consideration

The Ethical Committee of Shandong University School of Public Health approved the study protocol. The investigation was conducted after the informed consents of all participants were obtained.

3. Results

Of all respondents, about 4.2% (n=139) have endorsed suicidal ideation (See Table 1). The elderly who suffered from chronic diseases had a significantly higher prevalence of suicidal ideation (5.0%) than the counter part of the elderly (2.6%). 25.8% of the participants with depression had suicidal ideation, which is higher than those without depression (1.7%). The subjects with poor life satisfaction had a higher suicidal ideation rate (27.7%), when compared to those with good life satisfaction (3.0%). With regard to the social support, the subjects with lower score were more likely to experience suicidal ideation. The prevalence of suicidal ideation across different types of demographics were also shown in Table 1. There were statistical significant differ-