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ScienceDirect

Comprehensive Psychiatry 65 (2016) 24–31

COMPREHENSIVE PSYCHIATRY

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The effect of community stress and problems on psychopathology: A structural equation modeling study

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Abstract

This research aimed to estimate the effect of perceived social factors in the community stress and problems on the residents' psychopathology such as depression and suicidal behaviors.

Subjects of this study were the informants (N = 1618) in a psychological autopsy (PA) study with a case–control design. We interviewed two informants (a family member and a close friend) for 392 suicides and 416 living controls, which came from 16 rural counties randomly selected from three provinces of China.

Community stress and problems were measured by the WHO SUPRE-MISS scale. Depression was measured by CES-D scale, and suicidal behavior was assessed by NCS-R scale.

Multivariable liner and logistic regression models and the Structural Equation Modeling (SEM) were applied to probe the correlation of the depression and the suicidal behaviors with some major demographic variables as covariates.

It was found that community stress and problems were directly associated with rural Chinese residents' depression (Path coefficient = 0.127, $P < 0.001$). There was no direct correlation between community stress and problem and suicidal behaviors, but community stress and problem can affect suicidal behaviors indirectly through depression. The path coefficient between depression and suicidal behaviors was 0.975. The current study predicts a new research viewpoint, that is, the depression is the intermediate between community stress and problem and suicidal behaviors. It might be an effective route to prevent depression directly and suicidal behaviors indirectly by reducing the community stress and problems.

1. Introduction

Community has been studied by previous researchers as main factor to relate to people's physical and psychological wellbeing. However, the limited number of studies has been reported with conflicting findings. Wilson et al. [13] compared four contrasting neighborhoods for their residents' physical health, chronic conditions, and emotional distress in Canada by a cross-sectional study. Wilson found that neighborhoods with lower social economic status reported poorer physical health and more emotional distress [13]. In a previous study aimed to investigate the relation between community socio-economic and ethnic characteristics with depressive symptoms in a population based sample in the United States, Henderson et al. found that depression was inversely related to neighborhood score and individual income and education. However, neither neighborhood social-economic characteristics nor ethnic density was consistently related to depressive symptoms once individual socio-economic characteristics were controlled for (Henderson et al. [5]). A longitudinal study by Dalgard and Tambs investigated the relationship between urban environment and mental health in Norway with a 10 year period apart. With the five types of neighborhoods studied, researchers found that parallel with the improvement in social environment there was a significant improvement in mental health among those who continued to live in the same area, implying that the quality of a neighborhood has an impact on mental health [1]. Another longitudinal study conducted by Schootman et al. with US census data found that

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http://dx.doi.org/10.1016/j.comppsych.2015.09.008
0010-440X/

the location attributes studied with this design were not independent contributors to the incidence of depression in middle-aged urban African Americans [10]. Similar findings were reported in a cross-sectional study by Thomas et al. [11]. They studied trying to understand whether contextual measures of residential environment quality and geographical accessibility are associated with symptoms of common mental disorder. As a result, there was little evidence to suggest that residential quality or accessibility was associated with symptoms [11].

Inconsistent findings might be resulted from methodological flaws. Ecological fallacy, some false interpretation of aggregate-level data in individual-level terms, is likely to be found in some studies as reviewed [4]. Connecting the census data on such community characteristics as race, education, and income, etc. to individual incidence of depression may yields inaccurate conclusions, as the individuals sampled for the dependent variables may not represent the community characteristics [10,11]. On the other hand, using a subject's perception of the neighborhood characteristics allows the community variable to be at the same level and comparable to the subject's personal traits [13].

As to the suicide patterns, there are many differences between China and the west countries. The suicide rate in the rural earn is higher than the urban areas and the female suicide rate is higher than the male suicide rate in China. There are two suicidal peak age period in China, that is the young and middle-aged period (19–35 years old) and the old period (≥60 years old). Pesticides method was the first suicide methods in China. With the development of economic and social, the suicide rate of China has decreased rapidly in recent years. Just because of the particular suicide patterns in China, it is more meaningful to research relationship among community stress and problems, suicide and the residents' psychopathology.

This current study aims to further test the relationship between community stress and problems and the residents' psychopathology, using independent (perception of the community stress and problems) and the dependent variable. Because of the social and psychological impact of the community factors to individual health [2], the hypothesis is that community stress and problems are positively associated with the residents' psychopathology such as depression and suicide behaviors.

2. Methods

2.1. Research design and data collection

Data for the study were obtained from a large scale psychological autopsy (PA) study correlated of suicide in comparison with a group of community living controls. In the current study, the multi-stage random sampling method was used. As we all know, China is a large country and has vast territory, firstly three provinces (Liaoning, Hunan and Shandong provinces) were chosen according to the development level and their location in China, that is in north area of China, in middle area of China and in south area of China. Secondly, 16 rural counties from three provinces were randomly selected (6 from Liaoning, 5 from Hunan, and 5 from Shandong) in China. Liaoning is an industrial province in northeast China, Hunan is an agricultural province in south China, and Shandong is a province with prosperity in both industry and agriculture in middle China. This selection method ensured that the selected provinces are representative for the whole Chinese rural people.

The current study is a case–control study. The current study matches the case and control by main demographic variables. The case respondent information came from the reported data of CDC (Centers for Disease Control and Prevention) and hospital emergency department of county (Xian). When the case confirmed, the control respondent of case was chosen according to the following match principle: same gender, same location area, and similar age (±3 years). In the end, a total number of 392 suicide cases and 416 community living controls were recruited, and two informants were interviewed for each suicide case and living control person.

For each suicide and each control, we tried to interview two informants. To obtain some parallel data as from the suicide cases, we also used proxy information from the controls. However, we noticed that the type of informants rather than the number of informants used in psychological autopsy studies was an extremely important and complex consideration [7]. Each carefully selected informant was supposed to report reliable information about the specific characteristic, recognizing that it is likely no one informant has all the pertinent information.

Based on these considerations, we used the following three guidelines for the inclusion of informants: (1) Suicide informants were selected with recommendations from the village head and the village doctor, and control group informants were recommended by the control themselves and then randomly selected by the research team, as those individuals were most familiar with the subject's life and circumstances, who were available for, and consent to, in-person interviews. (2) Although target persons could be as young as 15 years of age, informants had to be 18 years of age or older. Characteristics of the informants for both suicides and controls were noted in a standardized fashion. (3) For both suicides and controls, informant #1 was always a parent or spouse, or another important family member, and informant #2 was always a friend, co-worker, or a neighbor. However, we tried to avoid husbands or wives and the in-laws of those married as much as possible if suicides triggered by family disputes. Interviewing these people could result in very biased reports, if marital infidelity and family oppression were possible causes of suicide. If informants #1 and #2 provided difference information, information integration was necessary. The principles of information integration in current study were as follows: (1) For the general demographic information, such as age, residence location, education level, marital status, etc. the information provided by informant #1 generally be used, because informant #1 was most familiar to the target person.