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Characteristics of Chinese Rural Young Suicides Who Did Not Have a Strong Intention to Die¹

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Abstract

Background—In exploration of the risk factors of the Chinese rural young suicide, previous researchers found low prevalence of mental problems, high degree of impulsivity, and great proportion of lethal pesticide consumption. It noticed that some of the young suicides in rural China did not intend to die from the suicidal behavior which was only instrumentally used for certain gains.

Aims—This study aims to look into the characteristics of those young suicides who did not really intend to die and compare them with those young suicides who had a strong intent to die.

Methods—Subjects were 386 suicides aged 15-34 years in the rural areas of three provinces in China. The data were obtained by psychological autopsy method. The degree of suicidal intent of the subjects was evaluated by the first 8 items of Beck's Suicide Intent Scale (SIS).

Results—It was found that those suicides who had a strong intent of death were more likely to have higher age, more years of education, live alone, and suffer mental disease. On the other hand, the low intent suicides were more likely to have pesticides at home and to be impulsive. In other words, pesticides and impulsivity killed some Chinese rural young men and women who did not really want to die by suicide.

Conclusion—Findings of the study may be translated into practical measures in suicide prevention in China as well as elsewhere in the world.

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Conflict of interest

All the authors declare that they have no conflicts of interest.

Keywords

suicidal intent; pesticide; impulsivity; mental disorder; China

Introduction

Patterns and rates of Chinese suicide are different from those in the Western societies in several prominent ways. Firstly, the Chinese female suicide rates are very close to those in males. Secondly, the rural suicide rates are much higher than that in cities. Thirdly, the suicides aged 15-34 years form a peak in the age distribution, although old age group (65+) is at a higher risk of suicide in China [1, 2]. In the past years, the Chinese suicide rates have been decreased [3], which is unexplained by Durkheimianism that modernization and economic prosperity in a society will lead to high suicide rates [4]. All of these imply that the Chinese rural young suicide may have some special characteristics.

In the Western countries, over 90% of the suicides can be diagnosed with at least one type of mental disorder [5-7]. However, only 40-70% of the Chinese suicides can be diagnosed with mental disorders [8]. Although it is also a risk factor of suicide in China [9], factors other than mental disorder may play an important role in the life of the Chinese who have died or attempt to die by suicide.

Self-poisoning by lethal pesticides is commonly used in acts of suicide in rural China [10]. Some studies have showed that the increased use of pesticides is associated with an increase in suicides [11, 12], and easy access to lethal pesticide is a significant risk factor for suicide [13]. Therefore, some studies have suggested that a ban of lethal pesticides in rural areas can be a method for suicide prevention [14]. These present that the pesticide availability prompt suicide more frequently.

Impulsivity is also a risk factor for suicide which has been identified in previous studies [15, 16]. Although we cannot classify all suicides into highly impulsive reason in China, about 50% of suicide attempters can be categorized as suicides with impulsivity [17]. It means that such a big group of suicides in China do not really think about suicide seriously.

As mentioned above, previous studies have found that the Chinese suicides have low prevalence of mental disorders, high degree of impulsivity, and great proportion of lethal pesticide usage. We may also speculate that some of the young suicides in rural China do not intend to die from the suicidal behavior which may be used only as an instrument to threat or gain.

Suicide intent, defined as the degree which the individual wish to die by suicide, is a strong predictor for suicide behavior [18]. The Beck's Suicide Intent Scale (SIS) is also an important instrument for suicide risk assessment [19]. For suicide attempters, previous studies have found that having a psychiatric diagnosis, hopelessness and suicidal ideation were associated with high-level suicide intent [20-22]. However, few studies discussed the association with high- or low-level suicide intent among completed suicides, especially in rural China.

This study aims to look into the characteristics of those young suicides who did not really intend to die and compare them with those young suicides who had a strong intent of death by suicide. It is helpful for us to understand characteristics of young suicides with low suicidal intent. It also can give us some direct evidences for suicide prevention and intervention.

1. Methods

Study sample and the design

Established psychological autopsy method was used to investigate the environmental and other factors of rural young suicides. We selected three provinces in China for the study. Liaoning is an industrial province located in Northeast China, Hunan is an agricultural province in the Central South China, and Shandong is a province with economic prosperity in both industry and agriculture that is located on the east coast of China mid-way between Liaoning and Hunan. Sixteen rural counties were randomly selected from the three provinces (6 from 44 rural counties in Liaoning, 5 from 87 rural counties in Hunan, and 5 from 91 rural counties in Shandong). There are about 12 million people in the 16 counties. In each of the 16 counties, a project coordinator from the county level Center for Disease Control and Prevention (CDC) monitored suicide occurrences. In each of the three provinces, a project director from the provincial CDC or the university the study was affiliated with received reports on suicide cases each month. Suicides aged 15-34 years were consecutively recruited from October 2005 through June 2008. After successful interviews with two informants for each suicide, a total of 386 valid suicide cases were entered for this study.

Information sources

For each suicide, we tried to interview two informants. However, we recognized that the type of informants rather than the number of informants used in psychological autopsy studies was an extremely important and complex consideration [23]. We selected the informants based on the context or environment (how people observe the target, e.g. home vs. non-home setting). This way, each informant was carefully selected to optimize the information available on each case so that home, work, family and non-family aspects were included in the data.

Based on the above 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, as those individuals were most familiar with the subject's life and circumstances, who were available for, and consented to, in-person interviews. However, we tried to avoid as much as possible husbands and the in-laws of those female 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. (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 were noted in some questions (i.e., most recent contact, number of contacts in the last month, frequency of contacts in the last year, number of years informant has known the target, relationships, and the informant's

impression of their familiarity with target). (3) For suicides, informant #1 was always a parent, spouse, or another important family member, and informant #2 was always a friend, co-worker, or a neighbor.

Interviewing procedures

Informants were first approached by the local health agency or the village administration by a personal visit. Upon their agreement on the written informed consent, the interview time was scheduled between two and six months after suicide incident. Each informant was interviewed separately by one trained interviewer, in a private place of a hospital/clinic or the informant's home. The average time for each interview was 2.5 hours.

Due to the fact that cases were deceased, blinding of raters to case status was not possible. Inter-rater reliability was established and maintained by limiting the principal data gathering role to the 24 trained clinical interviewers and by comparison of duplicate ratings of the interviewers on a regular basis. The same interviewers participated in data collection for the case samples, promoting inter-rater reliability across that study.

The study protocol was approved before the data collection by the IRBs of the US based university as well as the Research Ethical Committees of the collaborating universities. Informed consent was obtained from each of the proxy information interviewees.

Measures

The degree of suicide intent of the subjects was evaluated by Beck's Suicidal Intent Scale (SIS) [24]. There are two parts in this scale. The first part (items 1-8) accesses circumstantial evidence of intent, including precautions, planning and communications. It is considered as the scale's objective section. The second subjective part (items 9-15) addresses the attempters' expectations and perceptions. Each item is scored for the severity on 0-2. For psychological autopsy studies, the objective SIS (items 1-8) is often used. It has been evaluated by Beck and David among completed suicides and attempted suicides [25]. In this study, we also used the objective SIS to estimate the suicide intent. The Chinese version of objective SIS has sound reliability and validity which has been estimated in a previous study [26].

Predicting variables included gender, age, education years, ethnicity, marital status, occupation, family annual income, religious belief, pesticide availability at home, living alone, impulsivity and mental disorders.

The age of the sample ranged from 15 to 34 years with a mean of 26.83 and standard deviation of 6.33. Education level was measured by elementary, middle school, senior school/ technical school, college and master or above. As the college, master and above was in a small size, so we recoded into elementary (1), middle school (2), senior school or above (3). Ethnicity was measured by Han and others. The Chinese people are composed of 95% of the Han people, and all other 55 ethnic groups account for only 5% of the Chinese populations. As there were few being separated, widowed or divorced, marital status was dichotomized as "never married" and "ever married" with the latter including those who were currently married, divorced, separated, or widowed. Occupation was measured by

farmer, businessman, national staff, student, worker, rural doctor, teacher, housewife, unemployed and others. It was recoded to farming peasants, factory workers and others. The suicides' economic status in the village was measured by very good, good, average, poor and very poor. We recoded it into good (1), average (2) and poor (3). The religious belief was estimate by one question. It asked what religion the target person believed in, and the choices were Taoism, Muslim, Christianity, Buddhism, and others. This item also had a category for no belief. As there are little persons have a religious belief. We recoded into yes (have a religious belief) and no (not have a religious belief). Pesticide availability at home was assessed with a single item asking if any type of farming chemicals was stored at home. Living alone was measured by yes and no. Dysfunctional impulsivity was measured by Dickman Impulsivity Inventory (DII) [27], and the scale was translated and validated in Chinese samples prior to this current project [28].

The Chinese version of the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders (SCID) [29] was used to generate diagnoses of mental disorder for suicides. Diagnoses were made by the psychiatrists on each team in consensus meeting at which all responses from each informant were presented by the interviewers.

Integrating the information from different sources

There were two proxy interviews for each suicide case. The vast majority of the responses for the target person were the same or quite similar. For different responses pertaining to the target person, data were integrated with the following three principles. For demographic information, we basically relied on the answers by the informant who had the best access to the information. For example, a family member should be able to tell the target person's age and birth date more accurately than does a friend. Second, in estimating the psychological and cultural values of the target person, we used the higher score of the two informants' responses if they are different. Finally, to determine a diagnosis with the SCID, we selected the response representing a positive symptom, because the other informant may not have had an opportunity to observe the specific characteristic or behavior. These three guidelines were applied in integrating responses of suicide cases.

Statistical analysis

SPSS for Windows (version 21.0) was used for data analysis. T-tests or one-way ANOVA were used to compare the difference on categorical variables across groups. Pearson correlation was used to analysis the association between continuous variables and suicide intent. Liner regression was performed to examine the factors related to suicidal intent. The variables which are significant in the bivariate analysis were chosen as the independent variables. The thesis brings the categorical variable (education level) as dummy variables into the regression analysis model.

2. Results

2.1 Subjects

Demographic characteristics of the sample are presented in Table 1. A total of 386 respondents answered the question regarding suicide intent.

2.2 Distribution and single factor analysis of suicide intent

We compared the suicide intent among the social and psychological characteristics in Table 2. The result shows that there is a statistical difference with suicide intent on age ($p=0.003$), education level ($p=0.010$), pesticide availability and home ($p=0.011$), living alone ($p=0.057$), impulsivity ($p=0.000$) and mental disorder ($P=0.001$).

2.3 Liner regression analysis

The liner regression analyses of suicidal intent are shown in Table 3. Old age ($p=0.038$), high-level education ($p=0.048$), living alone ($p=0.042$), and mental disorders ($p=0.022$) are related to high suicide intent. Pesticide available at home ($p=0.013$) and impulsivity ($p=0.001$) are significantly associated with low suicide intent. The same results were also found in the backward regression.

3. Discussion

In this current study we have analyzed the socio-demographic and psychometric characteristics of the suicides with low-level suicide intent in comparison with those suicides of high-level intent. We employed the objective SIS scale to measure the suicide intent among the selected rural young suicides in China, and found that older age, high-level education, living alone, and mental disorders are related to high intent suicide. Pesticide available at home and impulsivity are significantly associated with low intent suicide. In other words, pesticides and impulsivity killed some Chinese rural young men and women who did not really want to die by suicide.

Easy access to pesticides is a risk factor for suicide in China and that has been evidenced in many previous studies [10]. Our findings have further indicated that easy access to pesticide can prompt suicide for those who did not really want to die. Also, without the immediate presence of the lethal farming chemical, those who intended to suicide would have time to think about it and may change his or her mind. Pesticide ingestion is a very common method which was used in Chinese suicides. Some investigations show that about 60% suicides were died by pesticide ingestion [30, 31]. So restricting access to pesticides may be a much effect method to prevent suicide in rural China.

Impulsivity is an important factor and can be a predictor for suicide which has been identified in many studies [32, 33]. In China, about 50% of suicide attempt can be categorized as impulsivity suicide [34]. In our study, the higher level of impulsivity is associated with low suicide intent which implies that many suicides in rural China do not really want to die but died because of impulsivity.

Many previous studies have found the association between high intent of suicide and mental disorders among suicide attempters [21, 22, 35]. The similar results were also found in this completed suicide data. It implies us that the mental disorder promotes suicide behavior and suicide intent. People who suffered from mental disorder were afflictive, and they may try to find some ways like suicide to escape from this agony. They may have strong intent to die and tend to use suicide as an instrument to avoid pain from mental disorder.

Living alone may be another factor related to suicide with high intent. Somebody who lived alone was in the lack of communication with others. Communication is a protectable factor for suicide intent which has been illustrated in some previous studies [36, 37], and suicides who lived alone may have high-level intent to be dying because of lack of communications.

Low education has been shown to be a risk for suicidal behavior especially in younger populations [38, 39]. The current study indicated that high-level education was related to high intent of suicide among the suicides. So it showed that the low-level education may promote suicide behavior. However, the high-level education may promote suicide intent. Well educated people may consider and calculated things more carefully than low educated individuals, and they would have more intent to suicide when they have decided to suicide.

We also found that the older age was associated with higher suicide intent. We cannot conclude that old age was a risk factor for suicide intent because of the small range of age in our study. However, a study in rural China has illustrated that younger age individuals were more likely to carry out the low-planned suicide [40]. It implies that the old age may be a risk factor for suicide intent. Because the suicide plan as a part of suicide intent, the low-planned suicide was positively associated with suicide intent.

This study showed that the pesticides availability at home and impulsivity killed some Chinese rural young men and women who did not really want to die by suicide. A similar result that there were several differences between suicide and undetermined intent (foremost unintentional poisonings) were also found in Sweden [41]. Recently, some studies have paid attention to the misclassification of underdetermined poisonings deaths [42, 43]. A new death classification about the suicide and undetermined intent may be helpful for us to better understand suicide behavior.

There is a well-known limitation for the psychological autopsy method we have used for data collection in this study. As data were obtained from the proxy informants, errors and biases can be problems for the truth of the data. For example, mental disorders diagnosed with SCID without the presence of the target person may not be as accurate as a face-to-face interview between the patient and the psychiatrist.

Despite these limitations, this study has provided much information about the Chinese rural young suicides in terms of their intent to die. The major finding that some of the suicides with low-intent of death could have survived otherwise is critical and may be translated into practical measures in suicide prevention in China as well as elsewhere in the world.

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The US NIMH funded this project but had no role in study design, data collection, data analyses, data interpretation, or the writing of the paper.

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Highlights

1. This study was based on a big sample about suicide victims (386 cases) in rural China;
2. This study addressed the characteristics of young suicides with low intention to die as compared with those with high intention;
3. This finding may be translated into practical measures in suicide prevention in China.

Table 1

Description of the sample (N=386)

Variables		Mean±SD/n(%)
Gender	Male	211 (54.7)
Age	-	26.83±6.33
Education level	Elementary	166 (43.0)
	Middle School	184 (47.7)
	Senior School and above	36 (9.3)
Ethnicity	Han	352 (91.2)
Marital status	Never married	160 (41.5)
Occupation	Farming peasants	198 (51.3)
	Factory workers	108 (28.0)
	Others	80 (20.7)
Economic status in the village	Good	32 (8.3)
	Average	161 (41.7)
	Poor	193 (50.0)
Religious belief	Yes	30 (7.8)
Pesticide available at home	Yes	292 (75.6)
Living alone	Yes	33 (8.5)
Impulsivity	-	14.03±5.14
Mental disorder	Yes	184 (47.7)
All	-	386 (100.0)

Table 2

Comparing the suicide intent among social and psychological characteristics (N=386)

Variable	Suicide intent		
	Mean±SD	t/F	p
Categorical variable			
Gender		0.738	0.461
Male	8.37±3.36		
Female	8.12±3.24		
Education level		4.697	0.010
Elementary	7.67±3.29		
Middle school	8.69±3.23		
Senior school or above	8.75±3.43		
Ethnicity		-1.563	0.119
Hans	8.34±3.30		
Others	7.41±3.30		
Marital status		-1.441	0.150
Ever married	7.97±3.09		
Never married	8.46±3.44		
Occupation		0.173	0.841
Farming peasants	8.16±3.35		
Factory workers	8.33±3.16		
Others	8.39±3.42		
Economic status in the village		0.837	0.434
Good	8.50±3.04		
Average	8.00±3.41		
Poor	8.43±3.26		
Religious belief		0.995	0.320
Yes	8.83±3.67		
No	8.21±3.27		
Pesticide available at home		-2.561	0.011
Yes	8.01±3.31		
No	9.01±3.20		
Living alone		1.908	0.057
Yes	9.30±3.50		
No	8.16±3.28		
Mental disorder		3.464	0.001
Yes	8.86±3.33		
No	7.71±3.19		
Continuous variable	Mean±SD	r	p
Age	8.26±3.31	0.151	0.003
Impulsivity	8.26±3.31	-0.199	0.000

Table 3

Liner regression of suicide intent on the relevant predictors (N=386)

Variables	β	95% CI	p
Age	0.055	0.003, 0.108	0.038 [#]
Education level (reference=senior school or above)			
Elementary	-1.161	-2.311, -0.010	0.048 [#]
Middle school	0.001	-1.134, 1.137	0.998
Pesticide available at home	-0.932	-1.668, -0.196	0.013 [#]
Living alone	1.175	0.045, 2.305	0.042 [#]
Impulsivity	-0.102	-0.165, -0.040	0.001 [#]
Mental disorder	0.772	0.111, 1.433	0.022 [#]
Constant	8.942		0.000 [#]
Adjust R ² =0.104			

Note:

CI: Confidence Interval.

[#]: Significant in a backward multiple regression;