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Culture, risk factors and suicide in rural China: a psychological autopsy case control study

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Abstract

Objective—Previous research on sociocultural factors for Chinese suicide have been basically limited to single case studies or qualitative research with ethnographic methodology. The current study examines the major risk factors and some cultural uniqueness related to Chinese rural suicide using a quantitative design.

Method—This is a case control study with 66 completed suicides and 66 living controls obtained from psychological autopsy interviews in rural China.

Results—Both bivariate analyses and the multiple regression model have found that the Chinese rural suicide patterns are basically similar to those in most other cultures in the world: strong predictors of rural Chinese suicide are the psychopathological, psychological, and physical health variables, followed by social support and negative and stressful life events. Other significant correlates include lower education, poverty, religion, and family disputes.

Conclusion—Culture has an important impact on suicide patterns in a society.

Keywords

suicide; culture; China; risk factors; religion; family; psychological autopsy

Introduction

In China, the official report of suicide rate is 22.2 per 100 000 populations (1). Despite the availability of official figures, reported estimates of China's suicide rate vary over a wide range. For example, a 1995 World Mental Health Report put the overall suicide rate in China at 17.1 (2). A study by Phillips and Liu (3) reported a rate as high as 28.7. Other research conducted at the Harvard School of Public Health reported 30.3 (4). In a most recent study, Phillips et al. (5) reported a mean annual suicide rate of 23 and a total of 287 000 suicide deaths per year, and suicide accounts for 3.6% of all deaths in China and is the fifth most important cause of death in China. As the average of suicide rates in the world is 10.7, estimates of Chinese suicides are comparatively high (6).

Contrary to the common belief that urbanization is harmful for mental health and suicide rates (7,8), rural people in China have completed much more suicides (5,9–12). The rural rate in

China is nearly three or four times higher than the urban rate (5,13,39), and the difference remains true for both men and women, for all age groups, and over time (5). Although about 70% of the Chinese populations live in rural areas, they account for about 93% of suicides in the nation (3). Chinese rural suicide is an urgent focus of research for its risk factors and then prevention measures.

Phillips et al. (14) suggested eight significant predictors of Chinese suicide: high depression symptom score, previous suicide attempt, acute stress at time of death, low quality of life, high chronic stress, severer interpersonal conflict in the 2 day before death, a blood relative with previous suicidal behavior, and a friend or associate with previous suicidal behavior. Other researchers have suggested more explanations for the Chinese rural suicide in comparison with urban suicide: easy accessibility to lethal suicide methods in the countryside, less accessible medical or emergency care, and the relative deprivation in rural China (12,13). In the US for example, rural counties have a suicide rate higher than urban counties, and Wilkinson (15) argues that urban culture has come to the rural areas through TV, newspaper, and other media, and visits by kin of the deceased who have migrated to cities and brought about relative deprivation. This is likely to be true of today's Chinese rural culture. Further, kin are moving to urban areas to *dagong* (work) and having left relatives behind, and this erodes social support in concrete extended families (16).

In two recent anthropological and ethnographic studies, Pearson and Liu (17) and Liu (18) investigated the suicidal death of a Chinese rural young woman. Both studies focused on the sociocultural environments in which the suicide took place. Although depression is said to be commonly present in people who kill themselves in Western countries, this may not be the case in China (17). However, suicide may have a different meaning in the Chinese context, especially for women with an inferior status within the family. Suicide is taken as an act of revenge in a moral and spiritual sense, and the act of suicide grants the woman so much power that she may achieve what she could not during her lifetime (18). Obviously in China, the culture, rather than individual factors alone, must have played an important role in the rural suicide. Nevertheless, the risk factors, especially the culture specific life events in the family/marriage and religion domains that have led to rural Chinese suicide, have never been adequately investigated with rigorous methodology.

Aims of the study

The major aim of the study is to explore the risk factors and culture specific negative life events that are associated with Chinese rural suicide. We define culture as social values and norms shared by the people of a certain society in their daily life. It is hypothesized that certain cultural values and norms expressed in such social institutions as the family and religion in rural China play important roles in suicide, but differently from other societies in the world, although the major predictors of completed suicide are not quite different from what have been found in most other areas of the world.

Material and methods

Research design

Data for study are from psychological autopsy interviews in two rural counties around Dalian, Liaoning Province, China, between 2001 and 2002. Completed suicide cases were consecutively selected in Jinzhou and two townships in Zhuanghe. In Jinzhou, the public health personnel were approached to request the list of suicides in the district that had happened in the past one year. In Zhuanghe, the research team went to all the villages in the two selected townships, visited villagers, and identified recent suicides. From villagers and their cadres, more suicide cases within and out of the village were introduced to the researchers. Community

living controls were nominated by the local contact people in the same village or neighborhood that matched the suicide in gender and close in age. Sixty-six completed suicides that occurred within 1 year prior to the interview were sampled, with 66 age, gender, and location matched living individuals as the community control group. For each suicide case, there were two informants who were either next of kin or the best friend of the suicide. For each normal control, two informants and the control him/herself served as the sources of information. The interviews with the living normal control themselves provided a basis of validity tests. The total number of interviews was 330, and it took approximately six months and six interviewers to accomplish all the interviews. The response rate in the suicide case sample was 100%. Only two cases of 66 controls declined the interview, and replacements were made immediately. What accounts for the outstanding response rates is the Chinese culture that values conformity and respects authority. Each interview began with the reading and signing the consent form and the whole interview lasted about 2.5 h.

Instruments and measurements

There are three major domains of measurements: (1) demographic information, (2) social factors, and (3) psychiatric symptomatology and diagnoses. Demographic information includes the target persons' gender, age, marital status, education, and religion and religiosity. The instruments we used for social factors include Paykel's Interview for Recent Life Events (IRLE) (19) and Duke Social Support Index (DSSI) (20). On top of the 44 items in IRLE, we added 19 life event items based on our understanding of the Chinese rural culture, and the total number of life event items is 63. Of the 63 life events, eight are positive and the rest are negative or stressful events. We also asked the informants to name the top three events that had the strongest impact on the target person in the past one year. As to the psychiatric symptomatology and diagnoses, we used the Structured Clinical Interview for DSM-III-R (SCID) (21) and Hamilton Depression Rating Scale (HAM-D) (22). To assess psychiatric diagnoses, the major instrument is the SCID, which is the basis of mental illness diagnoses. Each diagnosis is made at a consensus meeting led by the licensed psychiatrists in the research team after the SCID data are in. The protocol is a structured questionnaire used in interviewing informants of suicides as well as controls. For all the Western developed instruments, translation and back translation were conducted multiple times to ensure the accuracy of each item in the interview. Recognizing that translations cannot always be perfect because of the differences in culture (23), the bilinguals on the research team met frequently for the disputed items in the translation until consensus was reached.

Validation of the translated scales

The major instruments translated into Chinese were tested for their reliability and validity and proved excellent or very good. As we used two informants for each case, inter-rater reliabilities are very important indication of the quality of interview data collection. Although all the interviewers were well-trained professionals and had been further trained in PA methods and using SCID, there is still a need to examine how consistent they were in rating a same diagnosis or response. For a detailed discussion on the validation of the method and instruments, please refer to the research team's recent publication on *The Journal of Nervous and Mental Disease* (25).

Data collection and statistical analyses

In order to obtain the maximum amount of information as well as to decrease recall bias about the case and selective recall or selective forgetting (24), we used two informants (a next of kin and colleague or neighbor) for each suicide case and two for each control plus the control him/herself. It pays off in several important ways. First, the questions left unanswered because of one informant's ignorance may be covered by information from another informant. They can

also be complementary on some uncertain issues. Secondly, with two informants answering questions from the same measurements about the same target person, accuracy of the information may be obtained for the items where the two answers match. When the two answers do not match, the positive one (for a dichotomous variable) or the higher value (in a continuous variable) is selected and entered into the database. Third, in the control group where the target person is also interviewed with the same protocol, the validity tests can be realized with the target's answers to certain issues (such as mental health and life events) as the criteria for the informants' answers. In other words, the validity of the informants' responses can be assessed by comparisons with the target person's responses. We used the latest version of SPSS in our statistical analyses, and the major statistics employed were *t*-tests, chi-squares, and multiple regressions.

Results

General characteristics of Chinese suicide

This case control study compares the 66 completed suicides and the 66 age, gender, and location matched living controls with data collected through psychological autopsy interviews. The major variables in comparison are shown in Table 1. Nominal measures were converted into dummy variables: Marital status (married = 1, all others = 0), employment (unemployed = 1, employed = 0), religion (yes = 1, all others = 0), belief in God (yes = 1, all others = 0), belief in afterlife (yes = 1, all others = 0), suicide (case = 1, control = 0).

The variation of timing of the 66 suicides is illustrated in Fig 1 and Fig 2, respectively for the month and the hour. The summer months witnessed more suicides than the winter months, and the suicides are more likely to happen during daytime than night.

Data for the mental status measured by the SCID were categorized into six major groups of axis I diagnoses as shown in Table 2. Each figure in the table is the number of positive diagnoses, and one case maybe positive on two or more categories. While 50 of the 66 suicides (76%) had at least one positive diagnosis, only nine out of the 66 living controls (14%) had at least one positive diagnosis ($\chi^2 = 51.5$, $P < 0.000$). Obviously, the suicides are more likely than the living controls to have the SCID diagnosed mental disorders.

Of the 55 negative and stressful life event items, the proxy subjects were asked to name three events that had the strongest impact on the target person in the past one year. Table 3 lists the top four most frequently claimed events for suicides and controls respectively. While the concerns of the controls focused on financial and health problems, the suicides were most bothered by interpersonal relations.

The direct means of suicide were rank ordered in Table 4, for males and females respectively. Pesticides or other poison is the most common means for both men and women, followed by hanging. The claimed causes of suicide are correlated with what we have found in the life event analyses: on top of the list of causes are family dispute, physical illness, and financial stress (see Table 5). Actually, family (18.2%), marital (9.1%), and dating problems (3.0%) account for over 30% of all the claimed causes of suicide, and this is specially true for women. Financial (12.1%) and poverty (10.6%) make up about 23% of all the claimed causes, and physical illness (18.2%) rank number three as the claimed cause. Although 76% of the 66 suicides were diagnosed with at least one account of mental disorder as above discussed, only 9.1% of the 66 suicides were claimed to be caused by mental illness.

Risk factors for suicide in comparison with matched controls

A logistic regression was performed on the studied variables for suicide. Table 6 shows the standardized and unstandardized regression coefficients with their significant levels. Some of

the variables that were significant on bivariate analyses with suicide have become non-significant in the multivariate regression because of the multi-linearity or moderation effects. However, with an R^2 of 0.51, the studied variables have explained over a half the variance of suicide in the samples. The standardized regression coefficients reveal that the most important independent variables are depression measured by HAMD, mental disorder, physical health, social support variables, and negative life events.

Discussion

This study builds on previous examinations of determinants of completed suicide in both Chinese and Western societies, and the independent variables were selected based on previous literature in both societies. We have been trying to identify the risk factors and Chinese-type negative life events that are associated with Chinese rural suicide, in comparison with what have been found in the West.

The bivariate analyses indicate that the majority of the variables in study distinguish the suicides from living controls, as illustrated in Table 1. As expected in many other societies, the suicides tend to be poor, less educated, and unemployed than the controls. The findings in social support basically sustained Durkheim's social integration theory of suicide. The Chinese rural suicides are more likely to occur during the summer months than in the winter season and daytime rather than night. These findings in time are in line with the patterns in other cultures as studied by Durkheim (7). Further, the suicides have more mental problems and had experienced more stressful and negative life events than the controls. Suicide patterns in rural China are generally similar to those found in Western societies but with some exceptions. It has been noted that the suicides are more likely than the controls to be religious and believing in afterlife. Also, although suicides were more likely to be widowed or divorced than the controls, the difference is not significant and the suicides and controls did not differ in the percentage of married people.

As in the West including the United States, the foremost predictor of suicidal behaviors is mental problems, and over 90% of suicides are associated with mental illness including alcohol and/or substance use disorders (26). However, our sample shows 76% of the Chinese suicides have been diagnosed with at least one axis I disorder. The diagnoses for the suicides may have been overestimated through the informants who may tend to exaggerate the symptom related events before the suicide occurred to help justify the consequence, and the response bias should be taken care of in the future study. Nonetheless, the occurrence of mental disorder among Chinese suicides found in the study is not as high as expected in the West. Further, depression was remeasured using HAMD, while the mean score for the suicides is 24.1 that for the controls is only 7.4. Basically, mental disorders including depression are important predictors of suicide in Chinese societies (40), although the Westerners are more likely than Chinese to experience mental illness prior to completed suicide. The rate of mental diseases among the Chinese suicides warrants more thorough investigations. Looking at the stressful life events that are associated with Chinese suicides may shed light on the situations in which most suicides have been completed.

Of the 55 negative and stressful life events, the mean number is 4.76 (SD = 3.3) for the suicides and 2.44 (SD = 2.00) for the controls ($t = 4.82$, $P < 0.001$). The top four stressful events for the suicides are loss of face, fight with spouse, fight within the family, and decrease of income, while the top four for the controls are decrease in income, life threatening illness in the family, a family member dead, and loss of job. Generally, the concerns of the controls focus on financial and health problems, and the suicides are most bothered by interpersonal relations.

The importance of loss of face, as expressed in *diu mianzi* in Chinese language, and its damaging impact on one's daily life are Chinese culture specific. When something socially unexpected or embarrassing has happened to someone with self-esteem and become known by people around, the individual's face is considered to be lost. The sense of self-image and protection of self-image also exist in the Western cultures, but people in very few of these other cultures take loss of face as much serious as Chinese do. To some Chinese people, *mianzi*, protection of the face is equivalent to protection of their life.

Family dispute (fighting with spouse or another family member) is also a major event prior to many cases of Chinese rural suicide, especially of the rural females (see Table 3 and Table 5). In an in-depth investigation of the Chinese family collectivism in comparison with the American society collectivism, we found that Chinese are very 'collectivistic' within the family relationship and family clans, while they are more 'individualistic' than Americans at the community and society levels (27). As reported earlier (28), the majority of suicidal reasons or triggers for the Chinese suicides were related to family, marriage, and romance issues. This is particularly true for rural young women. Because of the social importance of family collectivism, Chinese women, especially the rural young women, are basically confined to a limited arena of social life. They also depend too much on the resources provided by the family, and therefore, when something goes wrong in the family, marriage, or romance, they are less able to reach out for help. For many, they have nothing but the family, and if the family dumps them, there is no way out.

This explanation of Chinese suicide was supported by other researchers of Chinese suicide. Xie and Song (29) studied 260 suicides completed by rural young women in China and reported that the majority of the suicides were related to family conflicts: 121 or 47% being confrontation between husband and wife and wife abuse, 33 or 13% about arranged marriage and low status of women, and 79 or 30% about in-laws, chastity, status in the family, and face problems (p. 33). While 238 or 92% of the 260 consecutively sampled rural female suicides from 24 Chinese provinces in 1997 were aged between 15 and 34, 178 or 68% of them were reported married. About 82% of them used pesticide to kill themselves and 51% of them were reported to have acted out of impulsivity (p. 5). In their study, there has been no report on mental disorders related to suicide, and the social and cultural factors have been the foci of discussions throughout.

While religion or religiosity is generally a buffer of suicide in the world, in some cultures, suicide is morally acceptable under particular circumstances. Among Buddhist monks for example, self-sacrifice for religious reasons can be viewed as honorable act. In certain occasions, Buddhist monks set themselves on fire in protest (30). In Japan, attitudes toward suicide sometimes glorify suicide when done for 'good' reasons for controlling one's own destiny (31), and hara-kiri was a traditional suicide completed by warriors in the feudal era (32). The Hindu code of conduct condones suicide for incurable diseases or great misfortune (33), and it is acceptable for a widow to burn herself on her husband's funeral pyre in order to remain connected to her husband in their subsequent rebirth rather than to become an outcast in society (34). In these cultures, suicide is positively correlated with religion. In the less religious Chinese societies, attitudes toward suicide are mixed. Although Confucian doctrine appears to disallow suicide in that it deplores damaging one's physical appearance, it allows suicide as an expression of high moral or emotional pretest. If a person drowns or burns himself completely and thus disappears, it does not affront the Confucian concept (35). Buddhism, Taoism, and Confucianism, as foundation of traditional Chinese culture, are different from Western religions in terms of supernatural being, afterlife, rituals, and organization. In the Chinese religions, there is no a single God to worship, there is no afterlife in the Western sense, and there is lack of social support system and coping mechanism as the religious people do not meet regularly. Different from all the mainstream religions in the West, Chinese religions are

often associated with superstition as the saying of *zongjiao mixin*. To some Chinese individuals, being religious is equivalent of being superstitious, and death is a solution of all the problems and beginning of a new life. The Buddhist and Taoist belief in metempsychoses indicates the rebirth of the soul at death in another body, either human or animal (36, p. 54). Based on this superstitious idea, the religious and uneducated Chinese tend to believe that the status of their previous life has formed the current status (rich, poor, healthy, or barren, etc.). If they accumulate good deeds in the current life, they will be rich and prestigious in the next life, and if otherwise, their souls will be in the body of an animal in the next life. A rural poor and uneducated young woman, religious and superstitious, is likely to think about starting a new life by ending this miserable one quickly.

In a society where religion is unpopular, going to church is unusual, and being religious is deviant as in modern China, what could be the relationship between religion (or religiosity) and suicidal behaviors? China has a population of about 1.3 billion, but only roughly 100 million of them (approximately 7.7%) are claimed to have faiths in Buddhism, Taoism, Islamism, Catholicism, and Christianity, to various extents (37). When the proportion of religious people is low as in China, there is the absence of a moral community, and there are not enough religious people around to echo or to multiply the message of the religion against deviant behaviors including suicide (38).

The multiple regression findings are compatible with previous research in the West, which suggests that depression and other mental disorders, lack of social support, and negative life events, etc. are important predictors of suicide. However, we find that many of the selected variables no longer have a significant effect on suicide ($P > 0.05$). In the multivariate model that accounts for 51% of the variance in Chinese suicide, remaining strong predictors are the psychopathological, psychological, and physical health variables, followed by social support and life events. Thus, the Chinese rural suicide patterns are basically similar to those in most other cultures in the world. What form the striking differences are in the Chinese culture, especially in the areas of family, religion, and *mianzi* values.

This case control study with psychological autopsy method is one of the first conducted in China. One limitation of the study is the way to treat discrepancies in the responses offered by the two informants. As discussed in earlier, when the two answers did not match, the positive one (for a dichotomous variable) or the higher value (in a continuous variable) was selected for analyses. This procedure might have led to overestimations of certain realities, such as psychiatric symptoms. In our future study, we may have to consider interviewing a third informant wherever discrepancies in the original two arise. Another limitation of the study maybe in the sample size of 66 suicide cases and 66 living controls, which is considered to be small for more comprehensive analyses that require large power of analyses. We are not able to compare gender differences for most variables because of the small sample size. Based on this preliminary and pilot study of the Chinese suicide correlates, future full-blown studies with larger samples should further and more rigorously examine the risk factors of suicide particularly to Chinese populations.

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Fig. 1.
The month distribution of the 66 suicides in 2000 and 2001

Fig. 2.
The hour distribution of the 66 suicides

Table 1
Characteristics of the suicides in comparison with the controls

	Suicide (<i>n</i> = 66)	Control (<i>n</i> = 66)	<i>P</i> -value
Gender [<i>n</i> (%)]	48 (72.7)	48 (72.7)	NA
Age [mean years (SD)]	45.5 (17.1)	44.9 (16.7)	0.841
Marital status [no. of married (%)]	43 (65.2)	53 (80.3)	0.081
Education [mean years (SD)]	5.6 (2.6)	7.4 (3.8)	0.002 **
Family Annual Income [mean RMB (SD)]	7503 (11 197.9)	12 076 (11 434.3)	0.022 *
Employment [no. of unemployed (%)]	22 (33.3)	17 (25.8)	0.340
Physical health [mean (SD)]	3.59 (1.3)	3.77 (1.0)	0.373
Mental disorder [no. of cases (%)]	50 (76)	8 (12)	0.000 ***
HAMD depression [mean score (SD)]	17.97 (12.5)	5.17 (8.1)	0.000 ***
Religion [<i>n</i> (%)]			
No religion	57 (86.4)	63 (95.5)	0.069
Belief in god	16 (24.2)	10 (15.2)	0.189
Belief in afterlife	12 (18.2)	3 (4.5)	0.014 **
Social support [mean (SD)]			
Interactive	7.14 (2.0)	8.71 (1.8)	0.000 ***
Perceived	13.93 (3.7)	17.77 (2.8)	0.000 ***
Instrumental	21.83 (2.5)	23.15 (1.2)	0.000 ***
Negative life events [mean no. of occurrences (SD)]	4.76 (3.3)	2.44 (2.0)	0.000 ***

Significant at

* 0.05

** 0.01

*** 0.000 levels.

Table 2

Mental status of the suicides in comparison with the controls: diagnosed axis I occurrences in each category for each group

	Suicide (<i>n</i> = 66)	Control (<i>n</i> = 66)	$\chi^2 P$ -value
Depression	32	3	0.000 ***
Alcohol abuse	10	4	0.090
Anxiety	10	1	0.017 **
Mood disorder	5	2	0.419
Schizophrenia	2	0	0.154
Eating disorder	0	1	0.315

Significant at

** 0.01

*** 0.000 levels.

Table 3

The top four life events prior to the suicidal death or the interview

Rank	Suicide (<i>n</i> = 66)	Control (<i>n</i> = 66)
1	Loss of face	Decrease of income
2	Fight with spouse	A family member being terminally ill
3	Fight with family member(s)	A family member dead
4	Decrease of income	Loss of job

Table 4

Direct means for the 66 suicides

Means	Total (<i>n</i> = 66) [occurrence (%)]	Male (<i>n</i> = 48) [occurrence (%)]	Female (<i>n</i> = 18) [occurrence (%)]
Pesticides/other poison	46 (70)	32 (67)	14 (78)
Hanging	15 (23)	12 (25)	3 (17)
Drowning	2 (3)	2 (4)	0 (0)
Others	3 (4)	2 (4)	1 (5)
Total	66 (100)	48 (100)	18 (100)

Table 5

Claimed causes of the 66 suicides

Cause	Total (n = 66) [occurrence (%)]	Male (n = 48) [occurrence (%)]	Female (n = 18) [occurrence (%)]
Family dispute	12 (18.2)	7 (15)	5 (28)
Physical illness	12 (18.2)	9 (19)	3 (17)
Financial distress	8 (12.1)	8 (17)	0 (0)
Other reasons	8 (12.1)	7 (15)	1 (5)
Poverty	7 (10.6)	5 (10)	2 (11)
Extramarital affairs	6 (9.1)	5 (10)	1 (6)
Mental illness	6 (9.1)	1 (2)	5 (28)
Unknown reasons	4 (6.1)	3 (6)	1 (5)
Disappointed love	2 (3.0)	2 (4)	0 (0)
Committed a crime	1 (1.5)	1 (2)	0 (0)
Total	66 (100)	48 (100)	18 (100)

Table 6
Suicide regressed on the selected independent variables

	Suicide
Gender (no. of males & %)	Case-control matched
Age (mean years)	Case-control matched
Marital status (no. of married & %)	−0.005 (−0.005)
Education (in mean years)	−0.015 (−0.002)
Family annual income (in mean RMB)	−0.040 (−0.000)
Employment (no. of unemployed & %)	−0.042 (−0.047)
Physical health	0.225 (0.097) **
Mental disorder (no. of cases & %)	0.266 (0.177) **
HAMD depression (mean score)	0.330 (0.011) **
Religion (<i>n</i> & %)	
No religion	0.003 (0.005)
Belief in god	−0.133 (−0.168)
Belief in afterlife	0.052 (0.082)
Social support	
Interactive	−0.209 (−0.047) **
Perceived	−0.170 (−0.023) *
Instrumental	−0.048 (−0.016)
Negative life events (mean no. of occurrences)	0.147 (0.025) *
Adjusted $R^2 = 0.51$	

Standardized regression coefficients are shown, with unstandardized coefficients in parentheses.

* $P < 0.05$

** $P < 0.01$.