Published in final edited form as:
J Nerv Ment Dis. 2011 June ; 199(6): 410–415. doi:10.1097/NMD.0b013e31821d3ac7.

Suicide Means Used by Chinese Rural Youths:

A Comparison Between Those With and Without Mental Disorders

Jie Zhang, PhD[*,†] and **Ziyao Li, MPH**[*,‡]

[*]Shandong University Center for Suicide Prevention Research, Shandong, China

[†]Department of Sociology, State University of New York College at Buffalo, Buffalo, New York

[‡]Shandong Center for Disease Control and Prevention, Shandong, China.

Abstract

Reports on Chinese rural youth suicide indicated patterns different from those of the West. Only about 30% to 70% young victims had had diagnoses of psychiatric illnesses, and more than 60% of them used pesticides as suicide means. To prevent suicides in rural China, it is important to know the choice of means by Chinese young suicide victims with and without mental disorders. Data on suicide cases in China's rural areas gathered from a big psychological autopsy study were studied for demographic characteristics, suicide methods, and the presence of mental disorders. The findings in the suicide victims with and without mental disorders showed significant differences in suicide method selecting. Victims with mental disorders tended to select violent methods compared with those without mental disorders (31.4% *vs*. 16.2%). Hanging is method more likely chosen by the mentally disordered victims (13.3%) than those without a mental disorder (7.8%). Mental status affects the means choice among the Chinese rural young suicide victims. Among them, the female victims without mental disorders tended to act on impulsivity and used non-violent means such as pesticide consumption for suicide. This study informs suicide prevention measures in both China and rest of the world.

Keywords

Suicide method; psychological autopsy; mental disorder; China

Suicide rates in China are among the highest in the world. In China, suicide is the fifth most important cause of death and the leading cause of death among 15- to 34-year-old young adults (Wang et al., 2008). The average death rate for suicide in China was 23 per 100,000 from 1990 to 2000, accounting for about 287,000 suicide deaths every year (Phillips et al., 2002a, 2002b).

Several unique findings on the pattern of suicide in China compared with other countries have been reported by empirical researchers in recent years. First, rural suicide rate is threefold to five-fold higher than the urban suicide rate (Phillips et al., 2002a; Yang et al., 2004; Yip et al., 2005). Second, women in China are more likely than men to commit suicide (Ji et al., 2001; Phillips et al., 2002a; Yip et al., 2005). Third, consistent with findings in the West, the highest suicide rate is in older adults among all age groups, but another special small peak occurs in the 15- to 34-year-old age group (Phillips et al., 2002a).

Send reprint requests to Jie Zhang, PhD, Department of Sociology, State University of New York College at Buffalo, 1300 Elmwood Avenue, Buffalo, NY 14222. zhangj@buffalostate.edu..

In the West, mental illness is a strong risk factor for suicide (Conwell et al., 1996; Harris and Barraclough, 1997; Robins et al., 1959; Zhang et al., 2004), and more than 90% of suicide cases in the West have died with a psychiatric diagnosis (American Psychiatric Association, 2003; Conwell et al., 1996; Mann et al., 2005). However, the percentage of psychiatric diagnoses among suicide victims in China is lower than in the West: about 70% or lower of the suicide victims in China have been found to have at least one such illness (Phillips et al., 2002a). Some studies indicated that suicide victims with or without mental disorders might be from two different populations (Zhang and Zhou, 2009). However, it is still not clear whether, and to what extent, suicide victims without diagnosed mental illness share characteristics in suicide means with those with diagnosed mental illness.

Psychological autopsy is one of the most valuable tools of research on completed suicide (Isomets, 2001), and it is proved reliable and valid for use in China (Zhang et al., 2003; Zhang and Norvilitis, 2002). In this study, we used a psychological autopsy study to examine the prevalence of mental disorders in rural Chinese people 15 to 34 years of age who committed suicide and to examine the possible relationship between selecting suicide means and mental disorders.

METHODS

Research Design

Three provinces in China were involved in this study: Liaoning, Hunan, and Shandong, which respectively presents industrial province in the northeast China, agricultural province in central South China, and economic prosperity in both industry and agriculture in the midway between Liaoning and Hunan, respectively. Sixteen rural counties were randomly selected from the three provinces. In each county, suicide victims from 15 to 34 years of age were consecutively enrolled in the study from October 2005 to June 2008, and a total of 392 suicide cases were entered into the study.

For our study, we trained all village doctors in the research areas briefly on topics including the study procedures and judging and reporting suicidal deaths to local centers for disease control and prevention (CDCs). The information of suicidal deaths gathered at the county CDCs were then forwarded on a monthly basis to the provincial CDC. For those suicidal deaths that were not recognized by any health agency, our mortality registry system allowed the village treasurers, who collect fees for each burial or cremation and grasp all the deaths in the village, to notify the county CDC. Whenever necessary, an investigation helped by the village board and villagers was conducted to ensure that no cases of suicide were missed or erroneously reported.

Instruments and Measurements

Measures used in this study include sociodemographic information, the Suicide Intent Scale (SIS), Dickman Impulsivity Inventory (DII), and the Chinese version of the Structured Clinical Interview for DSM-IV (SCID). The SIS is an assessment tool used to understand a patient's will to die to assess the severity of the suicide attempt. We used eight items (isolation, timing, precautions against discovery/intervention, acting to get help during attempt, final acts in anticipation of death, active preparation for attempt, suicide note, and overt communication of intent before the attempt) in this scale to evaluated the victim's suicide attempt. The 23-item DII was designed to assess the personality trait of impulsiveness. It includes two subscales: the Dysfunctional Impulsivity Scales and the Functional Impulsivity Scales. Dysfunctional Impulsivity is the tendency to act with relatively little forethought when this causes problems. Functional Impulsivity is the tendency to act with relatively little forethought when this is optimal. Four categories of

DSM-IV axis I diagnoses were covered: mood disorders, schizophrenia, and other psychotic disorders, substance use disorders, anxiety disorders, and other axis I disorders. The diagnoses were made by psychiatrists on each team in consensus meetings at which all responses from each informant were presented by the nonpsychiatrist interviewers. Multiple diagnoses were made if appropriate. Each instrument described previously was validated in our previous study (Zhou et al., 2006).

Quality Control and Ethics

Informants were first approached by the local health agency or the village administration through a personal visit. The interviews were scheduled upon the informants' agreement and provision of the written informed consent between 2 and 6 months after the suicide incident to minimize recall bias and to reduce the impact of acute grief on the interview. Each informant was interviewed separately by one interviewer in a private place of a hospital/clinic, the informant's home or the village committee office. The average time for each interview was 2.5 hours.

We interviewed two informants for each suicide victim. Those individuals who were most familiar with the subject's life and circumstances and were available and consented to participate in our study were interviewed by the research team. Characteristics of the informants were noted in a standardized fashion (*i.e.*, most recent contact, frequency of contacts in the last month and last year, number of years informant has known the target, the informant's relationship with the target, and the informant's impression of their familiarity with target persons). The first informant was always a parent, spouse, or another important family member, and the second informant was always a friend, co-worker, or neighbor. Although the target persons could be as young as 15 years of age, the informants had to be 18 or older. In addition, if marital infidelity and family oppression were possible causes of suicide, we tried to avoid recruiting informants associated with family disputes because interview of these people could result in biased reports.

All interviewers were mental health or public health professionals and were intensively trained for 2 weeks on the determination of means of death, psychological autopsy methods, and administration of the study instruments by US and Chinese experts before beginning data collection.

The informants were integrated using the following two guidelines: a) for demographic information (*i.e.*, age, sex, education, marital status, family annual income, personal annual income, and pesticide stored at home), we basically relied on the answers by the informant who had the best access to the information, and b) with regard to mental disorders, we recorded a symptom as present if it was endorsed by either informant because the other informant may not have had an opportunity to observe the specific characteristic or behavior.

This study was approved by the institutional review boards of State University of New York College at Buffalo; Central South University, Hunan; Provincial Center for Disease Prevention and Control, Liaoning; and Shandong University, Shandong. The research nature of the interview and the background of the research project were explicitly explained, and informed consent that details the rights of the interviewee was read and signed by both parties before each face-to-face interview. If distress was present during the interview and the participant wished to discontinue, the interview would be stopped, and another replacement informant would be chosen.

STATISTICAL ANALYSIS

Descriptive analyses, Pearson chi-square test, and Fisher exact test were carried out to describe and to compare mental disorder diagnoses by sex. Descriptive analyses, paired *t*-test, Mann-Whitney *U*-test, and chi-square test were used to compare demographic variables, suicide means, suicide ideation score, and personality trait of impulsiveness with and without mental disorders. Unconditional logistic regression models were used to describe the associations between choice for suicide means and variables such as mental disorders, marital status, age, and others.

Age was categorized into two groups: those aged from 15 to 24 years and those aged from 25 to 34 years. The family's annual income and the personal annual income in yuan (renminbi) were categorized into three groups: for family annual income, those with 10,000 yuan or less, those with 10,001 to 20,000 yuan, and those with 20,001 yuan or more and for personal annual income, those with 5,000 yuan or less, those with 5,001 to 10,000 yuan, and those with 10,001 yuan or higher (during the study period, the exchange rate was approximately seven yuan to one US dollar). The health condition was categorized into "poor," "OK," and "good," and marital status into "not currently married" and "currently married." Those who were never married, were divorced, were separated, or were widowed were categorized into the former, and the latter also included those who were currently married or involved in a living relationship. All statistical analyses were carried out using SPSS version 13.0.

RESULTS

Diagnoses of Mental Disorders

During the study period from October 2005 to June 2008, we interviewed proxy informants of 392 suicide victims. A total of 188 (48.0%) suicide victims met the criteria for a diagnosis of at least one current mental disorder. The most frequently diagnosed mental disorder category among the suicide victims with mental disorders was major depressive disorder (50.0%), followed by schizophrenia (21.2%), alcohol use disorder (12.2%), mood disorder not otherwise specified (11.2%), bipolar disorder (6.4%), and dysthymia (5.3%). Table 1 also illustrates the significant differences between men and women: the current prevalence of a) mental illness (118 [55.1%] *vs*. 70 [39.3%]; $p = 0.002$), b) major depressive disorder (61 [28.5%] *vs*. 33 [18.5%]; $p = 0.021$), c) dysthymia (9 [4.2%] *vs*. 1 [.6%]; $p = 0.025$), and d) alcohol use disorder (23 [10.7%] *vs*. 0 [0.0%]; $p = 0.000$).

Table 2 lists the sociodemographic characteristics of the suicide victims with and without mental disorder. Among the suicide victims, 118 (55.1%) of 214 men and 70 (39.3%) of 178 women met the diagnostic criteria for at least one mental disorder. Compared with the victims without mental disorders, the victims with mental disorders tended to be male and older and tended to have less family annual income and poor health conditions. However, there was no significant difference between these two groups in personal annual income, educational level and marital status.

Suicide Methods

The most common method by the suicide victims in this sample was pesticide ingestion, which claimed 260 cases or 66.3% of the group. The second most used method was hanging (41 cases or 10.5%), followed by ingestion of poison other than pesticides (27 cases or 6.9%) and drowning (20 cases or 5.1%; Table 3). Victims without mental disorders were more likely than those with mental disorders to die by ingesting a pesticide (148 [72.5%] *vs*. 112 [59.6%]; $p = 0.007$). We then divided all suicide means into violent and non-violent categories. The violent group ($n = 92$) includes hanging, drowning, jumping, wrist-cutting,

electronic, railway and others specified, whereas the nonviolent group (n = 300) includes overdose, gas, and ingestion of a pesticide or other poisons (Zhang and Xu, 2007). There were significant differences in suicide methods (violent versus nonviolent) between victims with and without mental disorders. Among all suicide victims, mental disorder was prevalent in 129 (43.0%) of the 300 who used the nonviolent method and in 59 (64.1%) of the 92 who used the violent method (Tables 3 and 4).

Suicide Methods and Mental Disorders

There were significant differences in suicide methods (nonviolent or violent) between the victims with and without mental disorders (Tables 3 and 4). Victims with mental disorders were more likely than those without mental disorders to kill themselves using a violent method (31.4% *vs*. 16.2%). The victims without a mental disorder are more likely than those with a mental disorder to act on the urge, and this is true of both functional and dysfunctional impulsivity. On the other hand, those with mental disorders had stronger intent to kill themselves than those without a mental disorder.

Figures 1 and 2 present the association between diagnoses characteristic of victims and the suicide method. Victims without mental disorders were more likely to kill themselves using nonviolent methods, especially ingesting a pesticide, whereas the victims with mental disorders were more likely than those without mental disorders to select violent methods such as hanging, drowning, jumping, and others.

Multiple Regressions

Multiple logistic regressions were practiced separately for the male and female victims. Included in the models were mental disorders, marital status, age, pesticide stored at home, and personal annual income. Those variables were hypothesized to have an influence on the victim to choose either the nonviolent or violent method to kill themselves. As shown in Table 5, although marital status and age were both variables that influenced the victims to choose a violent or nonviolent method, they function differently for male and female suicide victims. For men, being married increased the odds of choosing a violent method by 2.44 times, whereas being younger was a protective factor and increased the odds of violent choice by.28. On the other hand, married women were less likely to choose a violent method (odds ratio [OR] = 0.23), and being older was a risk factor and increases the odds of violent method choice by 4.03 times. Victims with a diagnosed mental disorder were more likely to choose a violent method to kill themselves, and it is true for both male (OR = 2.43) and female (OR = 6.85) victims. Men and women with pesticides stored at home were more likely to kill themselves using a nonviolent method, such as ingesting pesticides. Finally, for the men, the higher personal their annual income is, the more likely that they will choose a violent method (OR = 2.00).

DISCUSSION

In this national psychological autopsy study, we used a consecutive sampling with a sufficient sample to enroll suicide victims in 16 randomly selected counties in three provinces in China. For each suicide case, we interviewed two informants to get an accurate understanding of the victim before his/her death. Because China does not have a comprehensive vital reporting system yet, we relied on village doctors and local CDC to identify eligible cases. We trained village doctors to determine the type of death. The village head or village treasurer with additional information helped minimize false classifications or missed suicide cases. We identified 392 suicide cases over the 2.5-year study period.

It is found in this study that the overall current prevalence of mental disorder among the rural young suicide victims in China (48.0%) is lower than those found in the Western countries, where over 90% of all suicide victims can be found to have a mental disease (Conwell et al., 1996). As noted earlier, the low prevalence of mental disorders has also been noticed in previous studies (Wang et al., 2008). In Chinese societies, other risk factors, such as interpersonal relations, family and marital relations, economy, and psychological strains, may play a more important role in the suicide occurrences (Zhang, 2010).

The current prevalence of mental illness among female suicide victims was lower than in male victims (39.3% *vs*. 55.1%, respectively). It is also true for major depressive disorder (18.5% *vs*. 28.5%) and alcohol use disorder (0.0% *vs*. 10.7%), whereas schizophrenia was higher for women than for men (12.9% *vs*. 7.9%). In a study with a larger sample (N = 12,391), Chen et al. (2009a) reported a prevalence of current schizophrenia of 5.7% and a prevalence of major depressive disorder of 7.2% in Taiwan. In another nationally representative psychological autopsy study (N = 519), Phillips et al. (2002b) reported that 40% of suicide victims had depression, and 7% had alcohol dependence. Our primary explanations for this situation are our rural source of information, which had different cultural backgrounds and sociodemographic characteristics (Zhang et al., 2009; Zhang and Zhou, 2009). The comorbidity rate of mental illness in our study was lower than in a large study (N = 23,477; Hunt et al., 2010), which had a comorbidity rate of 54.0%. The reason for this discrepancy would be the different rates used in the two studies; in our study, we used the present rate when suicide occurred, whereas in Hunt's study, the rate used was calculated during 12 months before death. It seemed more accurate to use the present rate to describe the influence under the mental illness. One interesting finding was that, among our suicide victims and especially in among the women, those with major depressive disorder or schizophrenia were more likely to kill themselves using violent means. Violent suicide methods include the use of firearms, hanging, cutting, other forms of strangulation, jumping from a height or into traffic, motor vehicle accidents, drowning, and electrocution (Denning et al., 2000; Dumais et al., 2005). Nonviolent methods include ingestion of a lethal dose of drugs, ingestion of poison, and asphyxiation by gases. Firearms or jumping into traffic were a rare method of self-destruction in rural China. In comparison with violent methods, the nonviolent methods are considered to better preserve the body with less physical injuries.

In England and Wales, the most common methods of suicide were hanging (38.6%) and self-poisoning (25.9%; Hunt et al., 2010), and the results were comparable with previous studies including those conducted in Korea, Sweden, and the United States (Chen et al., 2009b). However, we have found in our study that there were 299 (76.3%) of 392 victims who used self-poisoning, which was more likely chosen by women and by those without mental disorders.

In our study, Chinese rural young suicide victims both with and without mental disorders were more likely to kill themselves using a nonviolent method (68.6% and 83.8%, respectively), whereas those deceased by violent manner were more seen with at least one kind of mental illness. The result is consistent with Zhang's report but with 66 suicide cases and in all age groups (Zhang and Zhou, 2009).

Previous studies indicated that mental disorders are not as important a risk factor for Chinese suicide victims as they are for suicide victims in other observed areas of the world (Zhang et al., 2004, 2009; Zhang and Zhou, 2009). In this current study, only 48.0% of suicide victims were associated with mental illnesses, which was much lower than in the West (American Psychiatric Association, 2003; Conwell et al., 1996; Mann et al., 2005). These numeric observations may indicate that factors other than mental health also play important roles in suicide in the world (Zhang et al., 2009).

This study identified different means of suicide by Chinese rural young victims with and without mental disorders. One reason for those mentally ill victims to choose a more violent means to kill themselves may be that they were more determined to die with the strained situation coupled with the torture from the mental illness. The finding has important implications for different intervention strategies that should be carried out in persons with and without mental disorders. For young rural women without mental illness, it is important to strengthen coping skills training.

LIMITATIONS

One of the limitations of this study was the methodological concerns in a psychological autopsy study. Through our strategy of scheduling interviews with proxy informants for suicide victims 2 to 6 months after suicide to reduce the potential impact of bereavement and stigma against suicide and mental illness on reporting, the risk of recall bias could be increased.

Second, the sample size of the nonviolent group was about 3 times larger than that of the violent group. The total number of victims who used a violent method was too small for a detailed examination of the association between suicide and certain categories of mental disorders. Our suggestion for future studies would be to prolong the study period and enroll more available cases.

Acknowledgments

This research was supported by the United States National Institute of Mental Health (NIMH) Grant R01 MH68560.

REFERENCES

American Psychiatric Association. [January 3, 2011] Practice guideline for the assessment and treatment of patients with suicidal behaviors.. American Psychiatric Association. 2003. Available at: http://www.psychiatryonline.com/pracGuide/pracGuideTopic_14.aspx.

Chen Y, Lee M, Chang C, Liao S. Methods of suicide in different psychiatric diagnostic groups. J Affect Disord. 2009a; 118:196–200. [PubMed: 19515427]

Chen Y, Park N, Lu T. Suicide methods used by women in Korea, Sweden, Taiwan and the United States. J Formos Med Assoc. 2009b; 108:452–460. [PubMed: 19515625]

Conwell Y, Duberstein P, Cox C, Herrmann J, Forbes N, Caine E. Relationships of age and axis I diagnoses in victims of completed suicide: A psychological autopsy study. Am J Psychiatry. 1996; 153:1001–1008. [PubMed: 8678167]

Denning D, Conwell Y, King D, Cox C. Method choice, intent, and gender in completed suicide. Suicide Life-Threat Behav. 2000; 30:282. [PubMed: 11079640]

Dumais A, Lesage A, Lalovic A, Seguin M, Tousignant M, Chawky N, Turecki G. Is violent method of suicide a behavioral marker of lifetime aggression? Am J Psychiatry. 2005; 162:1375–1378. [PubMed: 15994723]

Harris E, Barraclough B. Suicide as an outcome for mental disorders. A meta-analysis. Br J Psychiatry. 1997; 170:205–228. [PubMed: 9229027]

Hunt IM, Swinson N, Palmer B, Turnbull P, Cooper J, While D, Windfuhr K, Shaw J, Appleby L, Kapur N. Method of suicide in the mentally ill: A national clinical survey. Suicide Life-Threat Behav. 2010; 40:22–34. [PubMed: 20170259]

Isomets E. Psychological autopsy studies—a review. Eur Psychiatry. 2001; 16:379–385. [PubMed: 11728849]

Ji J, Kleinman A, Becker AE. Suicide in contemporary China: A review of China's distinctive suicide demographics in their sociocultural context. Harv Rev Psychiatry. 2001; 9:1–12. [PubMed: 11159928]

Mann JJ, Apter A, Bertolote J, Beautrais A, Currier D, Haas A, Hegerl U, Lonnqvist J, Malone K, Marusic A, Mehlum L, Patton G, Phillips M, Rutz W, Rihmer Z, Schmidtke A, Shaffer D, Silverman M, Takahashi Y, Varnik A, Wasserman D, Yip P, Hendin H. Suicide prevention strategies: A systematic review. JAMA. 2005; 294:2064–2074. [PubMed: 16249421]

Phillips MR, Li X, Zhang Y. Suicide rates in China, 1995-99. Lancet. 2002a; 359:835–840. [PubMed: 11897283]

Phillips MR, Yang G, Zhang Y, Wang L, Ji H, Zhou M. Risk factors for suicide in China: A national case-control psychological autopsy study. Lancet. 2002b; 360:1728–1736. [PubMed: 12480425]

Robins E, Murphy GE, Wilkinson RH Jr, Gassner S, Kayes J. Some clinical considerations in the prevention of suicide based on a study of 134 successful suicides. Am J Public Health. 1959; 49:888–899.

Wang S, Li Y, Chi G, Xiao S, Ozanne-Smith J, Stevenson M, Phillips M. Injury-related fatalities in China: An under-recognised public-health problem. Lancet. 2008; 372:1765–1773. [PubMed: 18930527]

Xiao SY, Wang XP, Xu HL. Current issues in China's suicide research and prevention [in Chinese]. Chin J Psychiatry. 2003; 36:129–131.

Yang GH, Zhou LN, Huang ZJ, Chen AP. The trend and geographic distribution of suicide in Chinese population. Chin J Epidemiol. 2004; 25:280–284.

Yip PS, Liu KY, Hu J, Song XM. Suicide rates in China during a decade of rapid social changes. Soc Psychiatry Psychiatr Epidemiol. 2005; 40:792–798. [PubMed: 16205852]

Zhang J. Marriage and suicide among Chinese rural young women. Soc Forces. 2010; 89:311–326.

Zhang J, Conwell Y, Wieczorek WF, Jiang C, Jia S, Zhou L. Studying Chinese suicide with proxy-based data: Reliability and validity of the methodology and instruments in China. J Nerv Ment Dis. 2003; 191:450–457. [PubMed: 12891092]

Zhang J, Conwell Y, Zhou L, Jiang C. Culture, risk factors and suicide in rural China: A psychological autopsy case control study. Acta Psychiatr Scand. 2004; 110:430–437. [PubMed: 15521827]

Zhang J, Norvilitis JM. Measuring Chinese psychological well-being with Western developed instruments. J Pers Assess. 2002; 79:492–511. [PubMed: 12511017]

Zhang J, Wieczorek W, Conwell Y, Tu XM, Wu BY, Xiao S, Jia C. Characteristics of young rural Chinese suicides: A psychological autopsy study. Psychol Med. 2009; 40:581–589. [PubMed: 19656428]

Zhang J, Xu H. Degree of suicide intent and the lethality of means employed: A study of Chinese attempters. Arch Suicide Res. 2007; 11:343–350. [PubMed: 17882622]

Zhang J, Zhou L. A case control study of suicides in China with and without mental disorder. Crisis. 2009; 30:68–72. [PubMed: 19525164]

Zhou L, Jiang C, Zhang J. The applicability of psychological autopsy for suicide research in China. Chin Ment Health J. 2006; 20:19–22.

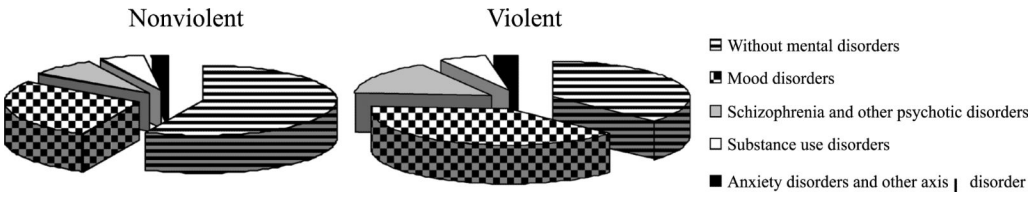

FIGURE 1.
Prevalence of mental illness in different suicide means.

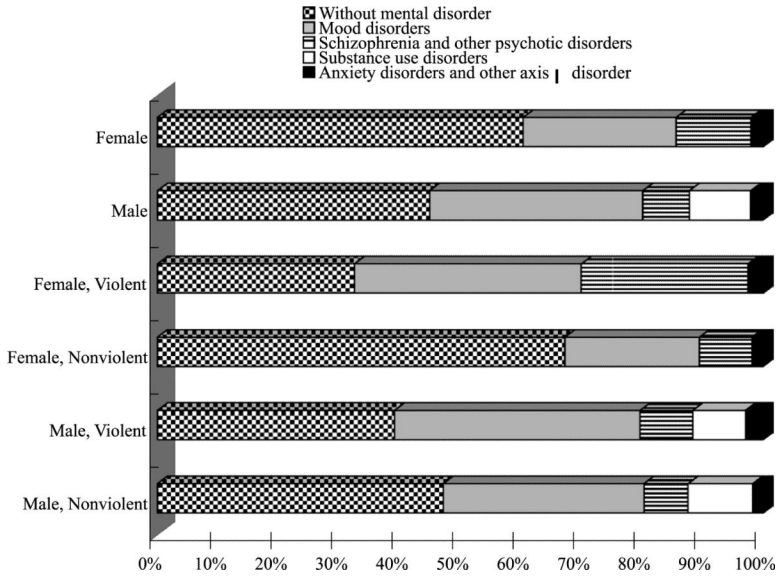

FIGURE 2.
Prevalence of mental illness in sex and suicide means.

J Nerv Ment Dis. Author manuscript; available in PMC 2011 November 1.

TABLE 1

Mental Disorder Diagnoses by Sex

	Men (*n* = 214)		Women (*n* = 178)			
Diagnosis[a]	***n***	**%**	***n***	**%**	χ^2	***p***
Any axis I disorder at time of interview	118	55.1	70	39.3	9.737	0.002
Mood disorders	87	40.6	51	28.6	6.137	0.013
Major depressive disorder	61	28.5	33	18.5	5.294	0.021
Bipolar disorder	6	2.8	6	3.4	0.105	0.746
Dysthymia	9	4.2	1	0.6	-	0.025
Mood disorder caused by a general medical condition	1	0.5	0	0	-	1.000
Mood disorder not otherwise specified	10	4.7	11	6.2	0.435	0.509
Schizophrenia and other psychotic disorders	18	8.4	25	14.0	3.158	0.076
Schizophrenia	17	7.9	23	12.9	2.627	0.105
Schizoaffective disorder	0	0	1	0.6	-	0.454
Psychotic disorder caused by a general medical condition	1	0.5	1	0.6	-	1.000
Psychotic disorder not otherwise specified	0	0	0	0	-	-
Substance use disorders	25	11.7	0	0	-	0
Alcohol use disorder	23	10.7	0	0	-	0
Substance use disorder other than alcohol	2	0.9	0	0	-	0.503
Anxiety disorders and other axis I disorders	6	2.8	4	2.2	-	1.000
Generalized anxiety disorder	1	0.5	2	1.1	-	0.593
Phobic disorder	3	1.4	0	0	-	0.254
Posttraumatic stress disorder	1	0.5	0	0	-	1.000
Anxiety disorder not otherwise specified	0	0	1	0.6	-	0.454
Acute stress disorders	0	0	1	0.6	-	0.454
Pathological gambling	1	0.5	0	0	-	1.000
Any secondary diagnosis	19	10.3	10	5.1	1.508	0.219

[a]The sum of all diagnoses exceeds the number of study subjects with and diagnosis because of multiple diagnoses.

TABLE 2

Comparison of Sociodemographic Characteristics of Victims With and Without Mental Disorders

Predictor	Mental Disorders		$\chi^2/t/z$	*p*
	With (*n* = 188)	Without (*n* = 204)		
Men, *n* (%)	118 (63.8)	96 (47.1)	9.737	0.002
Age, mean (SD), yrs	28.63 (5.87)	25.18 (6.36)	–5.564	0
15 to 24 yrs, *n* (%)	46 (32.6)	95 (67.4)	9.121	0.003
25 to 34 yrs, *n* (%)	142 (56.6)	109 (43.4)		
Annual family income, median (Q_L,Q_U), yuan	10000 (5000,15000)	10000 (6000,20000)	–2.061	0.039
Personal annual income, median (Q_L,Q_U), yuan	3000 (0,6000)	3000 (0,7200)	–1.296	0.195
Education, mean (SD), yrs	7.8 (7.3)	8.4 (9.3)	0.670	0.503
Marital status			1.324	0.250
Currently married	104	101		
Not currently married	84	103		
Pesticides stored at home, *n* (%)	145 (77.1)	150 (73.5)	0.435	0.509
Health condition, *n* (%)			32.443	0
Poor	60 (31.9)	28 (13.7)		
Average	47 (25.0)	31 (15.2)		
Good	81 (43.1)	145 (71.1)		

Differences are tested using a two-tailed *t*-test.

Q_L indicates 25th percent; Q_U, 75th percent.

TABLE 3

Comparing Suicide Means Between the Victims With and Without Mental Disorders

	Total		With Mental Disorders		Without Mental Disorders	
Suicide Method	***n***	**%**	***n***	**%**	***n***	**%**
Nonviolent*	300	76.5	129	68.6	171	83.8
Pesticides**	260	66.3	112	59.6	148	72.5
Other poison	27	6.89	10	5.3	17	8.3
Overdose	12	3.06	7	3.7	5	2.5
Gas	1	0.26	0	0	1	0.5
Violent	92	23.5	59	31.4	33	16.2
Hanging	41	10.5	25	13.3	16	7.8
Drowning	20	5.1	11	5.9	9	4.4
Jumping	7	1.79	5	2.7	2	1.0
Electronic	1	0.26	0	0	1	0.5
Wrist-cutting	1	0.26	1	0.5	0	0
Sophistication	2	0.51	2	1.1	0	0
Railway	1	0.26	1	0.5	0	0
Other	19	4.85	14	7.4	5	2.4

*Denotes significant difference between those with and without mental disorder, $p < 0.05$.

**$p < 0.01$.

TABLE 4

Comparing Suicide Means, Impulsivity, and Suicide Intent Between the Suicides of Those With and Without Mental Disorders

	Mental Disorders			
Predictor	**With (*n* = 188)**	**Without (*n* = 204)**	**χ^2/t**	***p***
Suicide by nonviolent, *n* (%)	129 (43.0)	171 (57.0)	12.596	0.000
Suicide by violent, *n* (%)	59 (64.1)	33 (35.9)		
Impulsivity, mean (SD)	12.4 (4.9)	14.2 (4.6)	3.905	0.000
Functional	5.7 (2.4)	6.8 (2.1)	4.668	0.000
Dysfunctional	6.6 (3.5)	7.4 (3.5)	2.302	0.022
SIS total score, mean (SD)	8.9 (0.2)	7.7 (0.2)	–3.396	0.001

The differences were tested using a two-tailed *t*-test.

SIS indicates Suicide Intent Scale.

TABLE 5

Results of Logistic Regression Analysis Predicting Violent Method Choice (=1) *vs.* Nonviolent Method Choice (=0)

	Men			Women		
Independent Variable	***p***	**Exp(B)**	**95%CI**	***p***	**Exp(B)**	**95%CI**
Mental disorders	0.020	2.434	1.153 to 5.141	0.000	6.853	2.584 to 18.174
Marital status	0.029	2.441	1.093 to 5.452	0.012	0.225	0.070 to 0.725
Age	0.004	0.281	0.119 to 0.663	0.027	4.034	1.175 to 13.846
Pesticide stored at home	0.000	0.242	0.114 to 0.515	0.023	0.334	0.130 to 0.859
Personal annual income	0.018	1.795	1.104 to 2.916	—	—	—
Constant	0.068	0.381	—	0.001	0.163	—