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Degree of Suicide Intent and the Lethality of Means Employed: A Study of Chinese Attempters

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Abstract

This study was designed to determine if there is a relationship between the degree of suicide intent and the lethality of means employed by those who try to kill themselves. The study sample consists of 74 suicide attempters admitted to emergency rooms in a northeastern area of China. Structured interviews were performed with the patients and their companions to the hospital if necessary. It was found that the reason for the suicide attempt claimed by the highest percentage of attempters (35 of 74) was love/marriage issues, and there were significant gender differences in suicide reasons. It also was found that the choice of suicide means is generally independent of gender, and the lethality of means is positively correlated with the degree of suicide intent. One of the implications of the findings is a better understanding of the higher suicide rates for Chinese women than Chinese men. A hypothesis for future study on Chinese suicide may be that the high fatality rate of Chinese women who have swallowed poisonous pesticide is a function of the strong intent of death of the victim coupled with the well-known lethality of the pesticides.

Keywords

China; degree of suicide intent; lethality; suicide; suicide means

To account for the uniqueness in Chinese suicide gender ratio where females are at higher risk of suicide than males (Phillips, Li, & Zhang, 2002; Zhang, 2000) while the reverse is found elsewhere in the world (Brockington, 2001; Pritchard, 1996), some researchers speculated that it is a function of the availability of pesticides in rural China (Phillips, Li, & Zhang, 2002). They argue that farming pesticides are readily assessable by most people in rural areas regardless of his or her degree of suicide intent and the lethality of the pesticides coupled with poor medical facilities for rescue kills most of those who have swallowed them. Previous researchers further argued that given the fact that females are more likely than males to attempt suicide (Maris, Berman, & Silverman, 2000; p. 286), females will logically surpass males in the number of completed suicides if they use means of the same lethality. However, in rural China, not all suicides and attempters used the lethal pesticides even though pesticides are available to them all (Zhang, Yates, Li et al., 2004), and the choice of suicide means could be determined by the individual's level of suicide intent. It is imperative to find the relationship between suicide intent and selection of suicide means. If a positive association is established between the intensity of suicide desire and lethality of the

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means selected by the attempter, the higher suicide rates for Chinese females than their male counterparts may have to be understood with something rather than the availability and lethality of farming pesticides.

We test our hypotheses by studying people who have seriously attempted suicide, based on the evidence that suicides and attempters are from two different but overlapping populations (Beautrais, 2001) and it is greatly possible to assess the characteristics of suicides by studying attempters from the same general population. Maris, Berman, and Silverman (2000) proposed a 10-level continuum of suicidality from the lowest to the highest suicidality. They are (1) totally non-suicidal, (2) suicide ideation [fleeting], (3) suicide ideation [chronic], (4) suicide-like gesture, (5) diffuse risky lifestyle, (6) suicide plan [vague, non-lethal], (7) suicide plan [specific, lethal], (8) non-serious [low-lethality] suicide attempt, (9) serious [high-lethality] suicide attempt, and (10) completed suicide (Maris, Berman, & Silverman, 2000, p. 31). A serious suicide attempt that requires emergency room treatment is just one step before completed suicide. However, the degree of suicide intent of all those admitted to emergency rooms may vary.

Among people with the same level of suicide intent, lethality of the means available to and employed by each attempter should make a difference, if rescue efforts are not considered. In the United States, firearms account for 63.5% of male suicides and 38.5% of female suicides and rank as number one on the list of lethal means of suicide (NCHS, 1998). The top means from the most lethal to the least lethal are: guns, hanging, carbon monoxide, jumping, drowning, suffocation by plastic bag, cutting, and poisoning. In China, where firearms are not assessable for non-military individuals, swallowing poisons (pesticides in rural China) is the most lethal means for suicide in rural areas. The lethality of a means is usually tested and verified by the number of deaths in comparison with other means, over a period of time and with a number of subgroups in a population. Various studies on rural Chinese suicides have concluded that farming pesticides have killed more women and men who attempted suicide (Phillips, Li, & Zhang, 2002; Zhang, Conwell, Zhou et al., 2004) and should be the most lethal means of suicide in rural China. However, in urban China, the lethality of suicide means with the absence of firearms, ranging from highest to the lowest are (1) hanging, (2) jumping, (3) gas, (4) pills (5) pesticides, and (6) cutting (Xu, Xiao, & Chen, 1999; Zhao, Ying, & Shi, 2001).

Suicide is a rational choice of the victim. As defined by Durkheim (1951 [1897]), “Suicide is applied to all cases of death resulting directly or indirectly from a positive or negative act of the victim himself, which he knows will produce this result” (p. 44). Suicide is not unintentional, and it is usually not sub-intentional, either (Maris, Berman, & Silverman, 2000, p. 31). Accidental deaths generally are not seen as suicides. Therefore, selection of the suicide means in terms of its lethality is usually a rational choice by the suicidal person depending on the person’s degree of suicide intent. It is hypothesized for the study that the stronger the suicide intent of an individual, the more lethal the means the individual chooses in the act.

METHOD

Subjects

The subjects for study were consecutively sampled attempters of suicide (n = 74) admitted to emergency rooms immediately after the suicidal act in Dalian areas of China. Dalian, with a population of over five million, is the second largest city in the Liaoning province of China. Six hospitals were randomly selected from about 20 in the Dalian area. Researchers contracted hospital administrators and the emergency room directors of each of the six

hospitals, and they agreed to data collection. Table 1 illustrates the characteristics of the subjects in the sample.

Instruments

We developed a four-page questionnaire for the semi-structured interview. The instrument consists of 58 questions in total covering Beck's Suicidal Intent Scale (SIS, Beck, Schuyler, & Herman, 1974) and an open question soliciting the means the subject used in the suicidal act. Of the 20 SIS items. For brevity, we used the first eight that assess the circumstances related to suicide attempt. Each of the eight questions has a response range from 0 to 2, and the total score of the SIS could be from 0 to 16. The Chinese version of the SIS has been validated in an earlier study with good reliability and validity scores for Chinese populations (Zhang, Conwell, Wieczorek et al., 2003).

Other questions address social correlates of suicidal behavior such as marital status, religiosity, gender values, and religious superstition hypothesized in the Chinese culture, as well as the demographic information.

Procedure

The research protocol was approved by the IRB at both the collaborating university in China and the first author's university in the United States. The medical staff in the emergency rooms received training on how to administer the interview questionnaire as well as on the human subject protection issues. From July to November, 2003, the trained medical staff in each of the six hospitals consecutively interviewed patients hospitalized after a suicide attempt with the four-page questionnaire. Each interview was preceded by a signature on the consent form by the interviewee. The interview was accomplished with information from the patient as well as his/her companion (usually a family member or friend) who came to the emergency room with the patient. Every patient in the sample had a companion to the hospital and both the patient and companion were required to give informed consent for the study. If the patient was too weak to answer questions, the companion helped complete the interview. Each interview lasted about 10 to 30 minutes, depending on the cooperation level of the patient and his/her companion. All cases sampled participated in the study.

RESULTS

Data analyses were performed with the SPSS 12.0 for Windows. The good internal consistency of the Chinese version of the SIS is once again confirmed with the current study sample (Cronbach's alpha = .75).

The open question on the suicidal means by the subjects in the study sample yields eight items from the most frequent to the least frequent means: (1) pills [48 cases], (2) cutting wrist [8 cases], (3) pesticide [7 cases], (4) gas [5 cases], (5) jumping [2 cases], (6) pills plus cutting wrist [2 cases], (7) cutting belly [1 case], and (8) cutting ear and penis [1 case]. To further conceptualize the categories, we put together all the means related to cutting, and the Chinese urban data offers a list of five means of suicide. Table 2 illustrates the means of suicide from high to low on their lethality rank as defined in previous studies on Chinese suicide (Xiao, Li, & Zhang, 2002; Xu, Xiao, & Chen, 1999; Zhao, Yang, & Shi, 2001). The table also presents the frequency of each means as well as the averaged SIS score associated with each means, for men and women respectively.

We recoded the suicide means based on the ranking order of lethality (Xu, Xiao, & Chen, 1999; Zhao, Yang, & Shi, 2001), and the new variable of suicide methods has the following numerical values: 1 = cutting, 2 = pills 3 = pesticides, 4 = gas, 5 = jump-jumping, 6 = hanging. The value of hanging is treated as system missing since nobody in the sample falls

in that category. The SIS scores are significantly correlated with the lethality of suicide means ($r = .315$, $p = .008$). The stronger an attempter's desire to kill him/herself, the more lethal the means the victim will choose. It is true for both men ($r = .30$, $p = .004$) and women ($r = .36$, $p = .01$) in the sample.

The suicide intent degree varies among those attempters who have claimed different reasons for the behavior. As Table 3 shows, the highest SIS score (7.67) is found for those who said poverty as the reason for the suicidal behavior, although the reason claimed by the highest percent of attempters (35 of 74) is love and marriage issues.

Additionally, the data allowed us to investigate certain correlates of suicide intent on top of the lethality of suicide means. We included age, marital status and mental disorder, as well as the suicide methods in a multiple linear regression model and found that approximately 61% of the variance in the sample's suicide intent is explained by the selected variables (Table 3). For the analysis, marital status is recoded into 0 = currently unmarried and 1 = currently married. Marital status seems not related to the degree of suicide intent.

DISCUSSION AND CONCLUSION

This study has investigated the relationship between the degree of suicide intent and the lethality of the means employed with 74 attempters of suicide admitted to emergency rooms immediately after the suicidal act. We found that approximately 65% (48 of 74) of the attempters had ingested medications (usually sleeping pills or anxiety reduction pills), 11% (8 of 74) cut wrists, 9% (7 of 74) swallowed pesticides, and 7%(5 of 74) inhaled carbon monoxide (see Table 4). This pattern of methods used for suicide coincides pretty much with what has been found by Xue and her colleagues (2004) with their 7-year study in a general hospital in China. They found in the prevalence of suicidal behaviors in Beijing that the predominant methods of attempt were ingested medications (58.2%), wrist-cutting (10.0%), ingested pesticide (8.4%), and carbon monoxide (7.34%).

In China, especially in rural areas, a high proportion of suicide attempters ingest highly lethal pesticides to kill themselves (Pearson, Phillips, & He, 2002). Phillips, Li, and Zhang (2004) concluded ingestion of pesticides was four times more common among persons treated in rural hospitals in China (43%; 2,533 of 5,954) than among those treated in urban hospitals (10%; 457 of 4,627) and that was determined by the availability of suicide means. Some researchers argued that, in the case of self-poisoning, suicidal intent did not influence the choice of toxic agent, nor the choice of method (Nielsen, Stenager, & Brahe, 1993). However, our results provided evidence for a positive association between degree of suicide intent and the lethality of means employed by the attempters in the study sample in Table 2 ($r = 0.315$, $p = 0.008$). The finding has been supported by many other previous studies, such as Hamdi, Amin, and Mattar (1991), Haw, Hawton, Houston et al. (2003), and Kumar, Mohan, Ranjith et al. (2006).

In the West, men tend to choose violent and lethal methods such as shooting or jumping from a high place, while women usually prefer less violent or lethal means such as poisoning, with the assumption that the less lethal method leaves a chance for intervention and rescue (Bille-Brahe & Jessen, 1994). In our sample, however, there was no significant gender difference in the choice of suicide means. This finding is supported by Li, Phillips, Ji et al. (2004) who also reported that the suicide means used in attempt were similar in male and female attempters treated in general hospitals in China. Therefore, the choice of suicide means is not a function of gender but that of something else, such as suicide intent.

In this study, we found that the suicide reason claimed by the highest percentage of attempters (35 of 74) was love/marriage issues, and there were significant gender differences

in suicide reasons. In a similar study of Chinese suicide, Li, Phillips, Ji et al. (2004) reported that the most frequent life events for suicide attempters were love and marital conflict. Lester, Wood, Williams et al. (2004) studied a large sample of suicide notes from Australia and found that suicides less often had escape from pain as a motive for their suicides and more often had love/romantic problems. It is possible that motivation in female attempters may be lower than in male ones and females had more love/marriage issues than males. The choice of method is probably also related to the motive for suicide (Bille-Brahe & Jessen, 1994). In our study, we found that the degree of suicide intent did not vary with the suicide reasons attempters claimed ($F = 1.56$, $P = 0.18$). From our findings, the highest SIS score (7.67) was found for those who said poverty was the reason for the suicide behavior. Reviere, Battle, Farber et al. (2003) indicated that the SIS score was 10.48 among low-income population who had presented for emergency treatment after a suicide attempt. Moreover, we conducted multiple comparisons of average SIS sore for different reasons for suicide attempters and found there was a difference between poverty and love/marriage issues and family/friend relationships (mean difference = 2.40, $p = 0.025$; mean difference = 3.07, $p = 0.007$, respectively).

The relationship between the degree of suicide intent and the lethality of suicide means chosen holds strong even in the multiple linear regression analysis, with age, marital status, and mental disorder controlled for. All those independent variables were significantly related to suicide intent in univariate analyses. Once again, the stronger the suicide intent of an attempter, the more lethal the means the attempter will choose.

This study shared the well-known methodological problems related to collection of consecutively sampled cases. The limitations of this study include relatively small sample, lack of diagnostic data which identified psychosis as a key variable, and use of retrospective self-reported data, which opened the possibility of response bias. Our future research should address these limitations, use prospective designs, and examine more fully the complex relationships among these variables and other key variables. Nonetheless, this study contributes to a growing body of literature addressing the links between degree of suicide intent and the lethality of means employed. Despite these limitations, we believe the findings merit further study in a larger population.

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TABLE 1

Characteristics of the 74 Attempters under Study

	Male (n = 25)	Female (n = 49)	Total (n = 74)	Statistic	P
Age (M ± SD)	33.44 ± 17.51	29.49 ± 15.34	30.82 ± 16.22	t = 0.99	0.33
Education				χ^2 = 0.52	0.53
Elementary	5 (20.0%)	9 (18.3%)	14 (18.9%)		
Junior High	13 (52.0%)	18 (36.7)	21 (28.4)		
Senior High	4 (16.0%)	14 (28.6%)	18 (24.3%)		
College	3 (12.0%)	8 (16.3%)	11 (14.9%)		
Family size (M ± SD)	3.24 ± 1.00	3.10 ± 0.89	3.15 ± 0.92	t = 0.56	0.57
SES				χ^2 = 6.25	0.04
Poor	12 (48.0%)	10 (20.4%)	21 (29.8%)		
Average	10 (40.0%)	33 (68.8%)	43 (58.1%)		
Wealthy	2 (8.0%)	5 (10.2%)	7 (9.5%)		
Marital status				χ^2 = 6.78	0.07
Single	12 (48.0%)	24 (49.0%)	36 (48.6%)		
Married	8 (32.0%)	14 (28.6%)	22 (29.7%)		
Divorced	4 (16.0%)	1 (2.0%)	5 (6.8%)		
Cohabitation	1 (4.0%)	9 (18.4%)	10 (13.7%)		
Employment				χ^2 = 0.23	0.79
Employed	7 (68.0%)	16 (32.6%)	23 (31.1%)		
Unemployed	17 (31.1%)	30 (61.2%)	47 (63.5%)		
Physical illness				χ^2 = 0.82	0.39
Yes	7 (28.0%)	9 (18.4%)	16 (21.6%)		
No	18 (72.0%)	39 (79.6%)	57 (77.0%)		
Mental disorder				χ^2 = 0.09	1.00
Yes	3 (12.0%)	7 (14.3%)	10 (13.5%)		
No	22 (88.0%)	41 (83.7%)	63 (85.1%)		
SIS score (M ± SD)	6.30 ± 2.38	5.30 ± 2.35	5.63 ± 2.40	t = 1.28	0.20
Suicide means				χ^2 = 6.97	0.16
Pills	14 (56.0%)	34 (69.4%)	48 (64.9%)		

	Male (n = 25)	Female (n = 49)	Total (n = 74)	Statistic	P
Pesticide	4 (10.0%)	3 (6.1%)	7 (9.5%)		
Gas	2 (8.0%)	3 (6.1%)	5 (6.8%)		
Jumping	1 (4.0%)	1 (2.0%)	2 (2.7%)		
Cutting	4 (10.0%)	8 (16.3%)	12 (16.2%)		
Suicide reasons				$\chi^2 = 12.79$	0.01
Love/marriage	8 (32.0%)	27 (55.1%)	35 (47.3%)		
Family/friend rel.	2 (8.0%)	3 (6.1%)	5 (10.6%)		
Feeling bad	2 (8.0%)	4 (8.2%)	6 (8.1%)		
Work/study stress	4 (16.0%)	11 (22.4%)	15 (20.3%)		
Physical illness	3 (12.0%)	1 (2.0%)	4 (5.4%)		
Poverty	6 (24.0%)	1 (2.0%)	7 (9.5%)		

TABLE 2

SIS Degrees and Attempting Methods for Males and Females

		Male		Female		Total	
Suicide means	**Rank for lethality of suicide means**	**n**	**SIS score**	**n**	**SIS score**	**n**	**SIS score**
Jumping	1	1	3.58	1	13.00	2	8.00
Gas	2	2	10.00	3	7.00	5	8.20
Pesticide	3	4	4.67	3	4.00	7	4.33
Pills	4	14	6.54	34	5.09	48	5.50
Cutting	5	4	5.75	8	5.00	12	5.21
Total		25	6.30	49	5.30	74	5.63

F = 2.46, P = 0.04.

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TABLE 3

Average SIS Degrees for Different Reasons of Suicide Attempt

	Male		Female		Total			
Reasons	**n**	**SIS score**	**n**	**SIS score**	**n**	**SIS score**	**F value**	**P**
Love/marriage	8	6.88	27	4.77	35	5.26		
Family/friend relationship	2	3.00	3	5.67	5	4.60		
Feeling bad	2	6.50	4	4.50	6	5.17		
Work/study stress	4	4.67	11	6.00	15	5.69		
Physical illness	3	8.00	1	4.00	4	7.00		
Poverty	6	6.60	1	14.09	7	7.67		
Other	0		2	6.50	2	6.50		
Total	25	6.30	49	5.30	74	5.63	1.56	0.18

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TABLE 4

Major Factors Related to Degree of Suicide Intent: A Multiple Linear Regression Analysis

Study variable	B	Std. error	Beta	t	P
Constant	6.733	1.688		3.989	.000
Age	.0037	.019	.255	1.952	.056
Having mental disorder	1.903	.705	.285	2.698	.009
Marital status	.303	.647	.061	.468	.641
Drastic suicide means	1.793	.755	.257	2.375	.021

Dependent Variable: SIS score; F = 6.91, P = .000.

R^2 = 0.61.

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