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Matched case-control study of medically serious attempted suicides in rural China

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Background: Suicide rates in rural China are two-fold to three-fold those in urban China but the reasons for this large difference remain unclear.

Aim: Assess the characteristics and risk factors of medically serious suicide attempts in rural China.

Methods: A comprehensive 2 to 3 hour structured interview was administered by psychiatrists to 297 medically serious suicide attempters (defined as those who remained in hospital for 6 hours or longer) treated in the emergency room of the People’s Hospital of Yuncheng County in Shandong Province and, separately, to their accompanying co-resident family members. A parallel interview was administered to control subjects matched for age and gender from the same village who had never made a suicide attempt and to their co-resident family members. Risk factors for attempted suicide were identified using Cox regression models.

Results: Among the 297 suicide attempters, 74% were female, 78% were farmers, their mean (sd) age was 33.2 (14.6) years, their mean length of formal schooling was 4.8 (3.1) years, 80% had attempted suicide by ingesting pesticides, 57% reported considering suicide for five minutes or less before acting, 76% had a score of less than 50 (range, 0 to 100) on the planning subscale of the Suicide Intent Scale, 11% had made prior attempts, and only 38% met DSM-IV criteria for a current mental disorder. After controlling for gender, age, location of residence and prior suicide attempt (in the matched analysis), risk factors identified in the multivariate analysis included a low level of education, having relatives or associates with prior suicidal behavior, experiencing four or more negative life events in the prior year, a low quality of life and low family cohesion over the prior month, high depressive symptom scores over the prior two weeks, and (only assessed in a subsample) high impulsivity and aggression.

Conclusion: Many of the medically treated suicide attempts in rural China are low-intent attempts by the ingestion of pesticides in persons who do not meet criteria of a mental disorder but have high levels of impulsiveness and aggression. This profile is different from that seen in high-income countries so it will require a different approach to the prevention of suicidal behavior, an approach that is less focused on the identification and treatment of mental disorders and more focused on limiting access to agricultural poisons and training impulsive individuals about self-regulation of their emotions and behaviors.

1. Introduction

Suicide is the fourth most important public health problem in China based on the disability-adjusted life year (DALY)[1] measure. Mortality data from the Ministry of Health indicates that about 195 000 people in China died by suicide annually from 2002 to 2006.[2] Unlike other countries, suicide rates in rural China are two-fold to three-fold higher than those in urban China[2,3] but the reasons for this difference remain unclear. Possible explanations for the higher suicide rates in rural regions include greater poverty and social deprivation, higher rates of mental illness, lower access to mental health services, higher levels of impulsive behavior, and ready access to highly toxic pesticides (resulting in higher case-fatality for suicidal behavior).

In China, like elsewhere, prior suicide attempt is the most important risk factor for suicide.[4,5] So identification of the risk factors for suicide attempt is an essential component of suicide prevention efforts. Prior studies in China have shown that gender, age, location...
of residence (rural vs. urban), and previous history of attempted suicide are important risk factors for suicide attempt. The present study aims to clarify the role of other potential risk factors for suicide attempt in rural China after controlling for these previously identified factors using a matched case-control design.

2. Subjects and methods

2.1 Recruitment of cases and matched controls

The enrolment of subjects is shown in Figure 1. All subjects were identified in the emergency room of the People’s Hospital of Yuncheng County in Shandong Province from August 1998 to August 2000. This is a 500-bed county-level hospital that serves a rural population of 1.2 million individuals. Over this period 345 different individuals were treated for suicide attempts. Among them, 297 met our definition of ‘medically serious suicide attempt’ — they remained in hospital for treatment of non-fatal deliberate self-harm for six hours or longer— and provided written informed consent to participate in the study. All of these individuals either expressed some level of suicidal intent or the circumstances of the self-harm indicated that there was some level of suicidal intent. For each case a co-resident family member who accompanied the patient to the emergency room was selected as a secondary informant; this individual also completed a written informed consent form. The study was approved by the Ethics Committee of Beijing Huilongguan Hospital.

Matched controls (1:1 matching) were identified from the same village as the cases. For each case persons of the same gender and age (within three years) in the village were numerated and one of these was randomly selected. For each control the co-resident family member who was most familiar with the subject was selected as a secondary informant. Both the control subject and the participating family member provided written informed consent to participate in the study.

2.2 Assessment of study subjects and their family informants

Trained attending-level psychiatrists conducted extensive 2 to 3 hour surveys with each identified individual (cases and controls) and with the family informant for each identified individual (that is, four separate interviews for each case-control pair). For the cases and family members of cases, after introduction of the purpose and content of the survey and obtaining written informed consent, the survey starts with an open-ended audio-taped interview of about 20 minutes that discusses respondents’ understanding of the factors that lead to the self-harm behavior. This is followed by a detailed structured questionnaire about the circumstances of the attempt, suicidal intent, life events, quality of life, physical health and family functioning. During the course of the study we decided to add two measures that assess impulsiveness and aggressiveness so these were administered in a subset of subjects. The survey concludes with administration of an adapted Chinese version of the Structured Clinical Interview for DSM-IV (SCID-P). When conducting the survey with family informants the questions and probes are altered to refer to the identified patient. With a very few exceptions these interviews were conducted in the hospital at the time of the admission for the suicide attempt after the patient had become medically stable.

A parallel survey is conducted with controls and family informants for controls in their homes; in these interviews the focus of the open-ended part of the

Figure 1. Enrollment of subjects
interview is changed to discuss respondents’ beliefs, attitudes and experience of suicidal behavior, and the sections of the structured questionnaire specifically about the current suicide attempt are deleted but all the other content is the same as that in the interviews with patients and their family members.

This comprehensive survey instrument was developed from the instrument used in the national psychological autopsy study of suicide deaths[4] and underwent three revisions over a period of two years prior to use in this study. Several items are added to make the questionnaire valid with both urban and rural respondents: economic status is measured both in terms of cash income (which is less relevant in rural areas) and in terms of the number of conveniences in the household (fridge, television, telephone, air conditioner, etc); work status is assessed both in terms of having wage-earning employment (most farmers do not) and in terms of functioning in a productive social role (worker, farmer, homemaker, student, etc.). The instrument has now been used in a number of studies of attempted suicide in China.[6,8] Extensive description of the instrument is provided (in Chinese) in Li & Phillips 2007.[11]

All survey instruments were checked for completeness and internal coherence by research managers who would re-interview informants if needed to complete or clarify information. One-twentieth of cases were randomly selected for re-interview by a second investigator to confirm the diagnosis and other information obtained in the original interview.

2.3 Measures

The level of suicide intent in cases was assessed using the planning subscale score of the Chinese version of the Beck Suicide Intent Scale (SIS),[12] which includes 8 items scored 0, 1, or 2. The total score (range 0 to 16) was converted to a 0–100 point scale with higher scores representing greater intent to die. Widely used in China, this subscale score has good internal consistency in China (alpha=0.81).[13]

The life event scale[14] has been specifically developed for use in suicide research in China; it assesses the occurrence of 60 negative life events and, for those that have occurred, asks respondents to estimate the time over the last year that the life event had a negative psychological effect and the severity of the effect (scored 0 to 4, from no effect to very severe effect). This scale is used to generate an overall chronic stress score due to negative life events (the product of the severity and the number of months the psychological effect was present over the prior year summed for all negative life events) and an acute stress score (the product of the reported severity and the inverse of the time interval between the event and the attempt [or the time of interview in controls] summed for all negative life events). Prior research has found that these two measures have good inter-rater consistency (for the chronic stress score ICC=0.75, for the acute stress score ICC=0.68).[14]

A quality of life scale developed for use in China asks respondents to rate their functioning over the prior month in six areas (physical health, psychological health, economic circumstances, work, family relationships, and relationships with non-family) on a scale of 1 (very poor) to 5 (excellent). The total score (range 6 to 30) is then converted to a 0–100 scale, with higher values representing better reported quality of life. This measure has been used in a number of studies in China and has high inter-rater reliability (ICC=0.83).[45]

The adapted Chinese versions of the 2nd version of the Family Adaptability and Cohesion Scales (FACES-II-CV),[15,16] the Buss & Perry Aggression Questionnaire[17] and the Barratt Impulsiveness Scale[18] are 30-item self-report measures that have been shown to have good reliability and validity in China.[15,19] Responses for the items on the questionnaires use 5-point Likert scales; the four summary measures from the three questionnaires are normally distributed continuous measures that assess family adaptability, family cohesion, aggression (of the target subject), and impulsiveness (of the target subject).

Psychiatric diagnoses were made based on administration of an adapted Chinese version of the Structured Clinical Interview for DSM-IV diagnoses (SCID).[6,19] by an attending-level psychiatrist. For the purposes of this study the depression section of the SCID was modified as follows: a) for each symptom that was definitely present or considered ‘subthreshold’, the number of days the symptom was continuously present prior to the attempt (or, in controls, the interview) was recorded; and b) all nine symptoms of depression were assessed even if depressive affect or loss of interest were absent (i.e., no skip-outs). Based on responses to the questions about depression we computed a score that represented the severity of depressive symptoms in the two weeks prior to the attempt (or, in controls, prior to the interview) as follows: the product of the symptom severity (0, not present; 1, subthreshold; 2, definitely present) and the number of days the symptom was present in the prior 14 days (0 to 14), summed for all nine symptoms of depression. This generates a score with a range from 0 to 252 which is converted to a 0 to 100 point scale.[20] The advantage of this measure over the diagnosis of depression (a dichotomous measure) or the count of the number of symptoms that are present is that it quantifies subthreshold depressive symptoms and symptoms that had lasted for less than 14 days prior to the suicide attempt (or, in the case of controls, prior to the interview). The concordance of this measure between subjects and their family informants is excellent (ICC=0.80).[20]

With the exception of family functioning scale
(FACES-II-CV), for all other questionnaires, the version administered to the family members of the target subjects (i.e., cases and controls) was altered so the information obtained was about the target subjects, not about the respondents themselves. For most measures of interest there were two estimates, the estimate generated from the interview with the target subject and the estimate generated from the independent interview with the family informant. For continuous measures (including level of suicidal intent, family adaptability and cohesion, quality of life, impulsiveness, aggression, and severity of depressive symptoms) the mean value of the two estimates is used in the analysis. For dichotomous or categorical outcomes such as the presence of a prior suicide attempt or of a psychiatric diagnosis, a ‘code-up’ strategy was used; that is, if either interview identified the presence of a specific event (e.g., a prior suicide attempt) or a psychiatric diagnosis, this was coded as present even if the other interview did not concur. We use the ‘code-up’ strategy because of the tendency of Chinese respondents to deny psychological symptoms which makes the risk of false negatives much greater than the risk of false positives.

2.4 Statistical analysis

SPSS 15.0 software was used for the analysis. This is a 1:1 matched case-control study, so Cox regression models using case versus control as the ‘status’ variable and each case-control pair as the strata was used to generate univariate and multivariate matched odd ratios (OR) and the corresponding 95% confidence intervals for potential risk factors for attempted suicide.

The Cox regression analysis used both forward and backward entry (to ensure that the results were stable) of variables that proved statistically significant in the univariate analysis. There was considerable overlap between variables, so variables in each category of risk factor (demographic, psychological, and social) were initially tested to identify those that had the strongest independent relationship with suicide attempt. The remaining variables from each group were then combined in an overall analysis. However, the acute stress variable was excluded: none of the control subjects reported recent negative life events so the acute stress score was zero for all of the controls making it impossible to enter this variable in the multivariate analysis. Similarly, prior suicide attempt was an exclusion criterion for the control group, so it was not possible to include this variable in the multivariate analysis. And the impulsiveness and aggression scales were only assessed in a subgroup of subjects so these variables were not entered in the final models. To facilitate interpretation of OR values, with the exception of the years of schooling, the continuous variables were divided into dichotomous variables at the medians before conducting the regression analysis. A total of 276 pairs of cases remained in the multivariate analysis (there was no assessment of family functioning in 21 cases). There were not significant interaction effects between the six variables that remained in the final model. To assess risk factors for a first suicide attempt, a second regression analysis was conducted after removing case-control pairs in which the case had previously made a suicide attempt (leaving 246 case-control pairs in the analysis).

3. Results

Among the 297 pairs of participants, 74.4% (221 pairs) were female. The mean (sd) ages of the patients and controls were 33.2 (14.6) years and 33.3 (14.3) years.

| Table 1. Characteristics of the 297 medically serious suicide attempts treated in the emergency department of Yuncheng County People’s Hospital, Shandong, China |
|---------------------------------|-------------------|
| Female                         | 74%               |
| Mean (sd) age in years         | 33.2 (14.6)       |
| Mean (sd) years of formal schooling | 4.8 (3.1)       |
| Farmer (i.e., primary income from a family farm) | 77.8%          |
| **Marital status**             |                   |
| never married                  | 18.6%             |
| currently married              | 71.0%             |
| separated, divorced or widowed | 10.4%             |
| **Negative life events**       |                   |
| experienced 1 to 14 negative life events in prior year | 100.0%          |
| experienced 1+ chronic (persist>1 year) life events | 41.1%           |
| experienced 1 to 5 negative life events in prior month | 79.8%          |
| **Psychiatric diagnosis using SCID** |               |
| any diagnosis                  | 38.4%             |
| meet criteria for depression   | 27.3%             |
| meet criteria for alcohol use disorder | 0.0%          |
| **Communicated with others about intent** |               |
| did not indicate intention to others | 63.5%          |
| directly told others prior to the attempt | 31.6%           |
| indirectly suggested their intent to others | 5.1%           |
| **Stated goal of the suicide attempt** |             |
| to control behavior of others  | 41.4%             |
| to escape from distressing reality | 24.9%           |
| other goals                    | 33.7%             |
| **Method of attempt**          |                   |
| pesticide ingestion            | 80.5%             |
| ingestion of medication        | 18.2%             |
| other methods                  | 0.3%              |
| Pesticide or medication used in attempt was stored in home, not purchased for purpose of attempt | 79.1%           |
| Had made a prior suicide attempt | 10.4%           |
| Composed a will prior to the attempt | 2.4%           |
| Reported ambivalent feelings about wanting to die | 54.2%           |
| Had thought that death was an unlikely outcome | 37.4%           |
| Considered suicide <5 minutes before acting | 57.1%           |
| Planning subscale score on Suicide Intent Scale <50 (range 0-100) | 76%             |
respectively. The characteristics of the 297 subjects who had attempted suicide are shown in Table 1. The vast majority were married farmers with a low level of education. Pesticide ingestion, typically using pesticides stored in the home for other purposes, was the main method used to attempt suicide. Only 114 (38.4%) had a current mental illness as assessed using the SCID. The intent to die was not particularly strong in most of these individuals. Over half of the attempts appeared to be impulsive acts that typically occurred in the context of interpersonal conflicts. Among these individuals, 31 (10.4%) had previously made a suicide attempt.

Univariate analysis of potential risk factors for suicide attempt is shown in Table 2. After controlling for gender, age, and location of residence through matching, we identified several demographic, psychological and social factors that distinguished the cases and controls. Compared to control subjects, individuals who attempted suicide had less education, fewer household conveniences (a measure of economic status), were less likely to be functioning in a productive social role, and were more likely to be separated, divorced or widowed. With the exception of the rates of prior treatment for psychological problems, all the other psychological

| VARIABLE                                      | Number of pairs | case/control pairs | paired OR  | 95% CI     |
|-----------------------------------------------|-----------------|--------------------|-----------|------------|
| DEMOGRAPHIC VARIABLES                         |                 |                    |           |            |
| Little schooling (5 years or less)            | 297             | 104                | 79        | 36         | 78        | 2.19 | 1.48-3.26 |
| Lower (below median) per capita family income | 296             | 96                 | 101       | 64         | 58        | 73    | 1.13 | 0.77-1.57 |
| Fewer household conveniences                  | 297             | 94                 | 98        | 43         | 62        | 2.28 | 1.59-3.26 |
| Not currently married                         | 297             | 61                 | 36        | 28         | 172       | 1.29 | 0.79-2.11 |
| Separated, divorced or widowed                | 297             | 3                  | 28        | 14         | 252       | 2.00 | 1.03-3.80 |
| Does not have wage-earning employment         | 297             | 253                | 17        | 17         | 10        | 1.00 | 0.51-1.56 |
| Currently not functioning in a productive social role | 297            | 6                  | 28        | 12         | 251       | 2.33 | 1.19-4.59 |
| Physically disabled                           | 297             | 1                  | 6         | 2          | 288       | 3.00 | 0.61-14.86 |
| PSYCHOLOGICAL FACTORS                         |                 |                    |           |            |
| High chronic stress                           | 297             | 69                 | 110       | 46         | 72        | 2.39 | 1.70-3.37 |
| High acute stress                             | 297             | 16                 | 265       | 0          | 16        | 65.29 | 24.32-175.31 |
| High depression symptom score in prior 2 weeks | 297            | 4                  | 99        | 3          | 191       | 33.00 | 10.46-104.08 |
| Any psychiatric diagnosis                     | 297             | 11                 | 103       | 14         | 169       | 7.36 | 4.21-12.86 |
| Any prior psychological treatment             | 297             | 9                  | 41        | 28         | 219       | 1.46 | 0.91-2.37 |
| Used psychiatric medication in last month     | 297             | 2                  | 29        | 20         | 246       | 1.45 | 0.82-2.56 |
| High impulsiveness                            | 132             | 20                 | 86        | 0          | 26        | 65.29 | 11.53-369.70 |
| High aggression                               | 132             | 17                 | 93        | 3          | 19        | 31.00 | 9.82-97.87 |
| SOCIAL FACTORS                                |                 |                    |           |            |
| Blood relative with prior suicidal behavior    | 297             | 1                  | 14        | 6          | 276       | 2.33 | 0.90-6.07 |
| Associate with prior suicidal behavior         | 297             | 60                 | 95        | 57         | 85        | 1.67 | 1.20-2.32 |
| Low quality of life in last month             | 297             | 73                 | 141       | 23         | 60        | 6.13 | 3.95-9.53 |
| Saw medical doctor in last month              | 296             | 6                  | 47        | 42         | 201       | 1.12 | 0.74-1.70 |
| Four or more negative life events in last year | 297             | 74                 | 127       | 29         | 67        | 4.38 | 2.93-6.56 |
| Severe negative life event in last two days   | 297             | 0                  | 230       | 0          | 67        | 65.29 | 22.61-188.49 |
| Children under seven in the household         | 297             | 42                 | 40        | 41         | 174       | 0.98 | 0.63-1.51 |
| Lives alone                                    | 297             | 0                  | 14        | 3          | 280       | 4.67 | 1.34-16.24 |
| Low family cohesion                           | 276             | 68                 | 118       | 30         | 60        | 3.93 | 2.64-8.87  |
| Low family adaptability                       | 276             | 69                 | 112       | 30         | 65        | 3.73 | 2.50-5.59  |
| Decrease in social activity in last month     | 297             | 1                  | 57        | 4          | 235       | 14.25 | 5.17-39.27 |
behavior, multiple negative life events in the prior year, and low family cohesion and low overall quality of life in the prior month.

A second multivariate regression analysis conducted after removing case-control pairs in which the case had had a prior suicide attempt (leaving 246 cases-control pairs in the analysis) generated exactly the same set of predictor variables as shown in Table 3, though the family cohesion variable was no longer statistically significant (OR=1.70; 95%CI=0.99–2.90; p=0.054).

4. Discussion

4.1 Main findings

This study collected a relatively large sample of medically treated suicide attempts from rural Shandong. Almost all consecutively treated patients were included in the analysis so the sample is representative of all such suicide attempts treated at this location. Several characteristics of the sample highlight differences from suicide attempts reported from high-income countries[5,21]: low rates of mental illness, high rates of impulsiveness, and a very high proportion of attempts by pesticide ingestion. This profile is, however, similar to that reported in other studies from China.[22-24]

One unexpected finding was the high proportion of respondents (41%) who reported that the main goal of the attempt was to ‘control the behavior of others’; this highlights the function of suicidal behavior in rural China as a means for dealing with interpersonal conflict. Another surprising finding was the complete absence of alcohol use disorders in any of the suicide attempters; this may be due to the high proportion of females in the sample and the very low reported rates of alcohol use problems in women in China.[25]

This is the first study in China of attempted suicide that we know of which matched cases and controls by age, gender, and location of residence and, thus, adjusted for these major determinants of suicidal behavior. However, the risk factors identified after this adjustment were similar to those reported for studies that did not match cases and controls.[22,23,26,27] The severity of depressive symptoms in the two weeks prior to the attempt – whether or not the individual met criteria for a depressive disorder – was the most important risk factor for suicide attempt. Multiple negative life events over the prior year and low quality of life in the month before the attempt were also important predictors of subsequent suicidal attempt. And having associates in one’s environment who have had suicidal behavior increases the likelihood that an individual will use this method to deal with difficulties. Family conflict is a common negative life event in persons who attempt suicide; this study quantified family function using the FACES-II-CV and found that these measures of family function were independent predictors of suicide attempt. Despite the very narrow range of educational

| Table 3. Stepwise multivariate Cox regression analysis of potential risk factors for medically serious suicide attempt in 276 case-control pairs from rural Shandong Province, China |
|-----------------------------------------------|
| Variables                              | OR    | 95% CI          |
| High depression symptom score in last two weeks | 8.81  | 2.65-29.32 |
| Low quality of life in last month        | 2.69  | 1.53-4.72 |
| Relative or associate with prior suicidal behavior | 2.14  | 1.27-3.58 |
| Four or more negative life events in last year | 1.79  | 1.05-3.08 |
| Low family cohesion over last month      | 1.78  | 1.05-3.01 |
| Years of formal education                | 0.79  | 0.70-0.89     |

*Potential risk factors not considered in this model include gender, age, and location of residence (excluded by the matched design); prior suicide attempt (excluded because controls were excluded if they had made a prior attempt); acute stress (which was only present in the case, not in the controls); and impulsiveness and aggression (which were only assessed in a subset of subjects). All other factors that were significant in the univariate analysis (Table 2) were considered in this model. The analysis was conducted using both forward and backward stepwise methods (to confirm the stability of the result).
achieved (and controlling for age) in this rural sample, fewer years of formal education remained an independent risk factor for suicide attempt. However, income level, which also varied in a narrow range in this sample of rural farmers, was not associated with suicide attempts.

Two important factors identified in the univariate analysis could not be included in the multivariate analysis. Among the cases, 77% experienced an acute negative life event in the 2 days prior to the attempt while none of the controls experienced such an event in the 2 days prior the interview. And the assessed level of impulsiveness and aggression (only assessed in about one-third of subjects) was much higher in the case group than in the control group. These factors are clearly very important in the pathway to suicidal behavior but it was not possible to determine their relative importance compared to the factors that were identified in the multivariate analysis. More detailed research will be needed to clarify the inter-relationships of these factors.\[27\]

Another key finding is that there are few differences between the characteristics and risk factors for fatal and non-fatal suicidal behavior in rural residents.\[28-30\] The proportion of those who die of suicide who have a diagnosable mental illnesses is higher than the proportion of persons with non-fatal suicidal behavior who have a mental illness (60%[28] v. 38%), but for both fatal and non-fatal suicidal behavior the severity of depressive symptoms is a stronger predictor of suicidal behavior than the presence of a mental illness and the pattern of other risk factors for both types of suicidal behavior is very similar. This finding supports previous reports about the substantial overlap between these two forms of suicidal behavior in rural China\[31\] – possibly driven by the frequent use of pesticides as a suicidal method – and is a probable explanation for China’s unique demographic pattern of suicide with much higher rates in rural areas than in urban areas and similar rates in men and women.\[23\] This also suggests that interventions aimed at reducing rates of suicide attempts may directly reduce rates of suicide fatalities.

### 4.2 Limitations

The sample is selected from a single county-level general hospital, so it is impossible to say how representative these cases may be of medically treated suicide attempts elsewhere in the country. The requirement that the cases be hospitalized for a minimum of six hours limits the cases – and the interpretation of the results – to medically serious suicide attempts. The main demographic differences in suicide rates in China are by location of residence, gender and age\[24\] so we designed a matched study in rural China that would identify potential risk factors after adjusting for these factors; however, adjusting for these factors by matching meant that we were unable to consider potential interactions between these factors and other potential risk factors. Moreover, there were other factors that we were not able to include in the multivariate analysis that, if included, may have changed the pattern of the factors that were identified: prior suicide attempt, acute stress at the time of the attempt, and impulsive and aggressive personality traits. Finally, the data are from a study conducted a decade ago, so the pattern of risk factors in rural suicide attempts may have changed as the overall rates of suicide in the country have dropped in the country.\[22\]

### 4.3 Significance

These results confirm those from other studies in China that highlight the unique characteristics of suicidal behavior in rural China. Many of the medically treated suicide attempts in rural China are low-intent attempts by the ingestion of pesticides in persons who do not meet criteria of a mental disorder but have high levels of impulsiveness and aggression. Nevertheless, the pattern of independent risk factors identified in the multivariate analysis is not all that different from that seen elsewhere: family dysfunction, multiple negative life events, exposure to others who have had suicidal behavior, and low educational status. But, as has been shown in studies of completed suicide in China, in this study the current level of depressive symptoms was a more important risk factor for suicidal behavior than the presence of a diagnosable mental illness.

The relatively low rate of mental illness in individuals who attempt suicide in rural China (38%) dictates a different approach to the prevention of suicidal behavior than that used in high-income countries. Suicide prevention efforts should be less focused on the identification and treatment of mental disorders and more focused on limiting access to agricultural poisons and training impulsive individuals about self-regulation of their emotions and behaviors. Developing and testing these types of interventions should be a high priority for suicide researchers in the country.

### Conflict of interest

The authors report no conflict of interest related to this paper.

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中国农村严重自杀未遂危险因素的配对病例对照研究

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摘要

背景 中国农村的自杀率是城市自杀率的 2-3 倍，但造成城乡自杀率之巨大差异的原因并不清楚。

目的 评估国内农村严重自杀未遂者的特征及危险因素。

方法 精神科医生采用结构式问卷对山东郓城县人民医院急诊室收治的 297 例严重自杀未遂者（至少在医院 6 小时者）及其陪伴的家属分别进行访谈。该问卷内容详尽，完成问卷需要 2~3 h。对照组选取同一居住地中年龄、性别与自杀未遂组相匹配的、既往无自杀未遂史的居民及其同住家庭成员，分别进行同样的结构式访谈。使用Cox回归模型来识别自杀未遂的危险因素。

结果 297 例自杀未遂者中，74% 为女性，78% 是农民，平均（标准差）年龄为 33.2（14.6），平均受教育年限 4.8（3.1）年，80% 为口服农药自杀，57% 的自杀未遂者报告在采取自杀行动之前考虑自杀只有或不足 5 分钟，76% 的自杀意图量表中计划分量表得分不足 50 分（0~100 分），11% 有过自杀未遂史，只有 38% 存在符合DSM-IV诊断标准的精神障碍。在控制性别、年龄、居住地以及之前的自杀未遂史（在配对分析中控制该变量）后，通过多因素分析，自杀未遂的危险因素包括：受教育水平低、与有过自杀行为的人交往、之前 1 年中至少有 4 次负性生活事件、之前 1 个月中生活质量低且家庭不够和睦、之前 2 周内的抑郁症状得分高以及冲动性和攻击性高（最后一项仅在小样本中进行评估）。

结论 我国农村严重自杀未遂者多数不符合精神障碍的诊断标准，冲动性和攻击性高、自杀意图并不强烈，多采用口服农药的方式。这些特点与高收入发达国家的特点不同，因而需要采取不同的方法来预防自杀行为。这些方法应更多的关注如何降低获取农药的便利性，并教育冲动性个体如何自我调整情绪和行为，而不是过度地关注精神障碍的识别和治疗。