



## Prevalence of psychiatric diagnoses in individuals who die by suicide or attempt suicide in China based on independent structured diagnostic interviews with different informants



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### ABSTRACT

Many individuals who die by suicide or attempt suicide have no pre-existing psychiatric record. In these cases determination of the presence of mental illness at the time of the suicidal act depends on diagnostic interviews with different informants, but the reliability of such interviews is unknown. To address this issue, the current study from northern China conducted independent diagnostic interviews (by different psychiatrists) with a co-resident family member and another associate of 151 suicide decedents, with 120 individuals who attempted suicide, and with two proxy informants for each suicide attempter. In the suicide decedent group, 56% of interviews with family members and 50% with other associates resulted in one or more psychiatric diagnosis; the concordance (kappa) of these two respondents for the presence of any current psychiatric disorder, any mood disorder and any other psychiatric disorder were 0.35, 0.32 and 0.41, respectively. In the suicide attempt group, 47% of interviewers with suicide attempters, 31% with family members, and 15% with other associates resulted in a psychiatric diagnosis; the concordance for any current psychiatric disorder, any mood disorder and any other psychiatric disorder between the interview with the suicide attempter and the combined result of the two separate proxy informant interviews were 0.31, 0.34 and 0.39, respectively. We conclude that the concordance of the presence and type of psychiatric diagnosis of individuals with suicidal behavior based on independent structured interviews by psychiatrists with different informants is low to fair and that using multiple informants will increase the identification of psychiatric disorders.

### 1. Introduction

Almost all case-control studies on suicide conducted in both high-income countries (HICs) and low-and middle-income countries (LMICs) identify psychiatric illness as one of the most important risk factors for suicidal behavior (Cheng et al., 2000; Phillips et al., 2002; Wærn et al., 2002; Arsenaault-Lapierre et al., 2004; Schneider et al., 2006; Wong et al., 2008; Zhang et al., 2010; Hirokawa et al., 2012; Lahti et al., 2014; Tong et al., 2016; Nock et al., 2017). However, for some suicides and suicide attempts in high-income countries (HICs) and for most suicides and suicide attempts in low- and middle-income countries (LMICs) there is no history or record of prior mental health treatment (Phillips et al., 2002), so determining the presence of a psychiatric illness at the time of the suicidal act is, necessarily, dependent on postmortem interviews with proxy informants for suicide decedents or on post-

attempt interviews with the suicide attempters and/or their proxy informants.

Evidence about the validity of using interviews with proxy informants to retrospectively determine the presence of a psychiatric disorder in persons who die by suicide – called a ‘psychological autopsy’ (Hawton et al., 1998) – is mixed. Studies in HICs about suicide decedents who had previously received psychiatric care find that the diagnosis obtained from interviews with family members after a suicide are concordant with that determined prior to death (Kelly and Mann, 1996; Deep-Soboslay et al., 2005), but these results may be biased because family members knew about the previous diagnosis and integrated that into their subsequent ‘narrative’ about the suicide. Another way of assessing the validity of proxy-based reports of psychiatric illness in persons with suicidal behavior is to compare the results of diagnostic interviews with individuals who have recently made a suicide attempt

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to the results of independent interviewers with proxy informants (typically family members or close associates) of the individual who made the suicide attempt; some reports on these types of comparisons show fair-to-moderate concordance of diagnoses based on self-reports and diagnoses based on proxy reports (Conner et al., 2001; Zhang et al., 2003), while other reports find poor concordance (Schneider et al., 2004). However, this method of assessing the validity of diagnoses based on proxy-informant interviews is not fully equivalent to the suicide autopsy situation because the suicide attempter and proxy informants are either reporting on the individual's *current* psychological status (when the evaluation is done immediately after the suicide attempt – in which case recall bias is not a significant issue) or expected to recall the individual's prior psychological symptoms (when the evaluation is done some time after the suicide attempt – in which case recall is confounded by more recent experiences with the individual). In contrast, in suicide autopsy studies the time interval between death and the diagnostic interview can be up to two years, resulting in both recall bias and 'reconstructed narratives' by proxy informants.

Given the frequent under-reporting (or frank denial) of prior psychological symptoms in individuals with suicidal behavior in LMICs (Phillips et al., 2002), one method of increasing the identification of psychiatric disorders in these individuals is to conduct separate diagnostic interviews with different informants and then consider a diagnosis present if identified based on any of the interviews. Several psychological studies of suicide in China have adopted this approach (Phillips et al., 2002; Zhang et al., 2010; Tong et al., 2016) because the risk of under-diagnosis is considered much greater than the risk of over-diagnosis. However, the utility of this approach has not been assessed and the concordance of diagnostic interview results from different informants is unknown. The current study aims to 1) determine whether or not combining diagnostic results based on interviews with different proxy informants increases the identification of psychiatric diagnoses among suicide decedents and suicide attempters in China; 2) assess the concordance of the diagnostic results of interviews with different proxy informants of suicide decedents and suicide attempters; 3) assess the concordance of interviews with suicide attempters with that of their proxy informants; and 4) identify characteristics that are associated with the degree of concordance of self-report interviews and proxy-report interviews of individuals who have recently made a suicide attempt.

## 2. Methods

### 2.1. Samples

One rural county from each of four of China's 31 provinces – Shaanxi, Sichuan, Hebei, and Inner Mongolia – was selected for the study. Consecutive decedents 18 years of age and older reported in the death registry system of the 4 counties between 2008 and 2011 with the cause of death listed as suicide, other injury or mental illness were screened for eligibility and 151 of them who had a confirmed cause of death as suicide were enrolled in the study. Registries of attempted suicide were established at general hospitals in the 4 counties and 120 individuals 18 years of age or older treated for suicide attempt in the emergency departments of these hospitals were enrolled in the study. For each case, one family member and another non-family member (e.g., neighbor, village doctor, or friend) were interviewed separately by different psychiatrists. The suicide attempters themselves were also interviewed by a different psychiatrist. All interviews were conducted at the respondent's home. The proxy respondents of suicide decedents were interviewed within 12 months of the death, and the suicide attempters and their proxy respondents were interviewed within 6 months of the index suicide attempt. The details of the sampling method and interview procedures have been described in a previous paper (Tong et al., 2016).

The study was approved by the institutional review board of the

Beijing Hui Long Guan Hospital. All participants provided written informed consent.

### 2.2. Measures

The Chinese version of the Structured Clinical Interview for DSM-IV (SCID-I, First et al., 2002) was used for the diagnostic interview. The wording of probes used in the SCID-I were adapted for use with proxy respondents. Interviews focused on the experiences, symptoms and functioning of the target individual prior to death or prior to the index suicide attempt. SCID-I interviews were conducted by psychiatric interviewers trained for 10 days in the use of the Chinese version of SCID-I before the start of the study; to be an approved interviewer for the project each psychiatrist had to correctly identify the diagnosis of 10 videotaped mock interviews and successfully conduct a complete SCID-I interview with a mock patient.

The analysis is based on *current* diagnoses – any psychiatric diagnosis that was present in the month prior to the suicidal act. All current psychiatric diagnoses in SCID-I, including comorbid diagnoses, were recorded. Each separate interview generated a diagnostic result. The results of the two proxy informants were combined into a 'proxy-based' diagnosis by 'scaling up', that is, a diagnosis present in either of the two proxy interviews was coded as 'present' in the combined 'proxy-based' diagnosis. In the small number of cases where only one of the two proxy respondents was interviewed (6 of the 120 suicide attempts and 4 of the 151 suicide deaths), the diagnosis generated from the single proxy interview was considered the proxy-based diagnosis.

Other information collected on each case included gender, age, and years of education of the target individuals and of their proxy informants; the relationship between the case and each proxy; the duration of time the proxy knew the case; and the number of days the proxy had contact with the case in the 7 days prior to the suicidal act.

### 2.3. Statistical analysis

Specific diagnoses were separated into three groups: any current psychiatric disorder; any current mood disorder; and any current other (non-mood) disorder. Data analysis was conducted using SPSS. McNemar's test and Cohen's kappa (Landis and Koch, 1977) were used to compare the prevalence of psychiatric diagnoses and to assess the concordance of the diagnoses generated by interviews with different informants. Kappa values ranging from 0.21 to 0.40 reflect low to fair agreement, 0.41 to 0.60 moderate agreement, 0.61 to 0.80 substantial agreement, and > 0.80 excellent agreement (Landis and Koch, 1977).

The prevalence of the three classes of diagnoses between five different types of proxy informants is compared using standard (unmatched) Chi square tests, and subsequent multiple comparisons between different pairs of respondents are made using a Tukey-type arcsine transformation of the crude proportions (Zar, 1999).

Generalized estimating equations (GEE) were used to identify factors associated with disagreements between the diagnostic result of interviews with the suicide attempters themselves and the combined proxy-based diagnostic result of interviews with two proxy informants for each suicide attempter. This method controls for the fact that the psychiatric diagnosis generated from the different interviews are correlated. In this analysis, the binomial dependent variable was whether or not the two diagnoses are concordant, characteristics of the proxy informants were independent variables, and each matched pair of diagnostic results was treated as a 'within subject' variable.

## 3. Results

### 3.1. Characteristics of the samples

Demographic characteristics of suicide decedents, suicide attempters, and different types of proxy informants are shown in Table 1. Only

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