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Lifetime prevalence of suicide ideation, plan, and attempt in metropolitan China

Lee S, Fung SC, Tsang A, Liu ZR, Huang YQ, He YL, Zhang MY, Shen YC, Nock MK, Kessler RC. Lifetime prevalence of suicide ideation, plan, and attempt in metropolitan China.

Objective: This is the first community-based epidemiological study examining the prevalence of suicidal behaviors, their transitional pathways, and their relationship with mental disorders in metropolitan China.
Method: Suicidal behaviors, including ideation, plans, and attempts were assessed by face-to-face household interviews among 5201 respondents in Beijing and Shanghai in 2001–2002. Lifetime prevalence and risk factors were examined using multivariate discrete-time survival models.
Results: The lifetime prevalence estimates of suicidal ideation, plans, and attempts were 3.1%, 0.9%, and 1.0% respectively. Among suicide ideators, the conditional probability of ever making a plan and an attempt was 29.5% and 32.3% respectively. Progression from ideation to plan and attempt was the highest during the first year after onset. Suicide attempt was predicted by young adulthood, being unmarried, recent onset of ideation and plan, and the presence of mental disorders, especially mood disorder.
Conclusion: Suicidal behaviors in metropolitan China exhibit a low prevalence and an epidemiological profile resembling that found in Western countries.

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Key words: suicide; attempted; prevalence; community; mental disorders; urban population; China

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Significant outcomes

- This community study of suicide pathways in urban China confirms correlates of suicide found in other countries, such as female sex, young age, low education, and being unmarried. These correlates may be shaped by methods of suicide in urban China.
- The risk of suicide attempt is the highest in the first year of onset of ideation and plan while having a plan increases the risk of a subsequent attempt. Age/cohort may affect these pathways.
- Mood and anxiety disorders predict suicidal behaviors strongly while impulse-control and substance use disorders are strongly associated with suicide attempt.

Limitations

- The results are only representative of urban areas of China because about 75% of the country is rural.
- Suicidal behavior was assessed by retrospective self-report without independent validation and thus is subject to report bias.
- Other important suicide-related variables such as methods of suicide attempt, strength of suicide intent, non-suicidal self-injurious behaviors were not examined.

Introduction

Suicide is an important health issue in China; most prior studies have investigated mortality rates in completed suicide. The findings of these studies are of both theoretical interest and public health importance. However, they are less relevant for suicide prevention because completed suicide is

only the end of a spectrum of suicidality that begins as early as the moment when a suicidal idea first appears. Western studies have demonstrated that various factors may affect how a suicidal idea may progress to an attempt (1), such as the presence of mental disorders (2). Such studies are rare in China.

China exhibits a high annual national suicide rate of 23/100 000 and certain patterns of suicide less commonly recognized in the West. For example, suicide in the country varies with rural vs. urban location and sex. It has been reported that the suicide rates in urban Beijing (3–6/100 000) are lower than those in rural Beijing (9–15/100 000) (3). This rural-to-urban ratio (2–5 times) is higher than those typically found in Western communities (1–3 times) (4–6). Moreover, the Chinese female-to-male ratio of suicide is atypically low (1.25 : 1) compared with those found in Western countries (2.5–4.0 : 1) (7, 8). Finally, completed suicide has been found to be less frequently associated with mental disorders, such as depression, than in Western communities (9, 10).

As suicide behaviours are heterogeneous in China and not always lethal (11), suicide prevention policy and programs must rest on more than mortality statistics. This is because studies based primarily on injury-related death statistics and/or psychological autopsy research may underestimate, and fail to provide important information about, the full range of suicidal behaviors and their correlates in the community.

Some studies on suicidal behaviors in China have examined psychiatric patients, hospital emergency department records, or specific sociodemographic groups like adolescents (9, 10, 12). To our knowledge, there is only one stringent community-based epidemiological survey of the prevalence of suicide ideation, plan and attempt in China (13). This was part of a cross-national community survey on suicidal behavior and was conducted in a rural area of China known as Yuncheng. It found that 18.5%, 7.4%, and 2.4% of a clustered sample of rural people (n = 503) had ever thought about making a suicide attempt, made a plan and attempted suicide respectively (13). It also revealed a lower attempt-to-plan ratio (1 : 3.1 vs. 1 : 4.6 – 1 : 0.7) and a lower attempt-to-idea ratio (1 : 7.7 vs. 1 : 7.5 – 1 : 1.6) than most of the other participating countries. While this study is of interest in showing the variability of Chinese suicidal behaviors, its small sample might not be representative of rural China in general. More importantly, it did not examine psychiatric correlates and the transitional pathways among suicidal behaviors (1, 2). As such, the prevalence and correlates of non-lethal suicidal behaviors in China, especially in urban areas, remain unknown. Yet, such information is needed to inform scientific, clinical and policy decisions about this dangerous mental health problem.

Aims of the study

The present study aims to: i) estimate the lifetime prevalence of suicide ideation, plan and attempt in a representative urban Chinese population, ii) examine the sociodemographic and diagnostic correlates of suicidal behaviors, and iii) demonstrate how these factors may influence the transition from suicide ideation to suicide attempt in the presence or absence of suicide plan.

Material and methods

The study was conducted in metropolitan China as part of the WHO World Mental Health (WMH) Survey Initiative (14). It was based on a multi-stage clustered area probability sample of household-dwelling adults aged 18–70 in eight metropolitan districts of Beijing and 12 metropolitan districts of Shanghai. A total of 5201 respondents including 2633 in Beijing and 2568 in Shanghai were interviewed by trained interviewers between November 2001 and February 2002 using the World Mental Health Survey version of Composite International Diagnostic Interview (WMH-CIDI). Development of the Chinese survey instrument, sampling method, training and fieldwork procedures were described in detail elsewhere (15, 16).

The interview consisted of two parts. Part I was administered to all 5201 respondents to estimate the 12-month and lifetime prevalence of mental disorders using the WMH-CIDI diagnostic assessment. Part II assessed suicidal behaviors, risk factors, psychosocial correlates and additional demographic information. The part II interview was administered to all part I cases with a lifetime history of any of the mental disorders and a probability subsample of one-fourth of other part I respondents, for a total part II sample of 1628 people. The part II sample was weighted to adjust for the under-sampling of people without a lifetime mental disorder. An additional weight was used to adjust for the fact that only one respondent was interviewed in each household regardless of household size. A third weight, finally, was used to adjust the sample to correct for minor discrepancies between the sample and the population on the cross-classification of age, sex, and neighborhood population size. The response rates were 74.8% for

Beijing and 74.6% for Shanghai. We combined data from the two cities to increase the power of analysis (16).

Procedure

Written consent was obtained from all respondents prior to the interview. The suicidal behavior Section was included in the part II interview. Suicidal behaviors were defined as suicide ideation ('Have you ever seriously thought about committing suicide?'), suicide plan ('Have you ever made a plan for committing suicide?'), and suicide attempt ('Have you ever attempted suicide?'). Based on the evidence that self-report responses of potentially embarrassing behaviors, in this case suicidal behaviors, were higher in self-administered than interviewer-administered format, these questions were printed in a self-administered booklet, and the responses were referred to by letters. For each of the suicidal behaviors, information was obtained about the age at first occurrence and the recency of occurrence.

Suicidal behaviors were then analyzed in relation to three sets of risk factors including sociodemographic factors, age of onset, and prior DSM-IV mental disorder(s). The sociodemographic data and onset information were all categorized into ordinal data. Sociodemographic factors included sex, age/cohort (18–34, 35–49, 50–64, 65+), education (low, low/medium, medium, high), employment (before first employment, after first employment), and marital status (before ever married, after ever married). The onsets of suicidal behaviors included age of onset of ideation (early, middle, and late), number of years since onset of ideation (0, 1–5, 6–10, 11+), presence of suicide plan (yes, no), and number of years since onset of plan (0, 1–5, 6–10, 11+).

The diagnoses of lifetime mental disorders were assessed using the Diagnostic Sections of the WMH-CIDI (17). The disorders included in this analysis were anxiety (generalized anxiety disorder and specific phobia), mood (major depressive episodes), impulse-control (intermittent explosive disorder), and substance use (alcohol abuse) disorders. Organic exclusion rules and diagnostic hierarchy rules were used in making all respondent diagnoses. Blinded clinical reappraisal interviews with a mixed sample of 95 in-patient and out-patient psychiatric patients and 77 normal controls using the Structured Clinical Interview for DSM-IV [SCID; (18)] to generate diagnoses found good concordance with the CIDI diagnoses of anxiety, mood, and substance use disorders (15).

Data analysis

Cross-tabulations were used to estimate the lifetime prevalence rates of suicide ideation, plans, and attempts. Discrete-time survival analyses with time-varying covariates (19) were used to study sociodemographic risk factors of suicide ideation, plan, and attempt. Continuous variables were divided into categories to minimize effects of extreme values. Coefficients were converted to odds ratios (ORs) for ease of interpretation and 95% confidence intervals (CIs) were also reported. The Taylor series method (20) implemented in the SUDAAN software system (21) was used to adjust for the effects of weighting and clustering of all data on significance tests. Multivariate associations were evaluated with Wald chi-square tests. All tests above were performed by including the weight. Statistical significance was based on two-sided tests evaluated at the 0.05. In epidemiologic studies, commonly used corrections to alpha levels that reduce the likelihood of a type I error (e.g. Bonferroni procedure) are not optimal because with the large number of tests conducted using a single database such corrections can be overly restrictive and have the undesirable effect of increasing the likelihood of a type II error. In the present study, in order to decrease the likelihood of interpreting results that were statistically significant due to chance as true effects, we conducted global significance tests for each set of analyses and only interpreted individual coefficients if the global test is significant, and only interpreted effects that showed consistency across analyses, as described below.

Results

Lifetime prevalence of suicidal behaviors

The lifetime prevalence estimates of suicidal ideation, plans and attempts were 3.1%, 0.9%, and 1.0% respectively (Table 1). Females had higher lifetime prevalence than males of all three behaviors. Among ideators (n = 160), the conditional probability of ever making a plan and an attempt was 29.5% and 32.3% respectively. The conditional probability of ever making an attempt was higher among ideators with a plan (47.1%) than those without a plan (26.1%).

Onset distributions

Figure 1 shows age-of-onset curves for first occurrence of suicide ideation, plans, and attempts. Cumulative probability of suicidal ideation and

Table 1. Lifetime prevalence of suicide-related outcomes in metropolitan China

	Female	Male	Total
Total sample size	2668	2533	5201
Ideation			
n	98	62	160
% (95% CI)	4.0 (3.0–5.0)	2.3 (1.7–2.9)	3.1 (2.7–3.5)
Plan			
n	26	16	42
% (95% CI)	1.1 (0.5–1.7)	0.8 (0.4–1.2)	0.9 (0.5–1.3)
Attempt			
n	28	21	49
% (95% CI)	1.3 (0.7–1.9)	0.7 (0.3–1.1)	1.0 (0.6–1.4)
Ideator sample size	98	62	160
Plan among ideator			
n	26	16	42
% (95% CI)	26.7 (16.9–36.5)	33.9 (17.4–50.3)	29.5 (20.5–38.5)
Attempt among ideator			
n	28	21	49
% (95% CI)	33.2 (20.7–45.7)	30.8 (16.7–44.9)	32.3 (22.7–41.9)
Ideator without lifetime plan	72	46	118
Attempt			
n	15	13	28
% (95% CI)	25.9 (13.0–38.8)	26.6 (13.7–39.5)	26.1 (16.9–35.3)
Ideator with lifetime plan	26	16	42
Attempt			
n	13	8	21
% (95% CI)	53.5 (30.5–83.9)	39.0 (8.8–69.2)	47.1 (27.5–74.6)

plans increased in a roughly linear fashion from the early teens through late middle, while there was a noticeable non-linearity for attempts associated with the slope increasing beginning at fifty years of age. Ideation occurred somewhat earlier than plans and plans occurred somewhat earlier than attempts. Median age of onset was in the early to middle 30 years of age for ideation and plans and in the early fifty years of age for attempts.

Conditional age-of-onset curves (Fig. 2) show that progression from ideation to plan, and from ideation to first attempt in the absence of plan were all higher in the first year of onset of ideation than in subsequent years. Although the progression from plan to attempt was high in the first year of onset of plan, the progression continued after two decades following the first year of onset.

Sociodemographic predictors

Females had significantly higher odds than males for suicidal ideation, but the two genders did not differ significantly with regard to plan and attempt (Table 2). Younger people (aged 18–34 years) had consistently higher odds of ideation, plan, and attempt compared with the reference group (aged 65 or over). Being unmarried was associated with higher odds of ideation than those being married, although the relation between marital status and plan and attempt was not significant. There was no significant association between employment or education and suicidal behaviors. The finding of four significant chi-square tests among only 15 conducted, which is significantly more than would be expected by chance alone, and the consistency of the observed relations suggest these findings are robust.

To examine the risk factors for transition from plan to attempt, suicide attempters were further classified into those who had plans and those without plans. The findings indicate that having a plan was significantly associated with subsequent attempt ($\chi^2_1 = 4.5$, $P < 0.05$). The transition from ideation to first onset of an attempt without

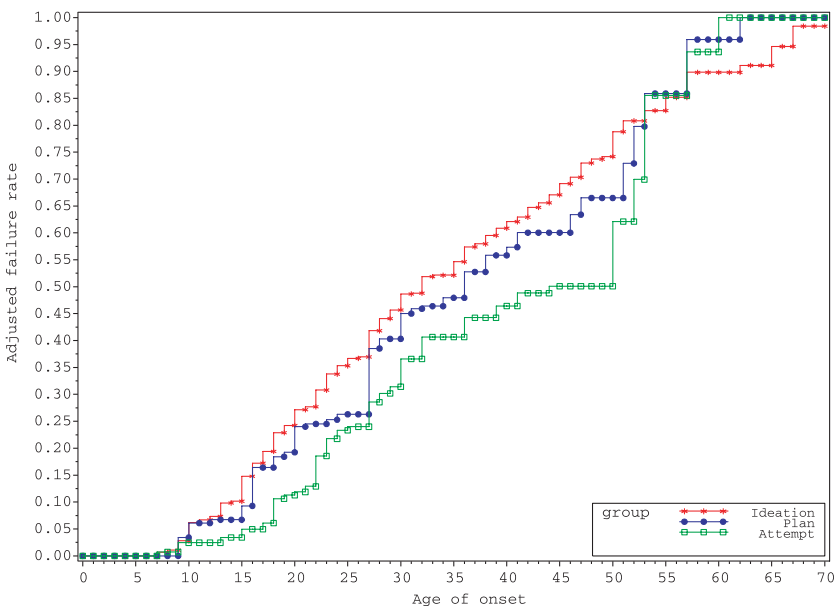

Fig. 1. Failure rate of first suicide ideation, plan and attempt for metropolitan China.

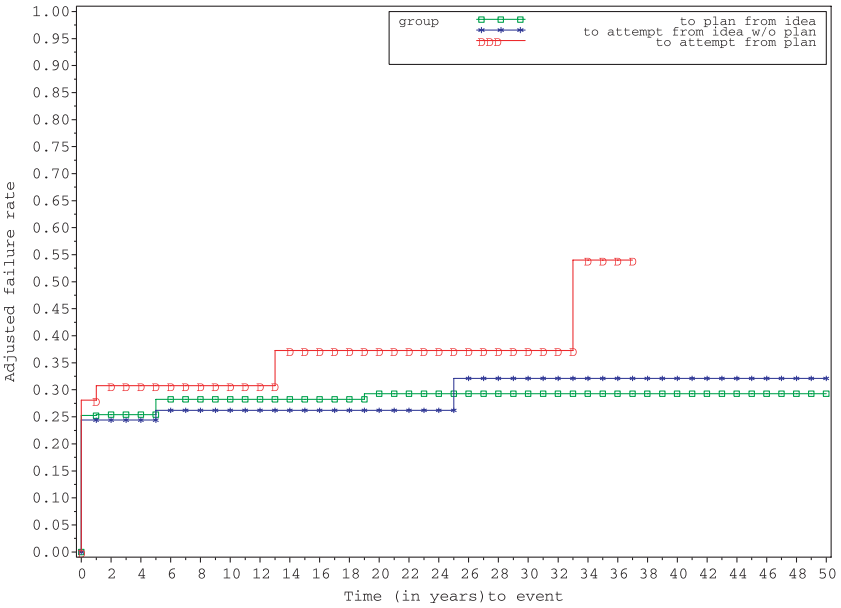

Fig. 2. Failure rates for suicide transitions in metropolitan China.

Table 2. Sociodemographic risk factors for first onset of suicidal behaviors in metropolitan China (n = 1619)†

		Ideation		Plan		Attempt	
Sociodemographic	Categories	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Sex	Female	1.7*	(1.1–2.6)	1.4	(0.5–3.5)	1.8	(0.8–4.0)
	Male	1.0	–	1.0	–	1.0	–
	χ^2_1 [P]	6.4** [0.01]		0.5 [0.49]		2.1 [0.15]	
Age/cohort	18–34	5.6*	(1.7–17.8)	25.8*	(4.5–147.4)	8.5*	(1.3–54.4)
	35–49	2.3	(0.8–6.9)	9.7*	(1.8–51.3)	4.5	(0.9–22.2)
	50–64	2.3	(0.8–6.1)	2.5	(0.4–14.8)	5.0	(0.8–31.8)
	65+	1.0	–	1.0	–	1.0	–
	χ^2_3 [P]	11.5** [0.01]		20.6** [$P < 0.01$]		5.5 [0.14]	
Education	Low	1.1	(0.4–3.2)	4.9*	(1.3–19.4)	2.3	(0.7–7.6)
	Low/medium	0.7	(0.4–1.5)	2.1	(0.6–7.7)	1.7	(0.6–5.2)
	Medium	1.1	(0.5–2.3)	0.7	(0.3–1.9)	2.0	(0.8–4.9)
	High	1.0	–	1.0	–	1.0	–
	χ^2_4 [P]	3.3 [0.52]		11.2 [0.02]		3.9 [0.42]	
Employment	Before 1st employment	1.2	(0.5–2.8)	0.9	(0.3–2.3)	0.7	(0.2–2.7)
	After 1st employment	1.0	–	1.0	–	1.0	–
	χ^2_1 [P]	0.2 [0.65]		0.1[0.79]		0.3 [0.56]	
Marriage	Before ever married	2.2*	(1.3–3.8)	1.9	(0.5–7.9)	2.2	(0.9–5.2)
	After ever married	1.0	–	1.0	–	1.0	–
	χ^2_1 [P]	8.7** [$P < 0.01$]		0.8 [0.36]		3.6 [0.06]	

Results are based on multivariate discrete-time survival model with person-year as the unit of analysis.
†This is based on the Part II sample.
*OR significant at the 0.05 level, two-sided test.
**Significant at the 0.05 level, two-sided test.

a lifetime plan (i.e. an impulsive attempt) was markedly elevated within the first year of onset of ideation (OR = 585.7; CI = 97.5–3517.9), and decreased substantially thereafter (OR = 0.0 for 6–10 years after onset of first ideation).

Lifetime DSM-IV disorders as predictors

The relation between the presence of each DSM-IV disorder assessed and first onset of suicidal behaviors is presented in Table 3. These estimates (reported as odds ratios and statistically controlled for the sociodemographic variables listed in Table 2) show that the presence of anxiety disorders (OR = 1.9–18.5) and mood disorders (OR = 17.8–50.0) were associated with significantly higher odds of suicidal ideation, plan, and attempt, and the effects were especially strong for mood disorders. Impulse-control disorders and substance use disorders were not significantly

Table 3. DSM-IV disorders as risk factors for first onset of suicidal behaviors in metropolitan China (n = 1619)†

	Ideation		Plan		Attempt	
Disorder categories	OR	95% CI	OR	95% CI	OR	95% CI
Anxiety disorders						
Generalized anxiety disorder	7.0*	(1.9–26.2)	16.9*	(2.7–106.2)	18.5*	(3.5–97.4)
Specific phobia	1.9*	(1.0–3.6)	2.9	(0.4–18.7)	2.6	(0.7–9.0)
Any anxiety disorders	2.8*	(1.4–5.7)	5.2*	(1.2–21.4)	4.3*	(1.4–13.6)
Mood disorders						
Major depressive episode	17.8*	(8.6–36.8)	50.0*	(16.8–142.9)	46.4*	(16.0–134.6)
Any mood disorders	16.4*	(8.1–33.2)	46.3*	(16.3–131.1)	42.3*	(15.6–114.5)
Impulse-control disorders						
Intermittent explosive disorder	2.6	(0.8–8.3)	3.7	(0.9–15.3)	6.8*	(1.7–26.8)
Any impulse-control disorders‡	4.2	(0.8–22.2)	12.2*	(2.6–57.8)	14.1*	(2.7–76.4)
Substance use disorders						
Alcohol abuse	1.7	(0.4–6.9)	0.3	(0.0–2.6)	2.7	(0.3–24.2)
Any substance use disorders	2.7	(0.7–10.1)	2.1	(0.2–18.2)	5.7*	(1.4–22.5)
No. of mental disorders						
Any disorders	4.3*	(2.4–7.8)	10.5*	(3.3–33.8)	11.0*	(4.9–24.5)
Exactly 1 disorder	2.7*	(1.3–5.7)	5.9*	(2.0–18.1)	4.6*	(1.8–11.7)
Exactly 2 disorders	3.0*	(1.1–8.4)	2.7	(0.3–20.7)	6.0*	(1.7–21.2)
3+ disorders	10.2*	(3.3–31.9)	21.3*	(5.0–89.8)	23.8*	(6.3–90.7)

Results are based on multivariate discrete-time survival model.
*OR significant at the 0.05 level, two-sided test.
†This is based on the part II sample.
‡Assessed within age range 18–44.

associated with ideation, but were more strongly and significantly associated with attempt. While the presence of any lifetime mental disorder was associated with higher odds of ideation (OR = 4.3), plan (OR = 10.5) and attempt (OR = 11.0), the presence of three or more lifetime mental disorders significantly increased the risks for ideation (OR = 10.2), plan (OR = 21.3), and attempt (OR = 23.8). In these analyses, the fact that 38 out of 39 ORs were greater than one, that 28 out of 39 ORs were statistically significant, and that strong consistency was observed in the pattern of ORs for each disorder examined suggests these findings are robust.

In further examining the relation between mental disorders and planned vs. unplanned (i.e. impulsive) attempts, we found that major depressive episode (OR = 65.6; CI = 1.9–2309.5) increased the risk for planned attempt, whereas alcohol abuse (OR = 39.3; CI = 1.5–1028.4), intermittent explosive disorder (OR = 13.4; CI = 1.0–185.1), and generalized anxiety disorder (OR = 11.3; CI = 1.2–109.4) increased the risk of unplanned attempt. Considering the high comorbidity among the above disorders, they were re-analyzed in one survival analysis model with the control of sociodemographic variables, so as to investigate whether higher risk of suicide outcomes associated with one mental disorder was contributed by a comorbid mental disorder. Major depressive episode was found as the unique factor associated with higher risk of suicide outcomes (ideation: OR = 5.1, CI = 1.4–17.7; plan: OR = 8.8, CI = 1.6–48.9; attempt: OR = 9.1, CI = 21–38.7), while other mental disorders were insignificant in the same model. Higher risk of suicide outcomes is also associated with having three or more disorders (further details were available upon request).

Discussion

Findings in the Chinese context

This study shows that suicidal behaviors are not uncommon in metropolitan China. The lack of previous community-based research precludes us from concluding whether suicidal behaviors in urban China have increased or decreased in response to the country's rapid socioeconomic change. That females exhibit higher lifetime prevalence than males of suicidal ideation could be ascribed to a higher rate of depression among women (7), their social disadvantage, greater tendency to communicate distress via the appeal function of non-lethal suicidal behaviors, or other unknown reasons (22, 23). Nonetheless, the insignificant gender difference in suicide plan and attempt is compatible with the finding that completed suicide rate is about equal between the two genders, or only modestly higher for males, in urban China (3).

In keeping with hospital-based studies of suicide attempters in China (8, 10), we found young adults (aged 18–34) having higher risks of ideation and plan than older ones. Although young age is a globally recognized risk factor for suicidal behaviors, the causes may vary across communities (24). Regarding urban China, it is tempting to consider that the one-child policy may be contributory. Thus, some researchers have found that two and a half decades of this policy has given rise to young people marked by increased interpersonal dependency, neuroticism, and hence negative mental health outcomes (12). Such a conclusion may be supported by a study of the inter-cohort variation in DSM-IV mental disorders in the same metropolitan survey where data for the present survey were obtained. This revealed that the relative odds of any lifetime disorder were 4.7 in the most recent cohort (ages 18–34) compared with the eldest cohort (ages ≥65) (15). However, it is possible that young people may merely be more ready than older ones to disclose both suicidal behaviors and the core symptoms of mental disorders following increasing societal acceptance of discussing psychological problems in China.

Findings in cross-national context

Cross-national studies of the prevalence of suicide ideation and attempts in the general population have revealed a wide range of rates that can be explained by methodological and/or substantive factors (1, 25–27). The prevalence of suicidal behaviors in this study is in the low end of the range of estimates reported (28). There are several possible interpretations of the low prevalence we found. First, it may be argued that people in urban China have good mental health following the economic prosperity they have enjoyed relative to their rural counterparts. Indeed, the average suicide rate for urban areas in Beijing for the period 1987–1996 was only 6.0/100 000 (3), and the rate for urban China in general decreased from 8.7/100 000 to 6.0/100 000 during 1991–2000 (8). Second, popular methods of attempting suicide (e.g. pesticides) are more lethal in China than elsewhere, so that even a low prevalence of suicidal behaviors would result in a globally average rate of completed suicide. However, as the most common method of attempting suicide in urban China is overdose with tranquillizers rather than pesticides (as in rural China), this explanation seems implausible. Third, mental disorders such as depression are uncommon in China, so that suicidal behaviors are less likely to arise. Fourth, there has been no solid evidence that self-reported prevalence estimates of suicidal behaviors are necessarily correlated with rates of completed suicide. This may be because both types of data are subject to sources of bias that may vary across communities (26, 27). A final and in our view likely explanation is a systematic downward bias toward reporting suicidal behaviors (and mental disorders generally) during face-to-face household interviews in China (16). This is not surprising because suicide is still surrounded by layers of shame, stigma, and secrecy among Chinese people. Neither suicide nor mental disorders are generally perceived to be a public health problem that should be studied during a psychiatric household survey (13).

Prevalence estimates apart, our findings are consistent with the cross-national literature (9, 13, 26–30). First, female sex, young age, low education, and being unmarried are risk factors for suicidal behaviors. As some but not all research suggests, there is no significant association between employment and suicidal behaviors. Second, the risk of suicide attempt is the highest in the first year of onset of ideation and plan and having a plan increases the risk of a subsequent attempt. Third, mood disorder is the strongest predictor for suicidal behaviors, followed by generalized anxiety disorder, and intermittent explosive disorder. It is also notable that while mood and anxiety disorders are consistently associated with each suicidal behavior, impulse-control and substance use disorders are most strongly associated with suicide attempts. This latter is especially so for unplanned or impulsive attempts, which commonly occur among Chinese suicidal attempters (10). Moreover, there is a dose–response relationship between the number of mental disorders and suicidal behaviors (30), supporting a dimensional approach to evaluate psychopathology in suicide research (10).

Limitations

The present study provides new findings on the prevalence, onset distributions and transitional patterns of suicidal behaviors in urban China. These findings should be interpreted in the context of the following limitations. First, China consists of about 75% of rural areas which exhibit a different pattern of suicide from urban areas (7, 14). Consequently, our findings may at best be generalized to a quarter of the Chinese population. Second, suicidal behaviors were assessed by retrospective self-report without independent validation. Although systematic reviews have shown that adults can recall past experiences

with sufficient accuracy (31), recall bias arising from different sources could certainly arise from forgetfulness, stigma or other unknown sources. Nonetheless, as our part I interview asked about mental disorders such as major depression, this might facilitate mood-congruent recall of suicidal ideation in the part II interview. Moreover, we used response booklet in an attempt to reduce respondent reluctance to reveal suicidal idea or behaviors that could affect the internal validity of response over time. Third, suicidal ideation could be momentary, chronic, recurrent and interact with plan and attempts, so could the plans and attempts. This study has not investigated the complexity of recurrent thought, plan, and attempts in more detail. Fourth, owing to the low prevalence of mental disorders, certain subtypes of disorders (e.g. social phobia) were excluded from statistical analysis. Fifth, psychotic disorders were not assessed even though they constitute the focus of mental health policy in China. Finally, dimensional measures of psychopathology, personality disorders, strength of suicidal ideation, methods and repetitiousness of suicide attempt, and non-suicidal self-injurious behaviors were not considered.

Implications

Our findings have implications for both suicide research and public health. Given the vast heterogeneity within China today, they call for further examination of the local determinants of the variability in suicidal behaviors using more complex models of risk and protective factors such as socially shaped changes in gender role (29) in both urban and rural areas of China (11).

Previous studies indicated that only 0.25% of suicide attempters attended hospital emergency departments in urban China (9). Likewise, 91% of those with completed suicide never visited a mental health professional (10). In all likelihood, individuals who reported suicide attempts in the present study barely received medical treatment, not to speak of those with ideation or plan. This treatment gap also applies to people with mental disorders, whether they are suicidal or not, in urban China. Thus, a recent study shows that only 7.9% of people with mood disorders will ever make treatment contact in Beijing and Shanghai (32). The situation of rural China could be worse. Given the huge size of the Chinese population and the unfavorable long-term outcome of suicide attempters (33), the need for multi-level policy and programs, and the political will that must accompany them, can hardly be overemphasized.

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