

# BMJ Open Effects of life satisfaction and psychache on risk for suicidal behaviour: a cross-sectional study based on data from Chinese undergraduates

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## ABSTRACT

**Objectives:** To examine predictive power of psychache and life satisfaction on risks for suicidal ideation and suicide attempt among young people.

**Design:** A cross-sectional study.

**Setting:** Data were collected from an online survey in Wuhan, China.

**Participants:** 5988 university students from six universities were selected by a stratified cluster sampling method.

### Primary and secondary outcome measures:

Suicidal ideation and suicide attempt at some point of the students' lifetime were the outcomes of interest.

**Results:** Students with suicidal ideation or attempted suicide reported a lower level of life satisfaction and high degree of psychache than counterparts without suicidal ideation or attempt. Regression analyses indicated that life satisfaction and psychache were significantly associated with the risk of suicidal ideation and the risk of suicidal attempt. Though psychache showed a relatively stronger predictive power than life satisfaction, the effect of the two factors remained significant when they were individually adjusted for personal demographic characteristics. However, when the two factors were included in the model simultaneously to adjust for each other, psychache could fully explain the association between life satisfaction and suicidal attempt. Life satisfaction remained to contribute unique variance in the statistical prediction of suicidal ideation.

**Conclusions:** Psychache and life satisfaction both have a significant predictive power on risk for suicidal behaviour, and life satisfaction could relieve the predictive power of psychache when suicidal behaviour is just starting. Shneidman's theory that psychache is the pre-eminent psychological cause of suicide is perhaps applicable only to a more serious form of suicidal behaviour.

## INTRODUCTION

Suicidal behaviour in young people has become an increasing social and public health problem in contemporary China as

## Strengths and limitations of this study

- It is a cross-sectional study.
- Study participants comprise a large sample of students randomly selected from six universities in a city of central China, but it is uncertain if they could represent all university students in China.
- Self-reported suicide attempts may have limited validity or reliability.

well as in many other parts of the world.<sup>1–3</sup> With around 287 000 casualties in the total population of China each year,<sup>4</sup> suicide is the leading cause of death in young people aged 15–34 years and the mortality among Chinese aged 15–24 years stands in the second highest place among the 39 countries that provided the data on suicide to the WHO.<sup>5</sup> Suicide in China is known for its high OR of the rates in rural versus urban areas, and in women versus men particularly in young age groups,<sup>6, 7</sup> but the problem in other forms as suicidal ideation and suicide attempt in Chinese youth is generally less known and warrants thorough investigation.

Suicidal behaviour is a complicated phenomenon. It is associated with social and environmental factors and particularly with a variety of traits and disadvantages on a personal level. A great number of studies have demonstrated significant relationships of suicide with personal sociodemographics,<sup>8</sup> life stressors,<sup>9</sup> biological features,<sup>10</sup> psychological traits,<sup>11</sup> psychiatric problems,<sup>12</sup> coping skills,<sup>13</sup> etc. Psychological pain is thought to be of great importance, playing an indispensable role in the process of becoming suicidal.<sup>14, 15</sup>

Psychache, according to Shneidman,<sup>16, 17</sup> is defined as an acute state of intense and intolerable psychological pain that encompasses shame, guilt, humiliation, loneliness, fear, angst, dread, anguish, etc. It is associated with many psychological suicidogenic

factors such as depression and hopelessness, but is also conceptually distinct from these factors.<sup>18 19</sup> Evidence has shown that psychache is a significant and unique predictor for various suicide criteria, including suicidal ideation and suicide attempt, even after being controlled for effects of depression and hopelessness.<sup>18 20 21</sup> According to Shneidman,<sup>16 17</sup> psychache is fundamentally linked with suicide on its own, whereas other psychological factors and affective states (eg, depression, hopelessness, etc) are relevant to suicide only insofar as they lead to psychache. In other words, if psychache is controlled, the single effect of many factors would be largely attenuated or become insignificant.<sup>22</sup> Thus, psychache is the switch deciding whether a suicide happens or not. In concrete terms, if psychache is too much to tolerate for a person, the person will think dying is the best solution. As a way of relief from the intolerable psychache the individual may choose a lethal method of suicide. In contrast, if psychache could be relieved or mollified, the choice of a lethal method of suicide would be reduced, thus extending their lives.<sup>24</sup>

It is suggested that completion of suicide is a balanced consequence, depending on the presence of risk factors and the absence of protective factors against suicide.<sup>25</sup> However, most of the available studies about the pre-eminence of psychache in suicidality have only involved negative psychological variables, such as hopelessness,<sup>18</sup> depression<sup>21</sup> and alexithymia.<sup>26</sup> Little research attention has delved into positive factors, such as life satisfaction—a measure that is reported to be strongly and negatively correlated with suicidal ideation and suicide attempt<sup>27 28</sup> and to have a long-term effect on the risk of suicidal behaviour.<sup>29</sup> At the same time, suicide studies testing Shneidman's model have been predominantly from North America; to the best of our knowledge, there is a sparsity of studies that have tested Shneidman's theory with a large sample from another culture. To better understand the role of psychache in the mechanism of suicidality, we believe that studies that take into account effects of positive factors, such as life satisfaction, and that use data from diverse cultural backgrounds would provide interesting insights.

We therefore conducted the present study with the primary purpose of testing Shneidman's theory of suicide by assessing the predictive power of life satisfaction and psychache on risk for suicidal behaviour in a large sample of Chinese college students. Our specific aims are: (1) to examine the prevalence of suicidal ideation and suicide attempt among Chinese college students, (2) to assess the predictive power of life satisfaction and psychache on risk for suicidal behaviour and (3) to explore the role of psychache in the mechanism of suicidality.

## METHOD

### Participants

Of eight universities that are attached directly to the ministries of the People's Republic of China and located

in the city of Wuhan, six universities agreed to join the survey for this study. A stratified cluster sampling method was used to draw study subjects from all undergraduate students in these universities. A 10% sample of undergraduate students was assigned to each university, and then randomly selected in classes—the cluster unite that is organised according to specialty and school year with usually 30–80 students. In case a selected class has more than 100 students, 100 students were drawn randomly from this class. Otherwise, all students in the drawn classes were enrolled into the study. The rationale of restricting samples from a large class to up to 100 students is to reduce the likelihood of overweight of large classes and thus to ensure a better representativeness of the 10% sampled students in each university. Consequently, we drew a 10% sample students from all six universities, consisted of 93 cluster units (classes). Of 21 large classes (22.58%), 100 students were further sampled.

With this sampling procedure, a total of 7220 college students were sampled and 6096 students finally attended the questionnaire survey for the data collection, corresponding to a response rate of 84.44%. Most students who did not attend the survey were out of the university campus for their internship during the period when the survey was conducted.

The survey was conducted online. Each selected student was assigned with an encrypted code unique to their student identification to be used as a personal password for online access to the website designed for the survey. Students enrolled into the survey were informed about the purpose of the study, the confidentiality of personal information and the principle of voluntariness. Of 6096 students who attended the online survey, 5988 completed all question items designed for this study and were therefore included in the final dataset for analyses.

### Measurements

For each participant, we collected data on personal general information and demographic status such as gender, age, place of family residence, school year and specialty of study alongside data on life satisfaction, psychache and suicidal behaviour as described below.

#### Life satisfaction

Life satisfaction was assessed with the Satisfaction with Life Scale,<sup>30</sup> which is a self-report questionnaire comprising five items, that is, (1) 'In most ways my life is close to my ideal'; (2) 'My life condition is very good'; (3) 'I am satisfied with my life', (4) 'I have got the important things which I want in the life' and (5) 'If I had new life, I would enjoy it just as I do now'. All items are answered on a seven-point Likert scale (1, strongly disagree; 2, disagree; 3, incomplete disagree; 4, not sure; 5, incomplete agree; 6, agree and 7, strongly agree). The average score of the five items was calculated as the score of life satisfaction (scores range 1–7). The Satisfaction with Life Scale has been reported with high

$\alpha$  reliability coefficients; 0.89 in one study<sup>31</sup> and 0.86<sup>32</sup> in another. In the present study, the  $\alpha$  reliability coefficient was 0.85.

### Psychache

Psychache was measured with the Psychache Scale, which is a 13-item (eg, My soul aches) self-report questionnaire designed to assess Shneidman's conceptualisation of psychache.<sup>22</sup> All items are answered on a five-point Likert scale and the total scores range from 13 to 65 (high score indicates a high psychache level). In order to precisely capture the level of psychache, we constructed a continuous variable to categorise the score into five levels defined after taking into account the frequency distribution and score value as 1=13–15, 2=16–19, 3=20–22, 4=23–26 and 5=27–65. The  $\alpha$  reliability coefficients of this scale were generally exceeding 0.90,<sup>22 33</sup> and the scale could distinguish between suicide attempters and non-attempters.<sup>22</sup> In the present study, the  $\alpha$  reliability coefficient was 0.92.

### Suicidal ideation and suicide attempt

Suicidal ideation was defined as thoughts or wishes to be dead or to kill oneself according to Schneidman and Silverman *et al.*<sup>14 34 35</sup> It was assessed through the following two question items: (1) 'have you seriously considered about killing yourself in the past 1 year', and (2) 'have you ever seriously considered about killing yourself in your life'. These two items were answered on a three-point Likert rating (0, never; 1, sometimes and 2, very often). Participants who answered with '0' for both items were regarded as 'without suicidal ideation', whereas all others were regarded as 'with suicidal ideation'.

Suicide attempt was defined as a self-inflicted behaviour with a non-fatal outcome for which there is evidence of intent to die.<sup>34</sup> It was assessed with three questions: (1) 'have you ever tried or attempted to kill yourself in the past year', (2) 'have you ever tried or attempted to kill yourself in your life' and (3) 'have you ever taken any non-fatal suicidal action'. The first two items were answered on a three-point Likert rating (0, never; 1, sometimes and 2, very often) and the third item had a binary answer of 'yes' or 'no'. Participants who answered with '0' for the first two items and 'no' for the third item were regarded as 'without suicide attempt', and otherwise regarded as 'with suicide attempt'.

### Statistical analysis

$\chi^2$  Test was used to examine the distribution difference of suicidal behaviour (suicidal ideation and suicidal attempt) by demographic variables. T test was conducted to test the variation of scores on life satisfaction and psychache according to the presence of suicidal behaviour. Logistic regression was used to assess the predictive power of psychache and life satisfaction on risk of suicidal behaviour and also to evaluate the relative

importance of these two factors via three models. Model I estimated the crude effect of each variable of interest; model II estimated the individual effect of life satisfaction and of psychache in the adjustment of demographic variables and model III adjusted the effect when all variables were included in the model.

## RESULTS

### General description

The total sample of 5988 students comprised 3203 male and 2785 female students, with the age ranging from 14 to 26 years (mean=19.94; SD=1.38). **Table 1** shows the demographic distribution of the study participants in details.

Of the total students, 16.4% (982) participants reported the presence of suicidal ideation and 1.9% (114) reported a history of suicide attempt at some point of their lifetime. The prevalence differed significantly with regard to most demographic variables as shown in **table 2**. Suicidal ideation was more prevalent in female than male students (20.4% vs 12.9%), in students coming from large cities as provincial capitals or direct-controlled municipalities (18.9%), and in students studying liberal arts (20.8%), in freshman students (17.8%), and consistent with this, in students in relatively younger age groups. These observed patterns remained very similar when looking at the self-reported presence of suicide attempt, although the differences by most demographic factors did not reach a statistical significance. Still, it is evident that female students reported a significantly higher rate of suicide attempt (2.6%) than their male counterparts studying in the universities (2.6% vs 1.3%).

### Distribution of life satisfaction and psychache according to presence of suicidal behaviour

**Figure 1** shows the frequency distribution of students according to the level of life satisfaction and the raw score of psychache. For life satisfaction, the scores exhibited a normal distribution, ranging from 1 to 7. However, the scores of psychache exhibited a partial normal distribution with the majority having a low score and a few at the high end. According to Shneidman's theory, psychache is an intense and intolerable extreme state involving heavy psychological pain. It is therefore reasonable that most of the people experienced a mild psychological pain while intense psychological pain was present in the minority.

**Table 3** presents the means and SDs of the scores on life satisfaction and psychache according to the presence of suicidal ideation and suicide attempt. The results from t tests indicate that students with suicidal ideation or suicide attempt reported a significantly lower score of life satisfaction and a significantly higher score of psychache. This, in other words, means that a high level of life satisfaction and low degree of psychache are protective against suicidal behaviour within this population.

**Table 1** Demographic distribution of students in the study

Demographic variables	Number (%)		
	Total	Male	Female
Residence place of family			
Provincial capital or direct-controlled municipality	924 (15.4)	413 (44.7)	511 (55.3)
County-level city	1353 (22.6)	665 (49.2)	688 (50.8)
County	803 (13.4)	417 (51.9)	386 (48.1)
Township	861 (14.4)	465 (54.0)	396 (46.0)
Suburban countryside	930 (15.5)	510 (54.8)	420 (45.2)
Remote countryside	1114 (18.6)	733 (65.8)	381 (34.2)
Specialty of study			
Engineering	2036 (34.0)	1568 (77.0)	468 (23.0)
Science	2310 (38.6)	1107 (47.9)	1203 (52.1)
Liberal arts	1642 (27.4)	528 (32.2)	1114 (67.8)
Grade			
Freshman	2770 (46.3)	1351 (48.8)	1419 (51.2)
Sophomore	1748 (29.2)	1025 (58.6)	723 (41.4)
Junior	1134 (18.9)	589 (51.9)	545 (48.1)
Senior	336 (5.6)	238 (70.8)	98 (29.2)
Age, (years)			
14–18	828 (13.8)	352 (42.5)	476 (57.5)
19–21	4390 (73.3)	2349 (53.5)	2041 (46.5)
22–26	770 (12.9)	502 (65.2)	268 (34.8)

In the study population, three students did not report the region of permanent family residence.

### Effect of life satisfaction and psychache on risk for suicidal ideation and suicide attempt

Table 4 displays the results from modelling the data with logistic regression in order to assess the statistical predictive power of psychache and life satisfaction on risk for suicidal ideation and suicide attempt.

The results from model I and model II both indicated that life satisfaction and psychache had a significant power in predicting suicidal ideation and suicide attempt, and that a higher level of life satisfaction was associated with a reduced risk while a higher level of psychache was associated with an increased risk for suicidal ideation and for suicide attempt. In model III, psychache continued to have a significant effect on the risk for suicidal ideation and suicide attempt. The effect of life satisfaction, however, differed somehow in model III; its predictive power remained highly significant for the risk of suicidal ideation but attenuated into insignificant for suicide attempt. This means that when the effects of demographic variables and psychache were controlled, life satisfaction did not have a significant predictive effect on suicide attempt; it was relevant to suicide attempt only insofar as it led to psychache.

## DISCUSSION

In this study, we have investigated the role of life satisfaction and psychache on suicidal ideation and suicide attempt among university students in China using a large random sample from six universities. It is, to our awareness, the first study to examine Schneidman's theory on psychache and suicidology in a Chinese

culture, and also the first to assess the role of psychache on suicidality in the context of the positive psychological factor of life satisfaction.

### Differences in suicidal ideation and attempt by gender, grade and specialty

The present study demonstrates that suicidal ideation and suicide attempt were more prevalent in female students than in male students. This mostly aligns with previous studies from China and many other places reporting a higher prevalence of suicidal behaviours in young females than young male students.<sup>36–39</sup> One explanation for the higher female versus male suicidal behaviour in our study population perhaps lies in the Chinese culture, especially the deep-rooted Confucianism produced in a patriarchy which tended to denigrate women.<sup>39–40</sup> On the other hand, since the observed phenomenon exists worldwide regardless of culture, we believe that the gender-specific personality traits may, to a large extent, contribute to our observation.<sup>36–39</sup>

Our finding that students studying liberal arts reported a significantly higher occurrence of suicidal ideation and also modestly higher suicide attempt than their peers studying Engineering and Science is interesting. Of course, the fact that relatively more female students choose to study liberal arts than other subjects may contribute to the result. It may also reflect a selection of personality traits that liberal arts students may react more sensitively and emotionally to events and stressors than their counterpart students studying other subjects.



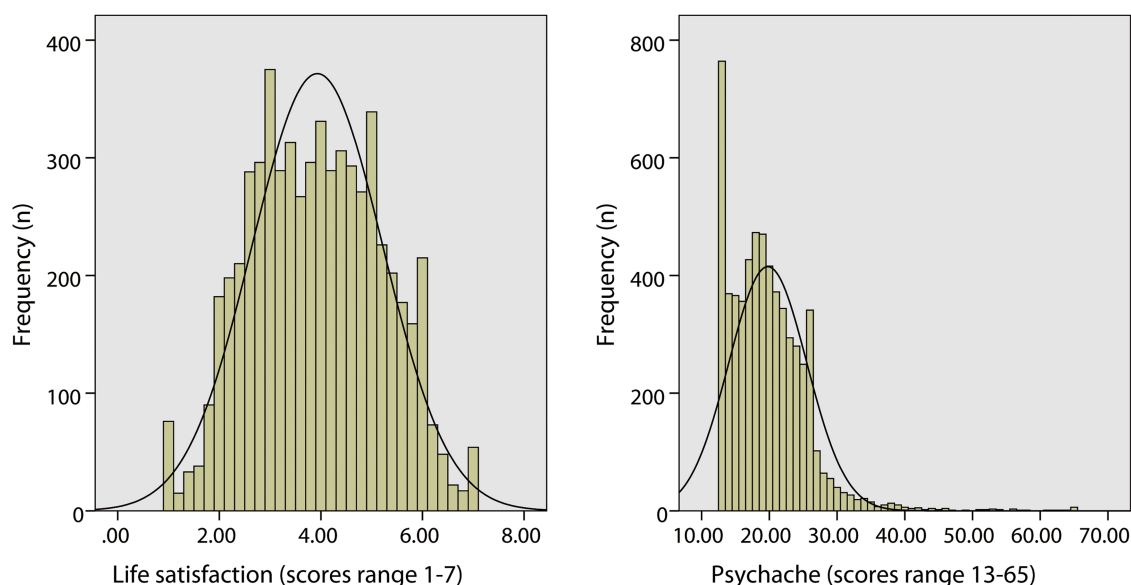
**Table 2** Prevalence of suicidal ideation and suicide attempt by demographic variables

	Number N	Suicidal ideation N (%)	Test of difference	Suicidal attempt N (%)	Test of difference
Total	5988	982 (16.4)		114 (1.9)	
Gender			$\chi^2=60.63$ df=1		$\chi^2=12.95$ df=1
Male	3203	414 (12.9)		42 (1.3)	
Female	2785	568 (20.4)	p=0.0000	72 (2.6)	p=0.0002
Residence place of family			$\chi^2=6.26$ df=5		$\chi^2=8.92$ df=5
Provincial capital or direct-controlled municipality	924	175 (18.9)	p=0.2819	26 (2.8)	p=0.1123
County-level city	1353	218 (16.1)		27 (2.0)	
County	803	124 (15.4)		19 (2.4)	
Township	861	129 (15.0)		15 (1.7)	
Suburban countryside	930	151 (16.2)		12 (1.3)	
Remote countryside	1114	184 (16.5)		15 (1.3)	
Specialty of study			$\chi^2=33.16$ df=2		$\chi^2=4.51$ df=2, p=0.105
Engineering	2036	289 (14.2)		30 (1.5)	
Science	2310	351 (15.2)	p=0.0000	44 (1.9)	
Liberal arts	1642	342 (20.8)		40 (2.4)	
School year			$\chi^2=21.22$ df=3		$\chi^2=5.61$ df=3
Freshman	2770	493 (17.8)		58 (2.1)	
Sophomore	1748	270 (15.4)	p=0.0001	31 (1.8)	p=0.1322
Junior	1134	191 (16.8)		24 (2.1)	
Senior	336	28 (8.3)		1 (0.3)	
Age, (years)			$\chi^2=8.56$ df=2		$\chi^2=3.79$ df=2
14–18	828	150 (18.1)		15 (1.8)	
19–21	4390	732 (16.7)	p=0.0138	91 (2.1)	p=0.1500
22–26	770	100 (13.0)		8 (1.0)	

In the study population, three students did not report the region of permanent family residence.

In addition, we note that students in the early school years or at a younger age reported more suicidal ideation than their higher grade or elder peers. These results are somehow as expected and could well be explained by the hardship to adapt to the college life

and limited experience in handling stressors at the beginning of college life. With the increase of age and experience, the students become better in coping with and handling stressors that they would not be able to handle at younger ages.

**Figure 1** Distribution of life satisfaction and psychache scores in the study participants.

**Table 3** Scores of life satisfaction and psychache by presence of suicidal ideation and suicide attempt

	Number of participants	Mean (SD)	
		Life satisfaction	Psychache
Total		3.93 (1.29)	1.56 (1.27)
Suicidal ideation			
Yes	982	3.50 (1.22)	2.44 (1.21)
No	5006	4.02 (1.28)	1.39 (1.20)
T test		-11.97	24.95
Df		5986	5986
p Value		0.0000	0.0000
Suicide attempt			
Yes	114	3.48 (1.44)	2.55 (1.36)
No	5874	3.94 (1.28)	1.54 (1.26)
T test		-3.81	8.49
Df		5986	5986
p Value		0.0001	0.0000

Life satisfaction score ranges from 1 to 7; psychache score ranges from 1 to 5.

### Psychache, life satisfaction and suicidal behaviour

The present study indicates that psychache and life satisfaction were both significant predictors for suicidal ideation and suicide attempt in the study population. Psychache had stronger power in predicting suicidal ideation and suicide attempt than life satisfaction, as evidenced by its larger standardised regression coefficients. This result is in line with the finding from other studies testing Shneidman's theory with samples of general population<sup>41</sup> and special groups as offenders,<sup>33 42</sup> homeless people<sup>20</sup> and patients with mental illness.<sup>43</sup> The result supports Shneidman's view that psychache is a fundamentally important predictor for suicidal behaviour.

Moreover, our analyses further indicate that the mediating role of psychache on the occurrence of suicidal behaviour differed slightly between suicidal ideation and suicide attempt. In the prediction of suicide attempt, psychache accounted for a greater proportion of variance than did life satisfaction. The association between life satisfaction and suicidal attempt were completely residualised by psychache, as Shneidman had predicted. Life satisfaction was relevant to suicide attempt only when it was associated with psychache. However, for suicidal ideation, life satisfaction, independent of psychache, continued to have an additional significant contribution. In other words, psychache was not inevitable to suicidal ideation and played a partial role mediating the link between life satisfaction and suicidal ideation. This observation is in line with findings in a number of published studies. For instance, a large scale study of college students showed that psychache did not fully mediate the association between suicidal ideation and hopelessness; the change in hopelessness during the follow-up period remained a significant predictor.<sup>44</sup> One possible explanation to this result is that psychache may be associated with more serious forms of suicidal

**Table 4** Predictive power of life satisfaction and psychache on risk of suicidal ideation and of suicide attempt

Variables of study	Model I				Model II				Model III			
	B	Wald	p Value	OR 95% CI	B	Wald	p Value	OR 95% CI	B	Wald	p Value	OR 95% CI
Suicidal ideation												
Gender	-0.55	59.75	0.0000	0.58 0.51 to 0.67	-0.64	71.53	0.0000	0.53 0.45 to 0.61	-0.64	71.53	0.0000	0.53 0.45 to 0.61
Grade	-0.13	11.04	0.0009	0.88 0.81 to 0.95	0.04	0.69	0.4049	0.96 0.87 to 1.06	0.04	0.69	0.4049	0.96 0.87 to 1.06
Ages	-0.19	7.48	0.0062	0.83 0.73 to 0.95	-0.07	0.78	0.3785	0.93 0.79 to 1.10	-0.07	0.78	0.3785	0.93 0.79 to 1.10
Life satisfaction	-0.32	127.81	0.0000	0.73 0.69 to 0.77	-0.36	151.82	0.0000	0.70 0.66 to 0.74	-0.15	19.89	0.0000	0.81 0.81 to 0.92
Psychache	0.67	497.41	0.0000	1.96 1.85 to 2.08	-0.68	498.28	0.0000	1.98 1.86 to 2.10	0.63	379.54	0.0000	1.76 1.76 to 2.00
Suicide attempt												
Gender	-0.69	12.47	0.0004	0.50 0.34 to 0.74	-0.73	13.18	0.0003	0.48 0.33 to 0.72	-0.73	13.18	0.0003	0.48 0.33 to 0.72
Grade	-0.15	1.95	0.1626	0.86 0.70 to 1.06	-0.06	0.25	0.6164	0.94 0.73 to 1.20	-0.06	0.25	0.6164	0.94 0.73 to 1.20
Ages	-0.20	1.17	0.2802	0.82 0.57 to 1.17	-0.04	0.04	0.5810	0.96 0.63 to 1.46	-0.04	0.04	0.5810	0.96 0.63 to 1.46
Life satisfaction	-0.29	14.27	0.0002	0.75 0.65 to 0.87	-0.33	17.85	0.0000	0.72 0.62 to 0.84	-0.11	1.56	0.2123	0.90 0.76 to 1.06
Psychache	0.62	63.12	0.0000	1.86 1.60 to 2.17	0.62	62.90	0.0000	1.87 1.60 to 2.18	0.58	47.10	0.0000	1.79 1.52 to 2.11

Value of variables: gender 0 (female)—1 (male); grade 1—4; age group 1 (14–18 years old)—3 (22–16 years old); life satisfaction score 1–7; psychache score 1–5. Model I: crude analyses without any adjustment; model II: only adjusted for gender, grade and age; model III: adjusted for all variables listed in the table.

behaviour. Suicide is known as a continuous process with suicide attempt being a more severe form than suicidal ideation.<sup>16</sup> Many factors influence suicidal attempt only insofar as they are related to psychache, so psychache is the inevitable channel to suicidal attempt. A study conducted by Mendonca and Holden<sup>45</sup> on population-based psychiatric inpatients also demonstrated that psychache exhibited a stronger influence in persons who had actually formulated a plan for suicide than those who had general suicidal desires. That is to say that psychache represents a more distal vulnerability in a chain culminating in suicidality.

In addition, our results show that psychache is independently and positively associated with suicidal ideation and suicide attempt, and that the ORs associated with psychache were eliminated when adjusted for effects of life satisfaction and demographic variables simultaneously. These results suggest that life satisfaction may be opposed and relieve psychache, and thus verify Shneidman's<sup>16</sup> theory that if the psychache surpasses the threshold of tolerance and is subjectively judged to be unbearable, intolerable or unacceptable, the individuals would then die from suicide in order to escape from the suffering. However, if psychache is relieved, for example, via effect of protective factors such as life satisfaction, then the originally unbearable psychological pain become acceptable and the individual would stay to live on.<sup>24</sup>

From a clinical point of view, the phenomenology of suicide refers to the inner world of individuals and focuses on what the individual feels as well as understanding from the inside whenever a clinician encounters a patient.<sup>46</sup> Shneidman<sup>17 24</sup> considers psychache to be the main ingredient of suicide, and regards suicide not as a movement towards death but rather as a remedy to escape from intolerable emotion, unendurable or unacceptable anguish. Suicidal individuals experience dichotomous thinking, wishing for either some specific (almost magical) total solution for their psychache or cessation (suicide), and suicide is the result of an interior dialogue during which the mind scans its options.<sup>23</sup> The present study indicates that life satisfaction may relieve the psychache and therefore reduces the risk for suicidal ideation and suicide attempt. Treatment for psychache, for example, using anodyne psychotherapy<sup>47</sup> to mollify unbearable psychological pain, may well have an effect on reducing the risk for suicidal behaviour.

### Limitations of the study

There are several limitations of the present study. First, like most research in this area, the present study is a cross-sectional investigation. This makes it impossible to document any causal relationship of life satisfaction and psychache with suicidal ideation or suicide attempt. While the present study is supportive of Shneidman's view concerning the pre-eminent role of psychache on suicidal behaviour, further studies with a cohort design are needed to verify the possible causal pathways.

Second, self-reported suicide attempts have limited validity or reliability due to recall bias;<sup>35</sup> we are unable to verify if the reported suicide attempt truly happened in the students' real life. Another concern is related to the generalisability of the findings from the present study. The study students were sampled strictly by a stratified cluster sampling method and from six universities in a major city in Central China. Yet we are confident that these students could well represent all undergraduate college students in the area of Central China; we are uncertain whether they are representative of undergraduates studying in other places of China such as the more developed coasts and the less developed western China. This calls for more research to test the model using samples from other parts of China as well from areas with different cultures. Moreover, to our awareness, no protective variable such as life satisfaction has been encompassed in Shneidman's model so far. Some postulates, for example, that life satisfaction could relieve psychache and thus prevent suicide, need to be further verified by studies from various social settings.

### Conclusions

The present study sought to test Shneidman's theory of suicide as psychache using a large sample of university students in China, and to extend existing research by including the protective variable of life satisfaction. The results indicate that psychache and life satisfaction both contribute to the risk for suicidal ideation and suicide attempt, and that psychache plays a mediating role on the link between life satisfaction and suicidal behaviour. More specifically, psychache could fully mediate the relationship of life satisfaction with suicidal attempt, but acts as a partial mediator linking life satisfaction with suicidal ideation, suggesting that Shneidman's theory is probably more applicable to severe forms of suicidality.

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