

Poor emotional status increases the risk of attempted suicide for the elderly age 55 and older in Shanghai, China: A longitudinal follow-up study

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SUMMARY We conducted a study to explore how one's emotional state affects attempted suicide among the elderly in Shanghai, China. Random sampling was used to select people age 55 and older in Shanghai from 2013 to 2019. A questionnaire was used to collect relevant data, including attempted suicide and emotional status. Subjects were a total of 783 elderly people who participated in this study for two years and more, and they consisted of 569 elderly people did not commit suicide during the study period and 214 elderly people who attempted suicide. Cumulative logistic regression indicated that feeling less interested than usual in hobbies ($p < 0.001$, OR = 2.805, 95% CI: 0.941-8.360) and being more easily angered ($p < 0.0001$, OR = 11.972, 95% CI: 6.275-22.843) increase the risk of attempted suicide.

Keywords attempt suicide, risk factors, people age 55 and older, Shanghai

To the Editor,

Suicide has become a growing global public health concern. According to a report published by World Health Organization (WHO) in 2019, 703,000 people die by suicide every year, which is one person every 40 seconds (1). A prior suicide attempt is the single most significant risk factor for suicide in the general population. Based on data updated in July, 2021 the crude suicide rate for people age 65 and older is 129.42 per 100,000 population, three times that of the population under 64 years of age (2). About 25-30% of individuals who attempt suicide will continue to do so, and 22-44% will eventually die of suicide (3). Moreover, a 37-year longitudinal study has indicated that the risk of death due to attempted suicide remains over one's lifetime (4). Therefore, the study of attempted suicide and factors influencing it is significant to suicide prevention.

The characteristics of attempted suicide can help to explain the high suicide rate and unique characteristics of suicide (5). Attempted suicide is the stage of further behaviors after an individual's suicidal ideation but before successfully committing suicide (6). Therefore, identifying the risk factors for attempted suicides and preventing them among the elderly is significant. Research has indicated that the average annual suicide rate for urban elderly has increased significantly in the 21st century (7). The current study was conducted in

Shanghai, a typical urban area in China where over 35% of the population is elderly (60 years and older) (8). This study sought to explore the impact of emotional status on suicidal behavior by the elderly in Shanghai, China.

Study design This study obtained survey data from the Shanghai Unified Needs Assessment for Elderly Care. This study was a long-term survey organized by the Shanghai Health Development Research Center from March 2013 to October 2019. The Ethics Committee of the Shanghai Medical and Technology Information Institute approved this study (no. 2022009). Potential subjects age 55 and older were eligible for inclusion in this study if they participated in the survey for two years and more. As a result, there were 783 elderly subjects. All investigators receive standardized training. Subjects were then interviewed face to face after giving written informed consent.

The primary outcome measures in this study were subjects' suicidal behavior and emotional condition. *i)* The question to examine suicidal behavior was "How many times have you tried to commit suicide in the past 14 days?". Answers were collected in the form of "none", "once", "two or three times", "four to seven times", and "eight times or more". *ii)* Three questions were included in the section on emotional condition. The first question was "What do you think of your physical health over the last week?", and the options were: "excellent", "good",

Table 1. Risk factors associated with attempted suicide among elderly adults

| Variables | Estimate | Standard Error | Wald Chi-square | Pr> ChiSq | OR | 95% Wald Confidence Limits |
|------------------------------|----------|----------------|-----------------|-----------|--------|----------------------------|
| Self-reported health status | | | | | 1.000 | |
| Same | | | | | | |
| Worse | 2.404 | 0.413 | 33.970 | < 0.0001 | 13.756 | 3.964-47.738 |
| Level of interest in hobbies | | | | | | |
| Same | | | | | | |
| Lower | 1.310 | 0.351 | 13.927 | 0.000 | 2.805 | 0.941-8.360 |
| More easily angered | | | | | 1.000 | |
| Same | | | | | | |
| Worse | 1.122 | 0.237 | 22.342 | < 0.0001 | 11.972 | 6.275-22.843 |

"fair", "poor", and "very poor". The five possible answers to the question "How often do you spend engaged in your usual hobbies?" were "no or little time", "about once a month", "about once a week", "about once a day", and "multiple times a day". Similarly, the five possible answers to the question "Are you more easily angered than usual?" were "no or little time", "about once a month", "about once a week", "about once a day", and "multiple times a day".

Characteristics of study subjects A total of 783 subjects were divided into two groups depending on whether they had attempted suicide. The elderly who had not attempted suicide were designated the group who had not attempted suicide, and those who reported having attempted suicide one or more times were designated the group who had attempted suicide. Five hundred and sixty-nine subjects had not attempted suicide, but 214 subjects had attempted suicide during the study.

As mentioned, 214 subjects had not previously attempted suicide but attempted suicide during the study. Of these, 58 (27.10%) reported that their health had deteriorated, 63 (29.44%) reported that their health remained the same, and 93 (43.46%) reported that their health improved. Of the 214 subjects, 57 (26.64%) mentioned being less interested in their previous hobbies, 66 (30.84%) mentioned remaining interested in their previous hobbies, and 91 (42.52%) mentioned being more interested in their previous hobbies. Of the 214 subjects, 126 (58.88%) were more easily angered than usual, 47 (21.96%) remained the same, and 41 (19.16%) were less easily angered than usual.

Feeling less interested in previous hobbies was a risk factor associated with attempted suicide in the elderly Results of cumulative logistic regression analysis suggested that feeling less interested in previous hobbies ($p < 0.001$, OR = 2.805, 95% CI: 0.941-8.360) increased the risk of attempted suicide, indicating that elderly who have lost interest in hobbies are 2.805 times likelier to attempt suicide than elderly who remained interested. Results are shown in Table 1. A previous study noted a relationship between low positive affect and suicidal ideation (9) in the form of anhedonia. Anhedonia is one of the core symptoms of depression and represents a reduction in positive emotions such

as joy, enthusiasm, self-confidence, and interest. The previous study found that anhedonia is potentially associated with suicidal ideation, and this is similar to the current findings.

Being more easily angered was another risk factor that increases suicide attempts in the elderly Results of cumulative logistic regression analysis indicated that being more easily angered ($p < 0.0001$, OR = 11.972, 95% CI: 6.275-22.843,) also increased the risk of attempted suicide. The risk of attempted suicide among elderly who were more easily angered was 11.972 times higher than that in elderly with stable emotions. Results are shown in Table 1. Emerging research has indicated that higher levels of anger increase the risk of suicide (10).

The current study directly compares the situation of the same elderly before and after a suicide attempt. This can fully reflect changes in the specific situation of the elderly over time; therefore, the results are more accurate and persuasive. A limitation of this study is that it sought to explore factors influencing suicide attempts but it is based on responses to only two questions. More scientific and authoritative scales should be used for future studies.

In conclusion, the current results reveal ways to reduce attempted suicide by the elderly. Feeling less interested in previous hobbies and being more easily angered are risk factors for attempted suicide in the elderly. The emotional state of the elderly can be adjusted through specific interventions. Therefore, family members and society need to pay attention to the emotional status of the elderly, promptly detect emotional deterioration, and promptly intervene in order to effectively prevent suicide.

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References

1. World Health Organization (WHO). Suicide worldwide in 2019: Global health estimates. <https://www.who.int/publications/i/item/9789240026643> (accessed October 16, 2022).
2. World Health Organization (WHO). Suicide rates: Suicide rates, crude, 10-year age groups. <https://www.who.int/data/gho/data/themes/mental-health/suicide-rates> (accessed October 16, 2022).
3. Wu CZ, Rong S, Duan WT, Wang WX, Yu LX. Effect of negative life events on suicide attempt: the mediating roles of basic psychological needs and psychache. *Chin J Clin Psych.* 2020; 28:503-507. (in Chinese)
4. Suominen K, Isometsä E, Haukka J, Lönnqvist J. Substance use and male gender as risk factors for deaths and suicide--A 5-year follow-up study after deliberate self-harm. *Soc Psychiatry Psychiatr Epidemiol.* 2004; 39:720-724.
5. Fei LP. The present situation and future work direction of suicide in China. *Chin J Epidem.* 2004; 25:277-279. (in Chinese)
6. Luo M, Li J, He Y. Research on suicide ideation of elderly people. *Sci Res Aging.* 2015; 3:41-57. (in Chinese)
7. Jing J, Zhang J, Wu XY. Suicide among the elderly people in urban China. *Pop Res.* 2011; 35:84-96. (in Chinese)
8. Shanghai Municipal People's Government. Shanghai Statistical Yearbook 2021. <https://tjj.sh.gov.cn/tjnj/20220309/0e01088a76754b448de6d608c42dad0f.html> (accessed October 20, 2022). (in Chinese)
9. Bennardi M, Caballero FF, Miret M, Ayuso-Mateos JL, Haro JM, Lara E, Arensman E, Cabello M. Longitudinal relationships between positive affect, loneliness, and suicide ideation: Age-specific factors in a general population. *Suicide Life Threat Behav.* 2019; 49:90-103.
10. Wilks CR, Morland LA, Dillon KH, Mackintosh MA, Blakey SM, Wagner HR; VA Mid-Atlantic MIRECC Workgroup; Elbogen EB. Anger, social support, and suicide risk in U.S. military veterans. *J Psychiatr Res.* 2019; 109:139-144.

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