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Study on Mental Resilience Trajectory and Influencing Factors of Family Members of Young Suicide Attempters Who Took Poison

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Abstract: Objective: To explore the psychological resilience trajectories and influencing factors of family members of young people who attempted suicide by taking poison. **Method:** A convenience sampling method was used to select 158 family members of young people who attempted suicide by taking poison and were admitted to a hospital in Zhejiang Province from November 2023 to October 2024 as the research subjects. The general information questionnaire, general self-efficacy scale, social support rating scale, simple coping style questionnaire, and 10-item Connor-Davidson resilience scale were used to investigate them. A total of 158 questionnaires were distributed during hospitalization, and 158 valid questionnaires were recovered. 10 cases were lost to follow-up 1 month after discharge, 14 cases were lost to follow-up at 3 months, and 18 cases were lost at 6 months. Finally, a total of 118 patients completed the questionnaire. **Result:** Finally, three psychological elasticity category trajectories were obtained: decreasing psychological elasticity level, stable psychological elasticity level, and increasing psychological elasticity level. Multiple logistic regression analysis results showed that C1 VS. C3: social support OR value 0.535, coping style OR value 0.929; C2 VS. C3: social support OR value 0.766. P values are all <0.05. **Conclusion:** Families of young people who attempt suicide by poisoning may exhibit different types of psychological resilience trajectories. Social support and coping styles are factors that influence the psychological resilience trajectory of family members of young people who have attempted suicide by taking drugs. In clinical practice, personalized intervention should be provided based on the characteristics of different patients.

Keywords: Suicide; Psychological Resilience; Trajectory; Family Members; Longitudinal Study

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1. Introduction

Suicidal behavior is a serious public health issue[1]. Suicide attempted is a self-inflicted act with the intent of death that results in physical injury but not death. A survey by the Beijing Psychological Crisis Research and Intervention Center shows that suicide is the first leading cause of death for people aged 15-34[2-4]. As medical treatment of poisoning has improved, the success rate of poisonings has increased, and suicides attempted due to poisonings have risen[5, 6]. The “Healthy China Initiative 2019-2030” and the Outline of the “Healthy China 2023” plan place special emphasis on the popularization of mental health for the whole population and the early intervention of psychological problems in key populations. In addition, with the development of the modern nursing model, the object of nursing extends from patients to family members. Family

members are the patient's delegated authority, as well as key supporters and primary caregivers. Suicide attempts by patients are not only damaging to themselves but also have a significant impact on the physical and mental health of their families. Family members are prone to negative emotions such as guilt, anxiety, depression, psychological distress, helplessness, and sadness[7, 8]. Furthermore, the sense of shame and stigma caused by suicide will further increase the pressure and burden of family members and even produce suicidal ideation[9-11]. Therefore, it is particularly important to pay more attention to the mental health status of the families of suicide attempters[12]. However, existing research has focused primarily on the physical and mental health of patients who have attempted suicide, with insufficient attention paid to their families. Only a few qualitative studies have explored the caregiving capacity and mental health of family members. This study used a longitudinal approach to investigate the trajectories of psychological resilience among family members of youth who attempted suicide by self-poisoning and to explore the factors that predict psychological resilience in family members, thereby informing the development of effective prevention and intervention programs.

2. Method

2.1 Study Population and Design

This study is a prospective cohort study. The convenience sampling method was used to select family members of young people who attempted suicide by self-poisoning from November 2023 to October 2024 in a tertiary hospital in Zhejiang Province as study subjects.

Participants who met the following criteria were included: (1) Families of young people who attempted suicide by self-poisoning; (2) Assumption of primary caregiving responsibilities upon hospitalization and return home; (3) Age ≥18 years; (4) Use of mobile communication technology. Families of patients who died during the study period after a suicide attempt were excluded from the study.

According to the principles of sample size estimation in multifactor analysis, the sample size is required to be 5-10 times the observed variables. There were 13 variables in this study, and the sample size was 78-156 cases, taking into account the 20% loss rate. A total of 158 participants were included in this study, of which 118 participants completed the longitudinal survey.

2.2 Ethics Approval

The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Ethics Committee of the First Affiliated Hospital of Wenzhou Medical University (KY2023-116).

2.3 Measures

2.3.1 Demographic Questionnaire

It was designed by the researcher after consultation with the experts of the research group based on the purpose of the study, including age, gender, marital status, residence, monthly income, education, occupation, relationship with patients, and number of patient suicides.

2.3.2 General Self-Efficacy Scale (RS-SC)

The scale was developed by German psychologist Schwarzer[13] and was translated into a Chinese version by Jianxin Zhang. The scale has a single-dimensional structure with 10 items. It is a four-point Likert scale which ranges from 1 point(totally incorrect) to 4 points (totally correct), with higher scores indicating higher levels of general Self-efficacy. The Cronbach α of RS-SC was 0.924 in the previous studies[14].

2.3.3 Social Support Rating Scale (SSRS)

The scale was developed by Shuiyuan Xiao with 10 items[15]. It has three dimensions including subjective support, objective support, and utilization of support. Scale scores of 12-22 points are classified as low level, 23-44 points as medium level, and 45-66 as high level, with higher scores indicating higher levels of social support. The Cronbach α of SSRS was 0.819 in the previous studies[16].

2.3.4 Simplified Coping Style Questionnaire (SCSQ)

The scale was developed by Yaning Xie[17] in 1998 to assess the behavioral patterns of individuals coping with distress, which is divided into 2 dimensions: positive coping (12 entries) and negative coping (8 entries). It is a four-point Likert scale which

ranges from 0 points (not used) to 3 points (often used). The Cronbach α of this scale is 0.90[18].

2.3.5 10-item Connor-Davidson Resilience Scale (CD-RISC-10)

The scale was translated and revised by Wang[19], which contains 10 entries, each rated on a 5-point Likert scale (0=almost never, 4=always) with a total score of 0-40. A higher total score on the scale represents a higher level of psychological resilience. The Cronbach's α is 0.91[20].

2.4 Data Collection

Data was collected by the researcher herself. Questionnaire survey and follow-up were conducted on the day of discharge (T1), 1 month after discharge (T2), 3 months after discharge (T3), and 6 months after discharge (T4). In the T1, a face-to-face survey was used to collect information from 158 participants including, demographic information, the General Self-Efficacy Scale, the Social Support Rating Scale, the Simple Coping Styles Questionnaire, and the Psychological Resilience Scale. In T2-4, 148, 134, and 118 participants provided complete 10-item Connor-Davidson resilience scale (SCSQ) data via WeChat, clinic visits, and phone calls. 40 cases did not complete follow-up due to poor adherence to follow-up, with an overall loss rate of 25.3%.

2.5 Statistical Analysis

Statistical analysis was performed using SPSS 26.0 and Mplus8.3. At first, we conducted a descriptive analysis of the demographic characteristics of the participants. Continuous variables were summarized as means and standard deviations with normal distribution patterns, or medians and interquartile ranges (IQRs) for non-normally distributed data, and categorical variables as rates or percentages. Second, we performed Latent Class Growth Analysis (LCGA) in Mplus version 8.3 to explore the trajectories of psychological resilience. Gradually increase the number of potential categories until optimal model fit is achieved. The lower the value of the Akaike information criterion (AIC), Bayesian information criterion (BIC), and sample size adjusted BIC (aBIC) of the model, the better the fit. The entropy represents the classification accuracy, which takes values from 0 to 1, and the larger value of it means the higher the accuracy. When entropy of 0.80 or greater, the accuracy of classification exceeds 90%. The significant p values for the LMR and BLRT indicate that a model with k classes is significantly better than a model with k-1 classes. Finally, We conducted χ^2 text， Independent Samples t-test, and multiple logistic regression analysis to explore predictors of the trajectories. $P<0.05$ indicating that the difference was statistically significant.

3. Result

3.1 Sociodemographic and Psychological Resilience of Participants

A total of 158 participants were enrolled in this study at baseline, and the relationships to the suicide attempters were 107 (67.7%) parents, 30 (19%) spouses, 8 (5.1%) children, 2 (1.3%) siblings, and 11 (7.0%) other relationships. A large proportion of participants 146 (92.4%) aged 18-60 years, and 136 (86.1%) were women. 121 (76.6%) participants were married, and 126 (79.7%) participants lived in the city. Many of the participants had a college or bachelor's degree in education (n=134,84.8%). Occupation was mainly workers (n=62,39.2%). Most participants reported a monthly family income of more than 5000 yuan (n=117, 74.1%). Most suicide attempters were first-time suicides (n=137,86.7%), as shown in Table 2.

The psychological resilience scores of participants were 17.43 ± 5.635, 17.74 ± 3.263, 17.56 ± 2.236, and 18.42 ± 4.549 in T1-4, respectively.

3.2 Latent Class Analysis

Participants who completed the four surveys were analyzed for potential categories of trajectories of change in psychological resilience, see Table 1. One to five latent psychological resilience classes were compared to identify the optimal model. AIC, BIC, and aBIC values decrease as the number of categories increases. when potential category is the 4-class, LMR values did not reach a significant level($P > 0.05$). when the potential category is the 5-class, LMR values did not reach a significant level($P > 0.05$), Entropy < 0.8, and the smallest group size is too small. This leads to low interpretability in clinical settings and a lack of credibility in replication. In summary, the results of the 3-class model were found to be superior to those of the other model.

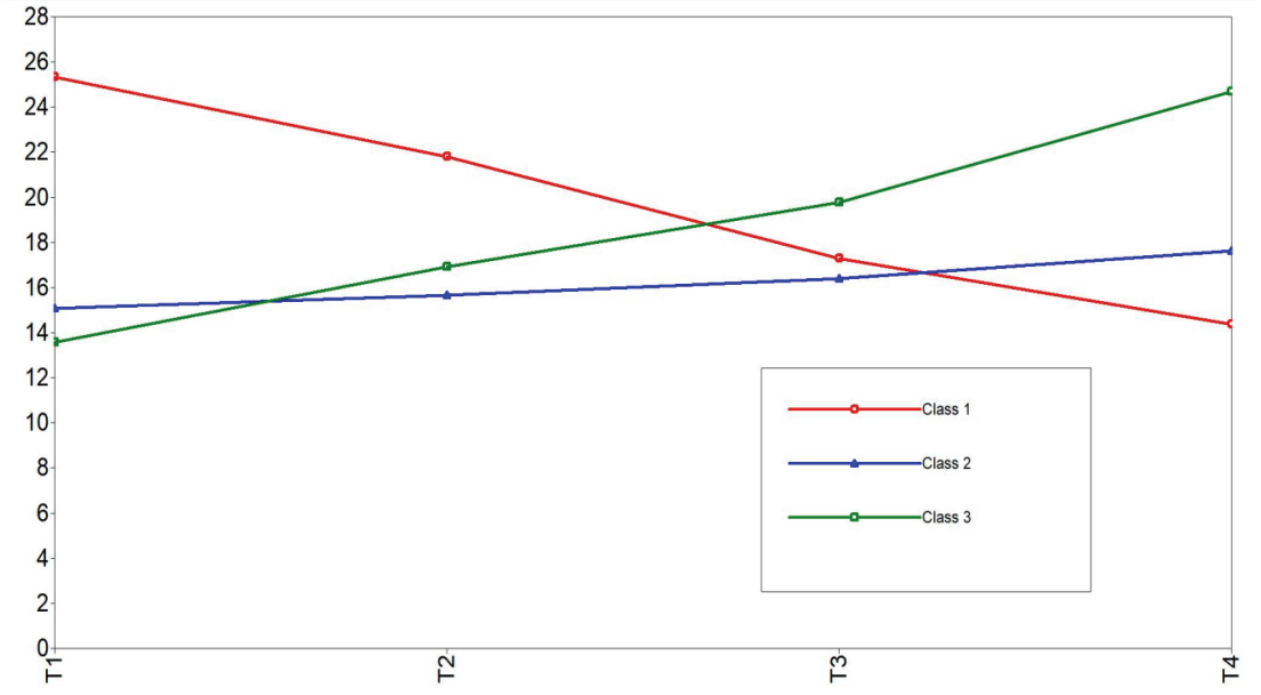
Table1 Results of LCGA model fitting for participants' psychological resilience

Model	AIC	BIC	aBIC	Entropy	LMR(P)	BLRT(P)	Conditional Probability
1	3063.311	3081.687	3062.694	-	-	-	1
2	2861.890	2889.454	2860.964	0.943	0.0000	0.0000	0.73/0.27
3	2785.731	2822.482	2784.497	0.817	0.0014	0.0000	0.27/0.51/0.22
4	2775.782	2821.721	2774.238	0.813	0.0987	0.0000	0.08/0.20/0.25/0.47
5	2760.942	2816.069	2759.090	0.780	0.3770	0.0000	0.32/0.20/0.16/0.08/0.24

3.3 Latent Class Naming

Model 3 categorises participants' trajectories of psychological resilience into 3-class, see Figure 1. ① We named Class 1 (C1) the high-low psychological resilience group, which Psychological resilience levels were high at T1, and tended to decrease during follow-up. There were 42 (27%) participants in the group (Intercept 23.596, slope -1.690, P=0.000). ② We named Class 2 (C2) the steady psychological resilience group. A total of 81 (51 %) participants were classified in this group. These participants had an average level of psychological resilience at T1, and the trend was not significant, remaining at a moderate level (Intercept 15.183, slope 0.408, p=0.000). ③ We named Class 3 (C3) the low-high psychological resilience group. In this group，psychological resilience in 35(22%) participants was low at T1 but increased progressively during follow-up(Intercept 14.644, slope 1.704, p=0.000).

Figure 1 Trajectory of development of a mixed model of growth of latent variable of psychological resilience of participants



Note: T1 is baseline (at discharge), T1, T2 and T3 are 1, 3 and 6 months after discharge, respectively.

3.4 Basic Characteristics of Trajectory Grouping

Basic characteristics and univariate analysis results of participants grouped according to different development tracks of psychological resilience. The results indicated that there were some differences between the participants in each subgroup in terms of the relationship with patient, first-time suicide, General self-efficacy, social support, coping style, all of which were statistically significant (Table 2).

Table2 Basic characteristics of trajectory grouping

Item	Total	C1(n=42)	C2(n=81)	C3(n=35)	χ2	P
Age					1.488	0.450
18-60	146(92.4)	39(92.9)	73(90.1)	34(97.1)		
>60	12(7.6)	3(7.1)	8(9.9)	1(2.9)		
Gander					0.563	0.755
male	22(13.9)	7(16.7)	10(12.3)	5(14.3)		
female	136(86.1)	35(83.3)	71(87.7)	30(85.7)		
Marital status					8.265	0.188
unmarried	20(12.7)	7(16.7)	10(12.3)	3(8.6)		
married	121(76.6)	33(78.6)	62(76.5)	26(74.3)		
divorced	9(5.7)	0(0)	7(8.6)	2(5.7)		
remarry	8(5.1)	2(4.8)	2(2.5)	4(11.4)		
Residence					3.636	0.162
city	126(79.7)	37(88.1)	60(74.1)	29(82.9)		
village	32(20.3)	5(11.9)	21(25.9)	6(17.1)		
Monthly household income					4.279	0.362
0-2999	18(11.4)	3(7.1)	10(12.3)	5(14.3)		
3000-5000	23(14.6)	6(14.3)	15(18.5)	2(5.7)		
>5000	117(74.1)	33(78.6)	56(69.1)	28(80)		
Education					1.341	0.889
Primary/Middle/High School	16(10.1)	3(7.1)	10(12.3)	3(8.6)		
College/Bachelor’s degree	134(84.8)	37(88.1)	66(81.5)	31(88.6)		
postgraduates	8(5.1)	2(4.8)	5(6.2)	1(2.9)		
Occupation type					3.957	0.873
worker	62(39.2)	18(42.9)	32(39.5)	12(34.3)		
farmer	24(15.2)	4(9.5)	15(18.5)	5(14.3)		
Institutional personnel	17(10.8)	4(9.5)	9(11.1)	4(11.4)		
freelance work	30(19)	7(16.7)	15(18.5)	8(22.9)		
unemployed	25(15.8)	9(21.4)	10(12.3)	6(17.1)		
Relationship with patients					20.680	0.002
parent	107(67.7)	31(73.8)	50(61.7)	26(74.3)		
spouse	30(19)	3(7.1)	23(28.4)	4(11.4)		
children	8(5.1)	4(9.5)	0(0)	4(11.4)		
brothers and sisters	2(1.3)	0(0)	2(2.5)	0(0)		
others	11(7.0)	4(9.5)	6(7.4)	1(2.9)		
first-time suicide					7.717	0.022
yes	137(86.7)	33(78.6)	76(93.8)	28(80)		
no	21(13.3)	9(21.4)	5(6.2)	7(20)		
General self-efficacy	23.82±6.66	15.71±2.13	23.77±2.37	33.66±2.29	191.436	0.000
Social support	24.01±6.96	15.17±1.91	24.22±2.22	34.11±2.39	485.656	0.000
Coping style	39.96±11.44	22.95±4.89	43.35±2.00	52.54±4.29	95.3	0.000

3.5 Logistic Regression Analysis of Influencing Factors of Psychological Resilience

Variables that were statistically significant in the one-way analysis of variance (the relationship with patient, first-time suicide, General self-efficacy, social support, coping style) were used as independent variables, and the trajectory attribution category was included in the multiple logistic regression analysis as the dependent variables. Multiple logistic regression analysis was performed using the "low-high psychological resilience group" as a reference group. The results showed that the model could explain the effect of factors influencing the trajectory of psychological resilience in the families of young people attempting suicide by taking poison. The model is statistically significant($P<0.05$). Social support and coping styles as influences on potential categories of participants' psychological resilience trajectories
($P<0.05$), as show in Table 3.

Table3 Logistic regression analysis of influencing factors of psychological resilience

eDependent variable	Independent variable	β	SE	Waldχ2	P	OR	95%CI
C1 VS. C3	Constant	15.962	3.204	24.811	0.000		
	Social support	-.625	0.095	43.022	0.000	0.535	0.444-0.645
	Coping style	-.074	0.034	4.865	0.027	0.929	0.870-0.992
C2 VS. C3	Constant	7.904	2.476	10.188	0.001		
	Social support	-.267	0.057	22.175	0.000	0.766	0.685-0.856

4. Disscussion

4.1 Trajectory Analysis of Psychological Resilience in the Families of Young People Attempting Suicide by Drug Use

The study identified three different trajectories of psychological resilience, named "low-high psychological resilience group", "high-low psychological resilience group", and "steady psychological resilience group". It reflects the group heterogeneity of psychological resilience of the family members of young people who took poison to attempt suicide. About 27 % of the family members of young people who had attempted suicide by taking poison showed a decreasing level of psychological resilience. They may have experienced great psychological shock and stress when confronted with a loved one's attempted suicide, leading to a reduction in their psychological resilience. The possible causes are as follows: Firstly, a loved one's suicide attempt can be an extremely traumatic experience for families, which predisposes them to psychological trauma and affects their psychological resilience[21]. Secondly, young people are important pillars of a family and play a vital role in the family. Families may experience continued anxiety and worry, fearing the recurrence of similar incidents. In addition, Family members may blame themselves because they failed to prevent their loved one's suicidal behavior and the patient's condition is getting progressively worse. This sense of self-blame may lead to negative emotions and doubts about their abilities, which can affect psychological resilience[22]. Besides, they may develop a sense of uncertainty and fear about the future, which challenges psychological resilience. Worse still, the social stigma attached to suicide may make families feel socially excluded or suspicious, which may increase the risk of reduced psychological resilience[23]. Ultimately, the complexity of the patient's condition may also require long-term hospitalization or outpatient follow-up, which can easily create a burden on family members who are under financial pressure and have difficulties accessing medical care[24]. This suggests that the initial level of psychological resilience in the families of young people attempting suicide does not represent the trend of psychological resilience after long-term treatment and that the characteristics of the dynamic development of psychological resilience and inter-individual differences must be taken into account. Healthcare professionals should assess early and take effective interventions to improve the psychological resilience of family members of suicide attempters.

Another approximately 51% of participants were in the group with a stable level of psychological resilience. Suicide attempters in this category are likely to be impulsive suicides, which are regretted afterward and regret, and the condition is mild with no impact on quality of life. Therefore, the level of psychological resilience of their dependents was affected to a limited extent. In addition, families may learn to cope with their own and their loved one's emotions and gradually adjust to

the new reality.

The remaining 22% of participants showed an upward trend in their level of psychological resilience. Here are some possible reasons: (1) The Healing Power of Time: Over time, the initial shock and pain may lessen, giving families a chance to adapt and adjust. (2) Professional psychological support[25]: Families may have sought professional mental health support, such as the help of a psychologist. Psychologists may provide emotional comfort, problem-solving skills, and coping strategies to help families gradually recover and increase psychological resilience. (3) Patients in this category tend to be sicker, and the psychological resilience of family members is improved as they learn some life lessons in the course of caring for the patient and instead grow in the face of adversity. This suggests that healthcare professionals should pay more attention to family members with low levels of psychological resilience and guide them to face the difficulties they encounter with a positive mindset.

4.2 Factors Influencing the Trajectory of Psychological Resilience in Family Members of Youth Drug-related Suicide Attempts

Multiple logistic regression analysis results indicated that social support has a significant predictive effect on the psychological resilience trajectory of the families of young people who attempted suicide by taking poison. That is, social support is a protective factor in the developmental trajectory of psychological resilience. This may be since social support helps to build and maintain social networks, increase social engagement, reduce feelings of isolation, and make them more able to cope with adversity more positively. Higher levels of social support not only provide greater understanding, concern, and encouragement for families but also have a therapeutic function by helping to reduce stress and create a buffering effect in times of difficulty[26]. These enable individuals to maintain relative emotional stability even in stressful scenarios. In addition, social support also includes practical help, such as assistance with daily chores, financial support, or assistance in caring for family members. This helps to reduce the burden on families and makes it easier for them to cope with stress, thus maintaining psychological resilience. This is similar to the findings of previous studies. A longitudinal follow-up survey shows that social relationships are better predictors of health than bioeconomic factors[27]. Another study suggests that patients who seek and receive support from close relationships are at a lower risk of developing PTSD. Whereas the level of psychological resilience declined in the absence of supporters. Moreover, coping styles were significant predictors of trajectories of psychological resilience in the families of youth suicide attempters. This suggests that proactive problem-solving and help-seeking coping styles may be able to help individuals enhance their psychological resilience[28]. This is also confirmed by Nan Zhang's study on caregivers for patients with chronic obstructive pulmonary disease[29].

5. Conclusion

Overall, our study revealed 3 types of developmental trajectories of psychological resilience in family members of youth who attempted suicide by taking poison. Social support and coping style may be two factors affecting the families' psychological resilience track. Clinicians can intervene based on the protective factors of the psychological resilience trajectory.

6. Limitation

Our study has several limitations. First, we explored only preliminarily the variability across psychological resilience trajectories. Moreover, the study included a geographically homogenous study population, which resulted in a relatively underrepresented study. The follow-up study will be a multi-center, large-sample study to inform the development of interventions.

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Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

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