ORIGINAL RESEARCH

Impact of Bullying Victimization on Chinese College Students' Suicidal Tendency: The Moderating Effect of Teachers' Emotional Support and Family Support

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Objective: To explore the influence of bully victims on the suicidal tendencies of college students, and the moderating role of teacher emotional support and family support in the relationship between bully victims and college students' suicidal tendencies, in order to provide a reference for the effective intervention of college students' suicide behavior.

Methods: Based on a survey of 15,560 college students. Multiple stepwise regression and Interaction analysis explore the impact of the bully victimization on college students' suicidal tendencies and the moderating role of family support and teacher emotional support in the relationship between the bully victim and college students' suicidal tendencies.

Results: This study found that the Suicidal Tendencies score of college students was 19.79 points, indicating that some college students have a risk of suicidal tendencies; secondly, verbal bullying ($\beta = 0.084$, $P < 0.001$), physical bullying ($\beta = 0.222$, $P < 0.001$) and social relationship bullying ($\beta = 0.122$, $P < 0.001$) have a positive and significant impact on the suicidal tendencies of college students; in addition, family support and teacher emotional support have a significant regulatory effect on the bully victim and college students Suicidal Tendencies and family support. The regulating effect was significantly higher than that of teacher emotional support.

Conclusion: Chinese college students have the risk of suicidal tendencies; peer bullying victimization is an important reason for affecting college students' suicidal tendencies, teacher emotional support is a protective factor for bully victims to affect college students' suicidal tendencies, and family support has a significant moderating effect on the bully victim and college students' suicidal tendencies. Therefore, it is necessary to actively adopt home-school linkage and home-school communication to reduce campus violence and increase the psychological resilience of college students.

Keywords: bully victim, teachers' emotional support, family support, suicidal tendencies, college students

Introduction

Suicidal behavior has become a significant public health problem worldwide.[1] In 2019, more than 700,000 people died of suicide worldwide.[2] At the same time, the suicide rate among adolescents has also increased in the past ten years.[3] Lim et al also pointed out that more than 14% of Chinese adolescents had suicidal ideation in the past year, and 4.5% had attempted suicide.[4] As college students, they are often faced with more outstanding academic, employment, economic, emotional, and other pressures. Suicidality refers to the individual's motivation and tendency to experience suicidal behavior, including all other suicide-related phenomena other than attempted suicide, including suicidal ideation, suicide planning, and suicide attempts, which are the main predictors of suicidal behavior.[5] College students are leaving the closed environment of high school and entering the stage where they need to face various social problems alone. It is straightforward to have conflicts and receive bullying from their peers, which in turn causes tremendous psychological pressure on them, which can easily lead to depression—suicidal tendencies. Ji believes suicidal tendencies can be an

essential risk factor for suicidal behavior.[6] Studies have also confirmed that 76% of suicide attempters have an interval of no more than 2 hours from suicidal ideation to suicidal behavior.[7] Therefore, from the perspective of preventing problems before they happen, it is significant to explore the influencing factors of adolescent suicidality and the mechanisms behind these factors.

As an essential factor affecting mental health, adverse life events, especially bullying victimization, are gradually attracting the attention of scholars.[8] Bullying victimization is generally considered to be repeated intentional harm to individuals, mainly reflected in the power inequality between the perpetrator and the victim, including physical, verbal, and social relationship bullying.[9] Many studies have shown that bullying victimization may persistently negatively impact adolescents' internalized emotional regulation and externalized behavioral performance.[10] On the one hand, according to the organism-environment interaction theory, the interaction between psychological traits and external situations may affect individual psychosocial adaptation.[11] As a negative life situation, long-term bullying and victimization may damage adolescents' mental health, causing insomnia, loneliness, tension, anxiety, depression, and other negative emotions, and even lead to the emergence of suicidal tendencies and suicidal behaviors.[12] On the other hand, being bullying victims may cause a series of physical health problems for the bullied, which in turn promotes the appearance of a series of aggressive behaviors and aggravates their suicidal tendencies.[13] What is more serious is that due to improper education and guidance from society, schools, and families, some teenagers have suffered from bullying for a long time and failed to solve this problem through correct methods. This potential harm may lead to suicidal tendencies and suicidal behaviors in college age and adulthood.[14] Thomas' research results also show that different forms of bullying victimization, such as physical bullying, emotional bullying and cyber bullying, all have a huge impact on adolescents' psychological stress and can also reduce emotional well-being.[15] Most of the current research has intensely demonstrated the relationship between bullying victimization and suicidal ideation, and exploring the protective factors that affect the relationship between the two has paramount practical significance for maintaining college students' physical and mental health. Therefore, this study hypothesizes that bullying victimization is positively associated with college students' suicidal tendencies.

Family support refers to the emotional and spiritual support and comfort given to the individual by the family in which the individual lives.[16] As an essential component of social support, family support may be an important protective factor for suicidal ideation in adolescents who are victims of bullying.[17] Freud believed that the experience of others is crucial to the development of an individual, and family support from family members such as parents in early experiences undoubtedly has a profound impact on the individual.[18] Low-income family support may cause individuals to exhibit more mental health problems, and they cannot obtain psychological support from family members and skills to solve problems and defuse crises.[19] Therefore, in the presence of bullying victims, adolescents who lack family support may have explosive, aggressive behaviors and even suicidal tendencies. Under the depression of long-term emotional loss, college students who lack family support may have suicidal ideation or self-destruction during adverse life events such as bullying and victimization.[20,21] In addition, Roque found in a descriptive phenomenological study the phenomenon of masking in bullying victimized adolescents: that is, the individual's defensive behavior against external maliciousness. In the process of bullying and victimization, individuals gradually distrust social groups. They will use lies to encrypt personal pain and emotional expression, resulting in social isolation. The vulnerability of family support will significantly increase the possibility of suicidal tendencies.[22] However, some scholars believe that family support may mediate between bullying victimization and suicidality in different individuals. Tanigaw found that family support from parents mainly alleviated depression and suicidality among male bullying victims.[23] However, Veenstra believes that the moderating effect of family support is mainly reflected in the bullied low-grade female group.[24] Therefore, this study hypothesizes that family support moderates the relationship between bullying victimization and suicidality among college students.

Although existing studies have shown that social support,[22] parental supervision,[17] and peer help[25] can all play a protective role in the process of bullying victimization affecting adolescent suicidal tendencies, college students play more independent roles on campus, and besides family support, their more protective factors come from the emotional tolerance given to them by school teachers. Teachers are essential to others who are directly in close contact with college students, and their influence on the development of college students is mainly reflected in the support they

provide to teachers.[26] Teacher support is one of the critical predictors of college students' suicidal tendencies. Mental health and suicidality play a vital protective role.[27] According to the stress buffer model, as supportive adults, the support provided by teachers can give individuals with emotional support and potential ways to deal with stress, thereby alleviating the impact of bullying and victimization on them and reducing the risk of suicide among college students.[28] However, some studies suggest that teacher support does not prevent the generation of suicidal tendencies in bullied college students. Park, for instance, conducted a study on 5351 adolescents to explore the moderating effect of parental and teacher support on the relationship between sample bullying victimization and suicidality, and the results showed that only parental support moderated the relationship between the two.[29] Han et al believe that teacher support has a significant protective effect on the relationship between bullying victimization and suicidal tendency in the traditional sense, but the effect is limited. In contrast, teacher support found no significant interaction effect in the relationship between cyberbullying victimization and suicidality in their study.[30] Given this, this study hypothesizes that teachers' emotional support moderates the relationship between bullying victimization and suicidal tendency in college students.

Materials and Methods

Participants

From September to October 2022, using a convenient random sampling method, first nine provinces (municipalities) were selected of Guangdong, Jiangsu, Shandong, Shanghai, Anhui, Hebei, Yunnan, Shanxi, and Gansu according to the GDP of each province (municipality) in China, and then, according to the classification of colleges and universities, a total of 27 colleges and universities were selected from independent colleges, general public undergraduates, and critical colleges and universities (double first-class), which enabled to reduce the bias and error caused by the investigators. Each university distributed 600. 16,200 questionnaires and recovered 15,560 valid questionnaires, with a recovery rate of 96.049%, Inclusion criteria: (1) college students; (2) No mental illness. Exclusion criteria: (1) no signed informed consent; (2) Not cooperating with investigators. This study including 7427 males and 8133 females. Moreover, this study obtained the informed consent of all respondents. It was approved by the Ethics Committee of Kangda College of Nanjing Medical University (2022–1), and written consent was obtained from the surveyed students and their parents. The study follows the 1964 Declaration of Helsinki.

Measures

General Questionnaire

The questionnaire was designed by the research group and collected information about gender (male=1, female=2) and age (≤19 years old=1, 20~21 years old=2, 22~23 years old=3, ≥24 years old=4) among Chinese college students), grade (freshman = 1, sophomore = 2, junior = 3, senior = 4), household registration (non-agricultural household registration = 1, agricultural household registration = 2), and sleep status in the past two weeks (very bad = 1, bad=2, general=3, good=4, very good=5) and other information.

College Students' Suicidal Tendencies

The Suicidal Tendencies Scale for College Students is mainly based on the Suicidal Behaviors Questionnaire-Revised (SBQ-R) designed and compiled by Osman.[31] This scale uses the suicide stress-diathesis model theory to measure the actual situation of Chinese colleges and universities to measure the suicidal tendencies of college students. The scale includes five dimensions and 23 items, precisely: stressful events (6 items), mental disorders (7 items), hopelessness (4 items), suicide attempts (3 items), negative coping (3 items) item), using a 5-level scoring method (0–4 points) for rating, the total score ranges from 0–92 points, and a total score ≥ 21 points indicates that there are suicidal tendencies. The scale's overall Cronbach's α coefficient is 0.899, the KMO is 0.887, and the Cronbach's α coefficients of each dimension are 0.809, 0.734, 0.799, 0.870, and 0.754, respectively, indicating that the scale has good reliability and validity.

Delaware Bully Victim Scale

The Delaware Bullying Victimization Scale-Student (DBVS-S) was used to measure the level of bullying by peers on campus among college students.[32] This scale mainly measures the frequency of college students being bullied by peers in campus life, with a total of 3 dimensions 12 Items: verbal bullying (4 items), physical bullying (4 items), social relationship bullying (4 items), using a 5-level scoring method (0~4), the total score is between 0~48 points. The higher the score, the higher the degree of bullying victim. The scale's overall Cronbach's α coefficient is 0.947, the KMO is 0.951, and the Cronbach's α coefficients of each dimension are 0.889, 0.907, and 0.867, respectively, indicating that the scale has good reliability and validity.

Perceived Teacher Emotional Support Scale

Herman developed the scale based on the theory of teacher emotional support to measure the respondents' actual feelings about teacher emotional support two weeks before the measurement.[33] The scale has 18 items in 4 dimensions, including positive atmosphere (5 items), teacher sensitivity (5 items), concern for students (5 items), and student satisfaction (3 items). The grade scoring method, ranging from strongly disagree to agree strongly, is counted as 1–7 points, and the total score ranges from 18–126 points. The higher the score, the higher the perceived teacher's emotional support. The overall Cronbach's α coefficient of the scale is 0.920, and the KMO is 0.937.

Perceived Family Support Scale

This study refers to the Perceived Social Support Scale compiled by Zimet,[34] divided into three dimensions: family support, friend support, and other support, with four items in each dimension. This study only includes the family support dimension as a measure of college students' perception of family support. Likert 7-point scoring method is used to measure the degree of family support. The scoring ranges from strongly disagree (1 point) to strongly agree (7 points). The total score ranges from 4 to 28 points. The higher the sensitivity. The overall Cronbach's α coefficient of the scale is 0.933, and the KMO is 0.852, indicating that the perceived family support scale has good reliability and validity.

Quality Control

This research relies on the questionnaire QR code and online link generated in the questionnaire star platform, and the research team filled it in advance to find and correct the problems. The investigators communicated with the teaching and counseling staff of the target colleges and departments in advance, thoroughly explained the purpose of the investigation, and entrusted the latter to distribute the questionnaires to the undergraduates in the colleges and departments to fill in. College students scan the QR code or click the link to complete the form.

Data Analysis

Excel software was used for real-time statistical data input, and SPSS 26.0 software was used for statistical description. The count data was described by frequency, while the measurement data were described by mean ± standard deviation. In addition, variables were assigned to demographic factors and multivariate. The influence of bully victimization on college students' suicidal tendencies was comprehensively analyzed by stepwise regression, and the moderating effect of teacher emotional support and family support on bully victims and college students' suicidal tendencies was explored by using interactive analysis.

Results
Descriptive Data

The single-factor study found that gender, age, grade, household registration, and sleep had statistically significant differences in the scores of various dimensions of college students' suicidal tendencies (P <0.01). Among them, males scored higher for stressful events, mental disorders, hopeless moods, and suicide attempts. Their overall suicidal tendencies score is higher than that of women; compared with other age groups, college students younger than 19 years old have the highest scores on the stressful event and suicide attempts, while college students older than 24 years

old have the highest scores on mental disorder and negative coping. Compared with other grades, first-year students scored higher in the stressful event and suicide attempt, sophomore students scored higher in mental disorder, hopeless mood, negative coping, and overall suicidal tendencies; agricultural household registration scored higher in the stressful event, mental disorder, the scores of hopeless mood, suicide attempt, and overall suicidal tendencies are higher than those of non-agricultural household registration; the worse the sleep quality is, the higher the scores of suicidal tendencies and its various dimensions are (Table 1).

Correlation Analysis

It was found that the overall suicidal tendencies score was 19.79±15.64 points, slightly lower than 21 points, indicating that Chinese college students have suicidal tendencies to a certain extent. The scores of each dimension were stressful event (3.27±4.91) points, mental disorder (6.20±6.01) points, hopeless mood (4.46±2.81) points, suicide attempt (1.59±2.66) points, negative coping (4.27±2.47) points, The overall bully victim score was 3.54±8.19 points, and the scores of each dimension were verbal bullying (1.44±3.06) points, physical bullying (0.93±2.73) points, and social relationship bullying (1.17±2.85) points. The teacher emotional support and family support scores were 54.47±12.43 and 20.56±5.19,

Table 1 Comparison of the Scores of Different Dimensions of College Students' Suicidal Tendencies with Different Demographic Characteristics

Item	Number of People (n/%)	SE ($\bar{x} \pm s$)	MD ($\bar{x} \pm s$)	HM ($\bar{x} \pm s$)	SA ($\bar{x} \pm s$)	NC ($\bar{x} \pm s$)	ST ($\bar{x} \pm s$)
Gender							
Male	7427 (47.73)	3.61±5.27	6.54±6.32	4.65±2.90	1.83±2.90	4.21±2.59	20.84±16.38
Female	8133 (52.27)	2.97±4.53	5.88±5.70	4.29±2.71	1.37±2.41	4.33±2.35	18.83±14.87
t		8.19	6.90	8.05	10.83	−2.89	8.05
P		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Age (year)							
≤19	4206 (27.03)	3.42±5.22	6.13±6.09	4.35±2.89	1.64±2.79	4.10±2.54	19.65±16.36
20–21	6386 (41.04)	3.28±4.71	6.47±6.04	4.68±2.78	1.59±2.59	4.52±2.37	20.53±15.17
22–23	4019 (25.83)	2.84±4.32	5.61±5.72	4.30±2.66	1.40±2.42	4.15±2.46	18.30±14.49
≥24	949 (6.10)	2.57±4.17	6.59±5.37	4.27±2.23	1.59±2.41	4.53±1.91	19.55±13.57
F		10.39	11.20	18.19	4.52	33.35	10.86
P		<0.001	<0.001	<0.001	0.004	<0.001	<0.001
Grade							
Freshman	5703 (36.65)	3.64±5.56	6.13±6.37	4.28±3.04	1.78±3.01	3.97±2.64	19.81±17.24
Sophomore	3174 (20.40)	3.33±4.75	6.65±5.94	4.67±3.64	1.55±2.52	4.49±2.32	20.70±15.13
Junior	4919 (31.61)	2.98±4.37	6.13±5.80	4.52±2.75	1.44±2.42	4.41±2.43	19.48±14.45
Senior	1764 (11.34)	2.79±4.21	5.78±5.52	4.47±2.45	1.47±2.31	4.45±2.12	18.96±14.18
F		22.41	9.44	14.37	17.12	45.59	5.86
P		<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Household registration							
Non-agricultural household registration	8461 (54.38)	3.07±4.80	6.12±5.82	4.44±2.68	1.47±2.54	4.31±2.36	19.41±15.03
Agricultural household registration	7099 (45.62)	3.51±5.02	6.29±6.23	4.49±2.96	1.74±2.80	4.22±2.58	20.25±16.32
t		−5.62	−1.76	−1.08	−6.32	2.36	−3.34
P		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sleep status							
Very bad	518 (3.33)	6.65±6.81	10.10±7.41	6.38±3.28	3.18±3.67	5.63±2.60	31.94±20.33
Bad	1067 (6.86)	4.71±5.42	8.31±6.15	5.88±2.39	2.36±2.78	5.36±2.16	26.61±15.26
General	5087 (32.69)	3.69±4.95	7.16±5.87	5.00±2.57	1.70±2.61	4.83±2.18	22.38±15.06
Good	4584 (29.46)	3.01±4.52	5.97±5.78	4.42±2.75	1.57±2.70	4.30±2.33	19.26±14.68
Very good	4304 (27.66)	2.30±4.52	4.31±5.55	3.27±2.70	1.11±2.38	3.15±2.55	14.14±14.50
F		144.29	242.31	405.06	108.94	418.13	331.45
P		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Abbreviations: SE, Stressful Event; MD, Mental Disorder; HM, Hopeless Mood; SA, Suicide Attempt; NC, Negative Coping; ST, Suicidal Tendencies.

Table 2 Analysis of Correlation Results

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. TES	1											
2. FS	0.49***	1										
3. VB	−0.19***	−0.20***	1									
4. PB	−0.13***	−0.16***	0.82***	1								
5. SRB	−0.17***	−0.18***	0.85***	0.78***	1							
6. BV	−0.17***	−0.19***	0.94***	0.95***	0.95***	1						
7. SE	−0.19***	−0.26***	0.42***	0.43***	0.44***	0.46***	1					
8. MD	−0.35***	−0.43***	0.41***	0.42***	0.42***	0.44***	0.69***	1				
9. HM	−0.39***	−0.48***	0.39***	0.37***	0.39***	0.40***	0.53***	0.69***	1			
10. SA	−0.17***	−0.22***	0.40***	0.44***	0.42***	0.45***	0.87***	0.62***	0.52***	1		
11. NC	−0.45***	−0.48***	0.26***	0.23***	0.27***	0.27***	0.23***	0.55***	0.71***	0.22***	1	
12. ST	−0.36***	−0.44***	0.47***	0.48***	0.48***	0.50***	0.86***	0.92***	0.81***	0.81***	0.61***	1
Mean	54.47	20.56	1.44	0.93	1.17	3.54	3.27	6.20	4.46	1.59	4.27	19.79
SD	12.43	5.19	3.06	2.73	2.85	8.19	4.91	6.01	2.81	2.66	2.47	15.64

Note: ***P <0.001.
Abbreviations: TES, Teacher Emotional Support; FS, Family Support; VB, Verbal Bullying; PB, Physical Bullying; SRB, Social Relationship Bullying; BV, Bully Victim; SE, Stressful Event; MD, Mental Disorder; HM, Hopeless Mood; SA, Suicide Attempt; NC, Negative Coping; ST, Suicidal Tendencies.

respectively. According to the correlation analysis, it was found that teacher emotional support, family support, and other variables were all negatively correlated, with correlation coefficients ranging from 0.13 to 0.48. In contrast, bully-victims were positively correlated with suicidal tendencies, with correlation coefficients ranging from 0.26 to 0.50 (Table 2).

Analysis of the Influence of Bullying Victimization on the Suicidal Tendencies of College Students

Taking the dimensions of college students and the overall suicidal tendencies as dependent variables, gender, age, grade, household registration, and sleep as control variables, teacher emotional support and family support as moderator variables, and bullying victimization dimensions as independent variables, the first step is only to add control variables. In the second step, each dimension of the bullying victimization is added to adjust the variable, to explore the influence of bullying victimization on the suicidal tendencies of college students. Multiple stepwise regression results found that after adding bully victims, the ΔR^2 of each dimension of college students' suicidal tendencies increased to varying degrees, among which the suicide attempt increased from 0.081 to 0.235, and the overall suicidal tendencies increased from 0.254 to 0.408. Both increased by 15.4%, which also shows that bullying victim is an essential factor affecting the suicidal tendencies of college students. In addition, for male college students, the lower the grade and the agricultural household registration was, the worse was the sleep quality, the agricultural household registration, the worse the sleep quality, the lower the perceived teacher emotional support, the lower the perceived family support, the higher the frequency of verbal bullying, the higher the frequency of physical bullying, and the higher the frequency of social relationship bullying. Stressful events and mental disorders are more likely to occur, and the probability of overall suicidal tendencies is higher (P <0.05), male, older, lower grade, agricultural household registration, poorer sleep quality, and lower teacher emotional support, the lower the degree of perceived family support, the higher the frequency of verbal bullying, the higher the frequency of physical bullying, and the higher the frequency of social relationship bullying, the higher the probability of having hopeless mood and suicide attempt (P <0.05), the higher the female and the higher the grade. College students with higher education, agricultural household registration, poorer sleep quality, lower perceived teacher emotional support, lower perceived family support, and higher frequency of social relationship bullying are more likely to have negative coping (P <0.05) (Table 3).

Table 3 Multiple Stepwise Regression Results of Bully Victim's Impact on College Students' Suicidal Tendencies

| Variables	SE		MD		HM		SA		NC		ST	
	First Step	Second Step	First Step	Second Step	First Step	Second Step	First Step	Second Step	First Step	Second Step	First Step	Second Step
Gender	−0.045*** (0.076)	−0.018* (0.070)	−0.039*** (0.086)	−0.015* (0.080)	−0.052*** (0.039)	−0.031*** (0.037)	−0.069*** (0.042)	−0.041*** (0.038)	0.027*** (0.034)	0.036*** (0.033)	−0.046*** (0.221)	−0.018** (0.198)
Age	0.036** (0.079)	0.014 (0.073)	0.039** (0.090)	0.020 (0.083)	−0.010 (0.040)	0.026* (0.038)	0.052*** (0.043)	0.029* (0.040)	−0.006 (0.035)	−0.014 (0.034)	0.033** (0.230)	0.010 (0.205)
Grade	−0.136*** (0.060)	−0.052*** (0.055)	−0.114*** (0.068)	−0.041*** (0.063)	−0.039** (0.031)	−0.023* (0.029)	−0.130*** (0.033)	−0.043*** (0.030)	−0.005 (0.027)	0.027* (0.026)	−0.117*** (0.174)	−0.031** (0.156)
Household registration	0.078*** (0.076)	0.043*** (0.070)	0.062*** (0.086)	0.032*** (0.080)	0.063*** (0.039)	0.037*** (0.036)	0.080*** (0.041)	0.044*** (0.038)	0.032*** (0.033)	0.016* (0.033)	0.078*** (0.219)	0.043*** (0.196)
Sleep status	−0.116*** (0.037)	−0.097*** (0.035)	−0.101*** (0.043)	−0.086*** (0.040)	−0.147*** (0.020)	−0.133*** (0.018)	−0.091*** (0.021)	−0.077*** (0.019)	−0.134*** (0.017)	−0.125*** (0.017)	−0.138*** (0.111)	−0.120*** (0.099)
TES	−0.082*** (0.004)	−0.037*** (0.003)	−0.179*** (0.004)	−0.142*** (0.004)	−0.182*** (0.002)	−0.149*** (0.002)	−0.080*** (0.002)	−0.040*** (0.002)	−0.254*** (0.002)	−0.235*** (0.002)	−0.181*** (0.010)	−0.137*** (0.009)
FS	−0.188*** (0.009)	−0.132*** (0.008)	−0.324*** (0.010)	−0.275*** (0.009)	−0.352*** (0.004)	−0.310 (0.004) ***	−0.171*** (0.005)	−0.116*** (0.004)	−0.317*** (0.004)	−0.299*** (0.004)	−0.326*** (0.025)	−0.269*** (0.022)
VB		0.103*** (0.022)		0.071*** (0.025)		0.084*** (0.012)		0.039** (0.012)		0.020 (0.010)		0.084*** (0.063)
PB		0.196*** (0.028)		0.211*** (0.032)		0.143*** (0.015)		0.310*** (0.015)		0.007 (0.013)		0.222*** (0.079)
SRB		0.126*** (0.029)		0.084*** (0.033)		0.088*** (0.015)		0.073*** (0.016)		0.141*** (0.014)		0.122*** (0.082)
Cons	11.261*** (0.268)	7.523*** (0.257)	21.297*** (0.303)	17.439*** (0.294)	12.299*** (0.137)	10.706*** (0.135)	5.546*** (0.147)	3.652*** (0.140)	10.919*** (0.118)	10.161*** (0.122)	61.321*** (0.776)	49.481*** (0.725)
ΔR^2	0.096	0.246	0.229	0.342	0.285	0.367	0.081	0.235	0.305	0.329	0.254	0.408
F	237.030	509.317	662.383	809.528	886.996	903.812	196.963	479.059	974.973	765.333	756.928	1072.568

Notes: The standard errors are in parentheses, and the standardized coefficients are above the parentheses *P <0.05, **P <0.01, ***P <0.001.
Abbreviations: TES, Teacher Emotional Support; FS, Family Support; VB, Verbal Bullying; PB, Physical Bullying; SRB, Social Relationship Bullying; BV, Bully Victim; SE, Stressful Event; MD, Mental Disorder; HM, Hopeless Mood; SA, Suicide Attempt; NC, Negative Coping; ST, Suicidal Tendencies.

The Interactive Effects of Bullying Bully Victimization, Teacher Emotional Support, and Family Support on the Suicidal Tendencies of College Students

According to the interaction analysis, the unstandardized coefficients of the product of teacher emotional support and physical bullying on the stressful events, mental disorders, hopeless mood, suicide attempts, negative coping, and suicidal tendencies are 0.005, 0.006, 0.003, 0.003, 0.001, 0.019 ($P < 0.001$). Therefore, it can be concluded that teacher emotional support has an excellent regulating effect. Figure 1 shows that teacher emotional support has a better-regulating effect on college students' mental disorders and overall suicidal tendencies.

The unstandardized coefficients of family support and bullying victimization on stressful events, mental disorders, hopeless mood, suicide attempt, negative coping, and overall suicidal tendencies are 0.014, 0.016, 0.006, 0.007, 0.004, 0.047 ($P < 0.001$). Therefore, it can be concluded that family support also has an excellent regulating effect. It can be seen from Figure 2 that the regulating effect of family support is significantly higher than that of teacher emotional support, and family support has the best-regulating effect on the bully victims, hopeless mood, negative coping, and overall suicidal tendencies.
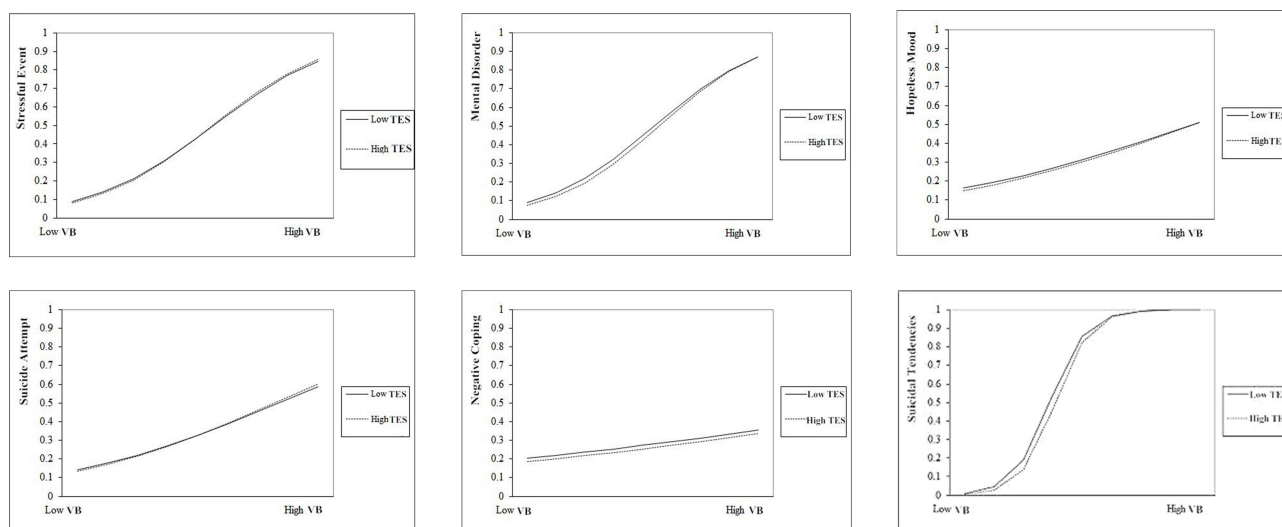
Figure 1 The interaction between teacher emotional support and bully victim on the various dimensions of college students' suicidal tendencies.
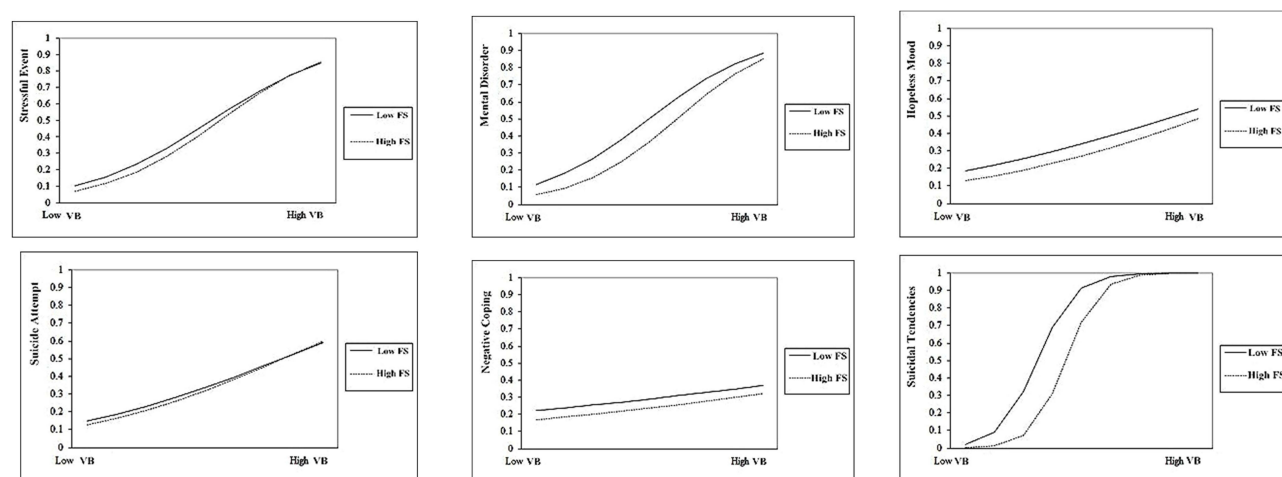
Figure 2 The interaction between family support and bully victim on the various dimensions of college students' suicidal tendencies.

Discussion

Chinese College Students Have High Suicidal Tendencies

The study found that the overall suicidal tendencies score of Chinese college students is relatively high, close to the standard line of 21 points for obvious suicidal tendencies,[31] which shows that Chinese college students have a risk of suicidal tendencies. This result confirms, to a certain extent, the high detection rate of self-injury among current Chinese students. Living in a new environment, college students' pressure of study, survival, and improper handling of relationships with classmates are likely to cause various adverse psychological problems. It can easily lead to suicidal intentions.[35] Therefore, the education department should be more explicit about the root causes of college students' psychological problems and find corresponding solutions. Secondly, this study found that in terms of gender, male college students are more likely to have more suicidal tendencies than female college students, which may be because males have relatively fewer emotional expression channels and are less likely to resolve negative psychological tendencies. This conclusion also aligns with the existing research and remains consistent.[36,37] In terms of age, as age increases, the suicidal tendencies of college students also increase, which is consistent with the conclusions of existing research.[38,39] College students, who are about to join the society, have less time to participate in work, and are relatively inexperienced in independent life, are under more significant pressure and are more likely to have harmful psychological problems. In terms of grades, as the grades increase, the suicidal tendencies of college students gradually decrease. It may be because, as the grades grow, they receive more life values through education, the more they appreciate the preciousness of life. Secondly, it may also be due to the grades. Younger college students are more impulsive and prone to suicidal tendencies. Regarding household registration, college students with rural household registration have higher suicidal tendencies scores, possibly due to the dual development of urban and rural areas in China. Students from rural household registration are more likely to feel the gap between urban and rural development, so the psychological impact on college students is larger and, thus, they are more prone to suicidal tendencies. Finally, the study also showed that college students with better sleep quality have lower suicidal tendencies scores. Research has shown that college students with lower sleep quality are more likely to have self-injurious behavior, and their sleep time is too short; insomnia or nightmares are significant predictors of it.[40] Therefore, relevant departments should pay more attention to the suicidal tendencies of college students and provide targeted psychological intervention and assistance to college students with different demographic characteristics. They can also increase courses on life values and fundamentally reduce the suicidal tendencies of college students.

Peer Bully Victimization is an Essential Factor Affecting the Suicidal Tendencies of College Students

We found that the bullying victim's three dimensions of verbal bullying, physical bullying, and social relationship bullying all have a positive and significant impact on the suicidal tendencies of college students. School bullying is a common phenomenon in primary and secondary schools in China, and it is also a severe problem that needs to be solved urgently. It seriously endangers the mental and physical health of young people. According to the relevant survey data of the "2014 Regional Education Quality Health Examination" project carried out by the China Basic Education Quality Monitoring Collaborative Innovation Center, the proportions of primary and middle school students who have suffered from physical bullying, verbal bullying, and relationship bullying are 30.85%, 58.28%, and 43.34%.[41] However, when these students who have suffered from campus bullying enter the university campus, the inferiority complex, perceived disadvantage, and relative deprivation brought about by long-term bullying will bring significant trauma to their physical and mental health[42] and trigger their suicidal tendencies. Generally speaking, the frequency of verbal bullying is the highest, followed by relational and physical bullying. After entering the campus, college students become more independent, and problems such as the pursuit of individuality and unconventional competitive psychology emerge in an endless stream of relational bullying.[43] Due to their relatively mature psychological state, college students face less physical bullying than elementary and middle school students. Therefore, on the one hand, it is necessary to educate college students on correct values, advocate a harmonious and friendly campus environment, and provide appropriate psychological intervention to college students who have experienced campus bullying. On the other hand, it is necessary

to strengthen the communication between teachers and students and resolve the contradictions among classmates through teacher-student dialogue to avoid adverse severe psychological problems for students.

Teacher Emotional Support is a Protective Factor Against Suicidal Tendencies of the Bully Victim

The results of this study show that teacher emotional support regulates college students' mental disorders and overall suicidal tendencies. According to the ecology theory, the school is the main micro-environment for the growth of students, and school teachers have an important influence on students' physical and mental health.[44] Teachers are students' leaders. At the same time, the authority of teachers can effectively help college students to establish correct values, attitudes towards life, and learning mentality. It can give corresponding emotional support when students have negative psychological states to alleviate the deepening of negative psychology.[45] Through benign teacher-student communication, students have a sense of trust in teachers, the close relationship between teachers and students is continuously deepened, and the interpersonal relationship is continuously strengthened, thus promoting young people's mental health. Students who suffer from peer bullying develop adverse psychological problems, and teachers play an essential protective role in this process. On the one hand, teachers can prevent secondary bullying by regulating the relationship between the bully and the bullied classmates. At the same time, teachers usually provide emotional comfort to communicate with the victimized classmates to help them resolve the psychological harm. On the other hand, before bullying occurs, teachers can also play an excellent preventive role. Through early investigation, teachers can understand students' potential in bullying or being bullied to prevent bullying.[46] Through the emotional help of teachers, college students can be relieved to a certain extent from the influence of bullying victims, thus reducing the probability of suicidal tendencies. Therefore, colleges and universities should pay attention to the role of teachers in dealing with students' psychology, establish a prevention mechanism system for college students' bad mental health, integrate teacher emotional support into college students' daily life in an institutionalized way, and aim at students with potential suicidal tendencies. There should be a corresponding identification mechanism so that teachers can provide emotional support in advance.

Family Support Has a Significant Moderating Effect on the Suicidal Tendencies of Bullying Victims and College Students

The results show that family support has a significant regulatory effect on bullying victims and college students' suicidal tendencies, and the regulatory effect of family support is significantly higher than that of teacher emotional support. The family is also a critical growth environment that affects the physical and mental health of students, and because the close relationship between family members and students is greater than that of school teachers, family members often have a more significant influence on students than school teachers. Family system theory believes that family members' concepts, thoughts, attitudes, and behaviors will influence each other. To ensure the healthy development of family members, the family will also perform its due functions.[47] Parents often play the absolute authority in the family, and how parents educate their children is extremely important to the latters' mental health. The current research has shown that parents' strict parenting style manifests essential family functions. Severe punishment by parents will have a profound negative impact on children's bodies and minds and ultimately increase adolescents' suicidal tendencies.[48] Nevertheless, on the other hand, support from family members can also effectively help alleviate the adverse psychological problems of college students. Related studies have shown that college students with higher levels of perceived family support have a lower risk of depression[49] and higher subjective well-being.[50] Active communication between college students and family members can improve their self-esteem, social skills, and ability to withstand stress. It can help college students build a better psychological defense line when encountering bullying and avoid emotional intensification to produce suicidal tendencies or behaviors.[51] Therefore, the family is the first line of defense for college students to build a healthy mentality. More material and emotional support from the family should be given to college students to help them relieve psychological pressure and mediate psychological problems. Schools and educational institutions should pay attention to the positive role of home-school communication, build strong defense measures

through school teachers and student's parents, preventively strengthen communication with students with adverse psychological problems, strengthen their mindful thinking, and prevent suicidal tendencies or the purpose of the behavior.

The aforementioned analysis reveals the importance of collaboration between families and schools in mitigating bullying victimization among university students. Firstly, nurturing and support within the family environment are paramount for shaping students' psychological well-being. Family members should prioritize establishing effective communication channels to promptly comprehend the mental states of students. Parents ought to actively engage in the lives of their children, attentively listening to their concerns and providing necessary support. Family education should also emphasize respect and inclusivity, facilitating the development of positive social behaviors in students. Simultaneously, schools play a pivotal role in the prevention and management of bullying issues. Schools should implement comprehensive anti-bullying policies, including explicit regulations and systems, to ensure students receive adequate protection within the campus. Education professionals need to undergo specialized training to better identify and address instances of bullying. Additionally, schools can reduce bullying occurrences by implementing mental health education, enhancing students' awareness of their own and others' psychological well-being. To achieve effective collaboration between families and schools, interdisciplinary teamwork is indispensable. Parents, educators, mental health professionals, and others should form a collaborative network, collectively focusing on the holistic development of students. Regular parent-school meetings and professional training activities can facilitate communication and understanding between both parties, thereby better addressing and preventing bullying issues. Through the close collaboration of families and schools, a more supportive and secure environment can be provided for university students, consequently reducing their experiences of bullying victimization and creating favorable conditions for mitigating suicidal ideation. This necessitates concerted efforts across society to ensure that every university student can mature within a healthy and positive atmosphere.

Limitations

Some limitations to this study warrant consideration. First, bullying victims, teacher emotional support, family support, and suicidal tendencies are cross-sectional in the study and can be further validated using longitudinal data in the future. Second, since the information was gathered from the participants in the study, self-report/recall bias may have existed. However, achieving continuous college student participation in cohort studies is not easy, and sample size should be addressed. In addition, future studies can also interact family support with teacher emotional support to analyze the impact of bullying victimization on college students' suicidal ideation in interactive situations.

Conclusions

Some Chinese college students are at risk of suicidal tendencies; peer bullying victimization is an important reason affecting the suicidal tendencies of college students; among them, verbal bullying, physical bullying, and social relationship bullying in bullying victims all have a positive and significant impact on the suicidal tendencies of college students; in addition, family support and teacher emotional support have a significant moderating effect on the victims of bullying and college students' suicidal tendencies, although the moderating effect of family support is significantly higher than that of teacher emotional support. Therefore, it is necessary to actively adopt home-school links and home-school communication to reduce campus violence and increase the psychological quality of college students.

Data Sharing Statement

The data sets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of Kangda College of Nanjing Medical University (2022-01) and all participants signed informed consent.

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