

The Association between Depression and Non-Suicidal Self-Injury among College Students

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Abstract: This study aimed to explore the relationship between non-suicidal self-injury (NSSI) behavior and depressive emotions among college students, offering crucial theoretical evidence for targeted enhancements in their mental well-being. Using a random cluster sampling method, on-site questionnaire surveys were conducted at Nanchang University and Jiangxi University of Traditional Chinese Medicine, involving 1095 college students from various academic years. The survey utilized the Center for Epidemiologic Studies Depression Scale (CES-D) and the Adolescent Non-Suicidal Self-Injury Assessment Questionnaire to evaluate depressive symptoms and NSSI behavior prevalence. The findings indicated a 22.9% NSSI behavior detection rate among 945 surveyed students, with a concurrent 28.57% detection rate of depressive emotions. Furthermore, it was noted that female students exhibited a higher NSSI detection rate than their male counterparts ($P < 0.001$). The study highlighted the complexity and universality of NSSI behavior among college students, with various influencing factors categorized into personal, social, familial, and adversarial life events. Additionally, a positive correlation was established between the total NSSI scores and the overall depression score, emphasizing the interconnection between NSSI behavior and depressive symptoms. Logistic regression analysis underscored a higher NSSI detection rate among female students, non-medical majors, introverted personalities, and individuals from families with strained parent-child relationships ($P < 0.01$). In conclusion, the study emphasized the need for increased focus on mental health guidance and education for college students, particularly among the Mongolian ethnic group.

1. Introduction

Non-suicidal self-injury (NSSI) refers to the deliberate, self-inflicted harm to one's own body without the intent to die and is not socially sanctioned [1]. Research has shown that the detection rate of NSSI behavior among Chinese adolescents is 22.37%. Similarly, NSSI behavior among college students in China also exhibits a high prevalence, showing an increasing trend over the years. Regional differences are significant, with the detection rate reaching 22% in the eastern regions, 23% in the central areas, and 2% in the western regions. College students possess specific

distinct characteristics. They belong to a group of adolescents living in a collective environment with a relatively high level of education and different personalities and aspirations [2].

In recent years, there has been an increasing occurrence of suicide incidents among university students, leading to a gradual rise in the suicide rate. Effectively preventing and intervening in suicidal behaviors among college students has become a pressing research focus in contemporary society. Several studies have demonstrated that although non-suicidal self-injury behavior in adolescents is not suicidal, the risk of suicide is significantly higher compared to that of ordinary students. Non-suicidal self-injury behavior is considered one of the most robust predictive risk factors for suicidal behaviors. Additionally, the detection rate of NSSI behavior among individuals with depression is around 50%. Currently, there is a shortage of research examining the association between depressive symptoms and NSSI among college students despite numerous reports highlighting the link between depressive symptoms and NSSI in adolescents.

In light of the context mentioned above, this study focuses on students from Nanchang University and Jiangxi University of Traditional Chinese Medicine, aiming to investigate the characteristics of depressive emotions and non-suicidal behavior among college students through surveys on current depressive feelings and NSSI behavior. Employing various statistical techniques, the study aims to comprehensively understand the relationship between depressive emotions and non-suicidal behavior and analyze the potential mechanisms underlying the association between depressive emotions and non-suicidal behavior. This research endeavors to play a pivotal role in effectively predicting and intervening in self-harm and suicidal behaviors among college students. It holds crucial theoretical and practical significance for establishing university students' mental and physical well-being and promoting campus stability and harmony.

2. Participants and Methods

2.1. Participants

A field questionnaire survey was conducted at Nanchang University and Jiangxi University of Traditional Chinese Medicine from January 2023 to September 2023. Using a random drawing method based on the division of majors and grades at both schools, ten classes were randomly selected from each institution. The selection process adhered to the principle of having a roughly equal number of students in each major and excluded individuals with major physical illnesses. A total of 1115 college students from 20 teaching classes participated in the study, with 1095 valid questionnaires collected, resulting in an effective response rate of 98.2%. Among the participants, there were 618 male students and 478 female students, with an average age range of 17 to 23 years.

2.2. Questionnaire

(1) Self-designed Questionnaire: This included general demographic information, such as date of birth, gender, grade, major, family background, and parental relationships. The personality type was assessed through self-evaluation, categorized into three types: introverted, ambivert, and extroverted.

(2) NSSI Behavior Assessment Scale: The Ottawa Self-Injury Inventory (OSI) was used, which consists of a series of independent scales assessing the intention and frequency of self-harm behavior, initial and sustained implementation of harm, motives, as well as addictive and other NSSI behavior characteristics. Foreign studies have demonstrated the scale's robust measurement efficacy, and an analysis of the Ottawa Self-Injury Function Scale assessing self-harm motives revealed five factors: internal emotional regulation, social influence, external emotional regulation, seeking stimulation, and addictive features. The scale has been translated into Chinese for use in

relevant research, with a Cronbach's alpha coefficient of 0.942.

(3) Center for Epidemiological Studies Depression Scale (CES-D): Developed by Radloff [3] in 1977, this self-assessment scale is one of the most commonly used tools for measuring levels of depressive symptoms, demonstrating good reliability and validity. It assesses symptoms such as depressed mood, feelings of guilt and worthlessness, helplessness and hopelessness, psychomotor retardation, poor concentration, decreased appetite, and sleep disorders. However, it does not include symptoms such as psychomotor agitation, increased appetite or sleep, or suicidal ideation [4-5]. The scale consists of 20 items, each scored from 1 to 4, with higher scores indicating more severe symptoms. Scores below 53 indicate no symptoms, 53 to 62 indicate mild symptoms, 63 to 72 indicate moderate symptoms and scores equal to or above 73 indicate severe symptoms. The Cronbach's alpha coefficient of the scale is 0.81 [6-7].

(4) Survey Procedure and Quality Control: To ensure the authenticity and validity of the survey data, survey personnel received professional training before the survey to understand the survey content, procedures, and precautions. A pre-survey was conducted to refine the survey questionnaire. Communication with class counselors and heads was carried out to coordinate and arrange students. The purpose and intent of the survey were explained to the students, emphasizing that participation was voluntary and anonymous and that the survey was solely for scientific research purposes. Students were reassured that the survey would be confidential, alleviating concerns. Students were instructed to complete the classroom questionnaire based on their circumstances independently. After completion, the surveyor collected and checked the questionnaires for missing information and logical errors [8-9].

2.3. Statistical Analysis

Data were entered using EpiData 3.02 and then organized and checked for any omissions using SPSS 10.0 software for statistical analysis. The comparison of detection rates of non-suicidal self-injury behavior and depression among college students was conducted using the χ^2 test. Univariate and ordered logistic regression models were employed to analyze the association between NSSI and the detection rate of depressive emotions and to examine the moderating effect of gender on the association between NSSI and depressive emotions. The significance level was set at $\alpha = 0.05$.

3. Results

3.1. Comparison of NSSI and Depression Detection Rates among College Students

The NSSI detection rate among college students was 22.92% (251), while the detection rate of depressive symptoms was 28.58% (313). Higher NSSI detection rates were observed among female students, non-medical majors, individuals with introverted personalities, and those experiencing discordant relationships with their parents, with all differences showing statistical significance (P all <0.01). Similarly, higher depression detection rates were noted among fourth-year students, those in non-medical majors, individuals with introverted personalities, and those experiencing discordant relationships with their parents, all exhibiting statistically significant differences (P all <0.01). Please refer to Table 1 below.

Among the 313 college students with depressive symptoms, the detection rate of NSSI behavior was 35.14% (110). In the group of 728 students without depression, 19.36% (141 individuals) exhibited NSSI issues, with the difference being statistically significant ($\chi^2 = 282.70$, $P < 0.01$).

Table 1: Detection Rates of NSSI and Depression among College Students

Group	Item	Count	Statistical Value	NSSI	Depression
Gender	Female	478		117(24.47)	140(29.33)
	Male	618		134(21.68)	173(27.99)
			χ^2	9.2	1.85
			<i>P</i>	<0.01	0.17
Grade	Freshman	719		167(23.22)	188(26.14)
	Sophomore	256		58(22.65)	82(32.03)
	Junior	104		22(21.15)	36(34.61)
	Senior	16		4(25.00)	7(43.75)
			χ^2	2.15	57.06
			<i>P</i>	0.54	<0.01
Major	Medical	590		110(18.64)	148(25.08)
	Non-medical	505		141(27.92)	168(33.26)
			χ^2	100.14	58.45
			<i>P</i>	<0.01	<0.01
Only Child	Yes	399		93(23.30)	110(27.56)
	No	696		158(22.70)	203(29.16)
			χ^2	0.34	1.52
			<i>P</i>	0.56	0.22
Personality Type	Introverted	318		90(28.30)	114(35.84)
	Ambivert	433		93(21.47)	120(27.71)
	Extroverted	344		68(19.76)	79(22.96)
				χ^2	60.71
			<i>P</i>	<0.01	<0.01
Parental Relationship	Discordant	14		5(35.71)	8(57.14)
	Normal	119		38(31.93)	50(42.01)
	Harmonious	962		208(21.62)	255(26.50)
			χ^2	53.05	136.3
			<i>P</i>	<0.01	<0.01

Note: Numbers in parentheses represent detection rates in percentage (%).

3.2. Methods and Types of NSSI among College Students

3.2.1. Gender Differences in the Implementation of NSSI Among College Students

The results in Table 2 indicate that regarding the methods of self-harm, college students predominantly employed "biting oneself forcefully" (52.5%), "picking or scratching oneself" (52.5%), "pulling one's hair forcefully" (42.2%), and "banging one's head against the wall" (29.0%). Gender differences were observed, with females exhibiting a higher prevalence of "biting oneself forcefully" and males showing a higher prevalence of "pulling one's hair forcefully," "burning oneself with cigarettes/fire or hot water," "immersing/burying the head in water to suffocate oneself," "excessive or indiscriminate use of drugs (not for treatment)," and "swallowing or drinking inedible substances," all of which were statistically significant ($P < 0.05$).

Table 2: Implementation Methods of NSSI and Gender Differences among College Students

NSSI Type	Male		Female		Total	Male	X ²	p
	Count	%	Count	%	Count	%		
Banging head against the wall								
Yes	38	32.5	35	26.2	73	29	2.021	0.155
No	79	67.5	99	73.8	178	71		
Biting oneself forcefully								
Yes	54	46.1	78	58.3	132	52.5	6.144	0.013
No	63	53.9	56	41.7	119	47.5		
Picking or scratching oneself								
Yes	61	52.7	71	53	132	52.5	0.06	0.806
No	56	47.3	63	47	119	47.5		
Pulling one's hair forcefully								
Yes	57	48.7	49	36.6	106	42.2	6.344	0.012
No	60	51.3	85	63.4	145	57.8		
Cutting or stabbing oneself with a knife or sharp object								
Yes	20	17.5	16	11.5	36	14.2	1.806	0.179
No	97	82.5	118	88.5	215	85.8		
Burning oneself with cigarettes/fire or hot water								
Yes	21	11.8	11	5.1	32	8.1	5.812	0.016
No	157	88.2	204	94.9	361	91.9		
Immersing/burying the head in water to suffocate oneself								
Yes	22	18.8	5	3.8	27	10.7	7.889	0.005
No	95	81.2	129	96.2	224	89.3		
Binding oneself with a rope								
Yes	13	11.2	7	5.3	20	7.9	3.409	0.065
No	104	88.8	127	94.7	231	92.1		
Excessive or indiscriminate use of drugs (not for treatment)								
Yes	16	13.7	7	5.3	23	9.1	8.403	0.004
No	101	86.3	127	94.7	228	90.9		
Swallowing or drinking inedible substances								
Yes	18	15.4	8	6	26	10.3	8.863	0.003
No	99	84.6	126	94	225	89.7		

3.2.2. Types of NSSI Implementation and Gender Differences among College Students

The results in Table 3 indicate that the proportions of college students engaging in one, two, or three or more types of NSSI within the past year were 44.5%, 24.4%, and 31.0%, respectively, with no statistically significant difference ($P = 0.103$).

Table 3: Types of NSSI Implementation and Gender Differences among College Students

Types of NSSI	Male		Female		Total		X ²	P
	Count	%	Count	%	Count	%		
1	48	41	63	47.4	111	44.2	4.554	0.103
2	26	22.3	34	26	60	23.9		
≥3	43	36.7	37	26.5	80	31.8		

3.3. Correlation between NSSI Behavior and Depression among College Students

The correlation analysis revealed that the total NSSI score among college students, as well as higher-lethality self-harm behaviors, physical tissue damage self-harm behaviors, self-harm

behaviors with no apparent visible signs, potential self-harm behaviors, and psychological harm behaviors, were all positively correlated with the total depression score (r values were 0.26, 0.13, 0.16, 0.19, 0.18, and 0.27, respectively; P all <0.01).

3.4. Logistic Regression Analysis of the Impact Factors of Depression and NSSI Behavior among College Students

In the logistic regression analysis, with NSSI (No= 0, Yes = 1) as the dependent variable, and with gender (female = 1, male = 2), major (medical = 1, non-medical = 2), personality type (introverted = 1, ambivert = 2, extroverted = 3), and relationship with parents (discordant = 1, normal = 2, harmonious = 3) with depression (both absent = 1, present = 2) as the independent variables, the results showed that, with other relevant factors controlled, depression (OR values were 1.47) was positively correlated with the occurrence of NSSI (P all <0.01). Please refer to Table 4.

Table 4: Logistic Regression Analysis of the Impact of Depression on NSSI among College Students (n = 1095)

Item	Option	β	S'ESE	Wald χ^2	P	OR (95%CI)
Constant		-1.19	0.2	32.52	<0.01	0.3
Gender	Male					1.00
	Female	-0.16	0.05	8.51	<0.01	0.85 (0.77 ~ 0.96)
Major	Medical					1.00
	Non-medical	0.42	0.05	66.25	<0.01	1.50 (1.35 ~ 1.67)
Personality Type	Introverted					1.00
	Ambivert	-0.29	0.06	22.15	<0.01	0.75 (0.66 ~ 0.86)
	Extroverted	-0.28	0.06	21.56	<0.01	0.74 (0.64 ~ 0.86)
Parental Relationship	Discordant					1.00
	Normal	0.04	0.22	0.04	0.84	1.03 (0.67 ~ 1.61)
	Harmonious	-0.28	0.22	1.78	0.17	0.75 (0.49 ~ 1.15)
Depression	No					1.00
	Yes	0.38	0.06	47.25	<0.01	1.47 (1.31 ~ 1.67)
Constant		-1.19	0.2	32.52	<0.01	0.3

4. Discussion

The results of this study indicate an overall detection rate of non-suicidal self-injury (NSSI) among college students of 22.92%, with a higher rate among females (24.47%) compared to males (23.1%). This aligns with previous research findings. Factors of gender inequality may mediate gender differences in NSSI, as females are more likely than males to be influenced by academic goals, friendship loyalty, and interpersonal relationships, leading to higher levels of distress and suffering [10]. Concerning age, prominent, personality, and family relationships, non-medical majors, introverted personalities, and students from families with discordant relationships exhibited higher favorable detection rates of NSSI and depression. This might be attributed to the fact that introverted students often tend to internalize their confusion and psychological issues, avoiding seeking help from others, leading to severe emotional problems and potentially triggering NSSI behaviors [11]. Medical major students, influenced by their knowledge in their field, tend to prioritize their health and psychological regulation capabilities. They are better equipped to handle problems rationally and face conflicts or setbacks, resulting in a lower detection rate of various adverse issues, consistent with the findings of this study [12]. The family environment is crucial for

young adults' physical and mental health development. A positive family environment signifies harmonious relationships between parents and children, where parents can provide timely attention and education when children encounter problems. Conversely, discordant family environments often lead to adverse psychological issues and the occurrence of NSSI behavior [13].

In terms of the methods used by college students in NSSI, "biting oneself with force," "picking or scratching oneself," "pulling one's hair with force," and "hitting the head against the wall" were more common. Among these, "biting oneself with force" was more prevalent among females, while "pulling one's hair with force," "burning oneself with cigarettes/hot water," "immersing/burying the head in water to suffocate oneself," "excessive or indiscriminate use of drugs," and "swallowing or drinking inedible substances" were more prevalent among males. The significant gender differences in NSSI methods help explain why the detection rate is higher in females than males. The most common NSSI methods used by females were relatively explicit, such as "biting oneself with force" and "cutting one's skin," while males tended to choose more impactful and relatively concealed methods, such as "hitting the head or hand against the wall" and "burning oneself with cigarettes." These differences may explain why NSSI is more common in females than males. Additionally, due to social and cultural factors, males are less likely to report NSSI behavior, as society often expects males to endure stress, setbacks, failures, etc. Thus, when facing pain and difficulties, males are more inclined to choose less noticeable relief methods to avoid detection, highlighting the need for greater attention to male self-harm behavior [14].

Among college students who engaged in NSSI in the past year, the proportions using one, two, three, or more NSSI methods were 44.5%, 24.4%, and 31.0%, respectively. College students tend to adopt multiple methods and repeatedly harm themselves, indicating the recurrent nature of self-harm behavior. The use of different methods is likely a combination of unique biological, physiological, and psychological characteristics that lead some college students to rely on NSSI as a coping mechanism [15].

The results of the logistic regression analysis demonstrate a positive correlation between depressive symptoms and NSSI behavior among college students. The occurrence of depression is a risk factor for the event of NSSI. Research by Kaur [16] has shown that individuals with depression are often reluctant to communicate and interact with others, exacerbating their depression as they struggle to find ways to alleviate and resolve their issues, leading to more severe problems such as NSSI or even suicide. Studies by Boone [17] have also confirmed that the severity of depression directly influences the occurrence of NSSI behavior, showing a positive correlation, which is consistent with the findings of this study [18]. This indicates that early attention and guidance should be given to college students to alleviate psychological stress and confusion to prevent the occurrence of NSSI, which may lead to more severe harm and even suicidal behavior. Although this study analyzed the association between NSSI and depressive symptoms, being a cross-sectional survey, it cannot reveal the causal relationship between NSSI and depression. Therefore, future research should focus on exploring the variable factors that contribute to the co-occurrence of depressive symptoms and NSSI, including potential gender differences, to further delve into effective paths to alleviate depressive symptoms and NSSI. Additionally, this study was conducted only in two universities in Jiangxi Province, limiting the sample's representativeness. Future research should expand the investigation's scope to enhance the results' external validity.

5. Conclusion

College students are facing severe challenges in the prevention and control of NSSI and depression, with depression being a risk factor for the occurrence of NSSI. It is recommended to actively prevent the occurrence of depression and NSSI, strengthen psychological health education among college students, cultivate positive personalities, effective coping mechanisms, and adaptive solid abilities, and improve psychological resilience. Enhancing family and school environments while reducing potential influencing factors from both the family and school is essential. For

college students at risk of depression and NSSI, schools should establish a systematic screening system for high-risk groups in a timely and professional manner and provide corresponding training for staff and parents. Schools should conduct various cultural activities to increase student communication and interaction, identify students with abnormal psychological issues, and provide timely follow-up and support. For college students who have engaged in NSSI, it is essential to understand the reasons behind their NSSI, assess the risk of recurrence, and actively provide appropriate intervention measures. Exercise is the healthiest and most economical way to alleviate psychological stress. Therefore, colleges should create a more exercise-friendly atmosphere and promote various sports activities to help students maintain good psychological well-being and promote their academic and psychological development.

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