



Aggression and Non-Suicidal Self-Injury among Depressed Youths: The Mediating Effect of Resilience

*Ling ZHANG¹, Meiai CHEN², Benxian YAO³, Ying ZHANG¹

1. Center for Mental Health, Shaoxing University, Shaoxing, China
2. School of Tourism and Health, Zhejiang A & F University, Hangzhou, China
3. College of Teacher Education, Hefei Normal University, Hefei, China

*Corresponding Author: Email: zhangling@usx.edu.cn

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Abstract

Background: The global spread of COVID-19 not only exerted an enormous impact on the public in different countries but also aggravated depression among youths. The aggressive tendencies of depressed individuals can harm their body and life and threaten those of others. The aggressive and non-suicidal self-injurious behaviors of depressed youths may seriously affect their physical and psychological health if not identified and mediated promptly.

Method: A total of 875 young respondents (including college students, community youths, migrant workers, and so on) from three provinces in China were surveyed in 2020 using a depression scale, non-suicidal self-injury scale, aggression scale, and resilience scale.

Results: Depression, non-suicidal self-injury, and aggression are significantly higher among the members of the depression group compared with the members of the healthy control group ($P < 0.001$), and the resilience of the members of the former group is remarkably lower than that of the members of the latter group ($P < 0.001$). Aggression among the depressed youths exhibits a significant positive correlation with non-suicidal self-injury ($r = 0.43$, $P < 0.01$), whereas aggression ($r = -0.18$, $P < 0.05$) and non-suicidal self-injury ($r = -0.20$, $P < 0.05$) demonstrates significant negative correlations with resilience. The resilience of the youths in the depression group plays a partial mediating role in the relationship between aggression and non-suicidal self-injury.

Conclusion: The more aggressive the behaviors of the depressed youths, the more serious their non-suicidal self-injurious symptoms. Furthermore, resilience plays a partial mediating role in the relationship between aggression and non-suicidal self-injury.

Keywords: Youth; Aggression; Non-suicidal self-injury; Resilience

Introduction

Depression is the primary cause of disability among youths and the rise in suicide rates globally (1). From 2008 to 2018, the morbidity of depression increased by approximately 20% worldwide and exhibited a yearly rising trend (2, 3).

The continuous presence of COVID-19 heightened depression among young people. In addition, depressed individuals typically show multiple aggressive forms pointing inward and outward, such as self-injury, suicide, impulsion, and



agitation, which can harm not only their body and life but also those of others (4). People with non-suicidal self-injurious tendencies are also susceptible to different types of emotional disorders, including depression and anxiety (5). Depressive symptoms can be used to predict non-suicidal self-injurious behaviors (6). Moreover, depression may be highly correlated and interact with non-suicidal self-injury.

Aggression is any form of behavior to hurt individuals who want to evade such behaviors and others deliberately, and an aggressor believes that his/her behavior will hurt his/her opponent, who has a motivation to avoid such behaviors (7). Importantly, evidence shows that the most common type of aggression found in populations with psychosis is reactive aggression. Reactive aggression refers to behaving aggressively in reaction to a perceived provocation or threat, in contrast to proactive aggression, which is behaving aggressively to achieve a particular goal. Depressive symptoms among youths are closely related to behavioral problems. Youths implicated in depression may have many behavioral repertoire deficits, such as maladjustment characteristics and attitudes as well as deficit in adjustment characteristics (for instance, self-esteem and resilience) (8).

Aggression is positively correlated with depression. Moreover, those who reported more sadness dysregulation had elevated depressive and social anxiety symptoms, whereas those who reported more anger dysregulation had elevated aggressive behavior. (9). Males with depression will likely engage in serious and diversified criminal behaviors (10). Non-suicidal self-injury is an intentional, self-imposed damage of body tissue resulting in instant injury without the intention to commit suicide. This intentional and self-imposed damage is also called self-injurious behavior. Non-suicidal self-injury is referred to as self-mutilation, self-harm, or self-abuse, which occurs when someone purposefully and frequently harms herself/himself in a manner that is impulsive and is not intended to be fatal. Most young mentally ill individuals exhibit non-suicidal self-injurious and aggressive behaviors (11).

Compared to non-suicidal self-injuring controls, those who engaged in direct non-suicidal self-injury or indirect forms of non-suicidal self-injury were more impulsive, experienced more problems with negative emotions (negative temperament, depression), had more problems with aggression, tended to be more under-controlled in their behavior (disinhibition) and had lower self-esteem. Aggression is regarded as a potential phenotype manifesting non-suicidal self-injurious and suicidal behaviors. How aggression among depressed youths influences non-suicidal self-injury has yet to be investigated. Based on theoretical analysis and field observation, the following hypothesis was established: aggression among depressed youths can be used to predict their non-suicidal self-injurious behaviors.

Resilience is a psychological trait representing an individual's ability to adapt and positively respond to difficulties or adversity. Indeed, resilience is considered both a protective factor and not, related to positive or negative psychological outcomes (12). Resilience, together with coping strategies, may help individuals in facing adversity. The individual ability to face personal or environmental difficulties, while maintaining positive outcomes, constitutes the risk-and-resilience perspective. Resilience also indicates an individual's ability to maintain satisfactory physical and mental states in negative environments and adapt to his/her surrounding environment and avoid or overcome adverse outcomes generated by pressure from school or work, such as aggressive behavior, depression, and post-traumatic stress disorder. On this basis, this research posits that resilience may play a mediating role between aggression and non-suicidal self-injury. On the one hand, repression of the resilience of depressed youths may influence their non-suicidal self-injurious behaviors. High resilience among youths can alleviate mental stress and negative effects and improve their quality of life and subjective wellbeing (13). When encountering violence, individuals with high resilience can protect themselves from mental impairment, but those with low resilience may exhibit problematic, even suicidal, behaviors. The following hypothesis was

established: resilience plays a mediating role between aggression and non-suicidal self-injurious behaviors.

Methods

Research tools

Patient health scale (nine items; PHQ-9): the PHQ-9 was compiled based on the depression criteria in the 5th edition of *Diagnostic and Statistical Manual of Mental Disorders* published by the American Psychiatric Association, including nine symptom items, and used to backtrack the situation of respondents from the past two weeks (14). Each item is divided into four levels (0 to 3 scores), with scores < 5 representing no depression, scores 5 to 9 indicating mild depression, scores 10 to 14 expressing obvious depression, and scores ≥ 15 denoting severe depression. Each respondent's degree of depression was judged based on his/her total score, and the higher the total score, the more severe the depression. The Cronbach's α coefficient of this questionnaire was 0.88.

Non-suicidal self-injury scale: this scale, containing 12 items, was compiled by Wan et al (15), and employs a five-point Likert scale; the higher the score, the higher the self-injury frequency. The Cronbach's α coefficient of this questionnaire was 0.95.

Aggression scale: this scale, containing 14 items, was compiled by Buss et al and revised by Li et al (16). This scale also uses a five-point Likert scale and the higher the score, the higher the level of aggression. The Cronbach's α coefficient of this scale was 0.84.

Brief resilience scale: this scale, containing six items (three positive and three negative scoring items) and employing a five-point Likert scale, was compiled by Smith et al (17). The scale's Cronbach's α coefficient was 0.71.

Data collection

College students, community youths, migrant workers, and so on in Zhejiang, Anhui, and Hu-

bei, China, were examined with an online questionnaire survey through hierarchical cluster random sampling from October to November 2020. A total of 900 questionnaires were distributed, and 875 valid questionnaires were recovered, with an effective recovery rate of 97.2%. The respondents included 215 males (24.6%) and 660 females (75.4%). Among the respondents, 407 were 19 years old or below (46.5%), 386 were between the ages of 20 and 29 years (44.1%), 66 were between the ages of 30 and 39 years (7.5%), and 16 were between the ages of 40 and 44 years (1.8%).

The study was approved by the university and informed consent was taken from all participants before the study.

The collected data were analyzed and processed with SPSS 21.0 (Chicago, IL, USA). The evaluation results of the respondents for depression, non-suicidal self-injury, aggression, and resilience were analyzed, and the relationship between aggression and non-suicidal self-injury and resilience among the youth respondents was explored via a *t* test, correlation analysis, multiple regression analysis, and so on.

Results

Common method variance

All the tested variables were included in the exploratory factor analysis using the Harman single-factor test method. Seven factors with a latent root greater than 1 were obtained without rotation, in which the variation explained by the first factor was 30.82%, which is lower than the critical standard of 40%. Thus, no common method variance existed in the research data.

Conditions of youth depression group and healthy control group

A total of 875 young individuals were included in the baseline survey, 247 of whom reported depressive tendencies, and the detection rate was 28.20%.

Table 1: Comparison of scale scores between youth depression group and healthy control group

<i>Variable</i>	<i>Healthy control group (n=628)</i>	<i>Depression group (n=247)</i>	<i>t</i>	<i>P</i>
Gender	1.72 ± 0.45	1.77 ± 0.42	-1.275	0.203
Age (yr)	1.70 ± 0.79	1.63 ± 0.66	1.313	0.190
Depression	2.26 ± 1.49	8.94 ± 3.81	-26.751***	0.000
Non-suicidal self-injury	0.13 ± 0.52	1.34 ± 4.51	-4.210***	0.000
Aggression	22.77 ± 5.99	28.28 ± 8.25	-9.543***	0.000
Resilience	21.94 ± 3.47	18.71 ± 3.58	12.094***	0.000

* $P < 0.05$, ** $P < 0.01$, and *** $P < 0.001$

Table 1 shows that the depression group differed significantly from the healthy control group in its total score in the depression scale, non-suicidal self-injury scale, aggression scale, and resilience scale. Depression, non-suicidal self-injury, and aggression were significantly higher in the depression group than in the control group ($P < 0.001$), and the former group's resilience was remarkably lower than that of the control group ($P < 0.001$). In addition, no significant difference

was observed among the members of both groups in terms of gender or age.

Correlation analysis of depression, non-suicidal self-injury, and aggression with resilience among the young respondents

Table 2 shows the results and calculations of the general conditions of respondents according to the scores in the depression scale, non-suicidal self-injury scale, aggression scale, and resilience scale.

Table 2: Relation between depression, non-suicidal self-injury, aggression, and resilience among young respondents

<i>Variable</i>	<i>Depression</i>	<i>Non-suicidal self-injury</i>	<i>Aggression</i>	<i>Resilience</i>
Depression	-	0.46**	0.32**	-0.35*
Non-suicidal self-injury	0.19**	-	0.43**	-0.20*
Aggression	0.21**	0.12	-	-0.18*
Resilience	-0.14*	-0.13*	-0.07	-

Note: The relative coefficient of all the variables in the depression group is presented above the diagonal, and the relative coefficient of all the variables in the healthy control group is presented below the diagonal.

* $P < 0.05$ and ** $P < 0.01$

The results of the Pearson correlation analysis indicated that in the depression group, every two total scores in the depression scale, non-suicidal self-injury scale, and aggression scale were positively correlated ($P < 0.01$), with correlation coefficients of 0.46, 0.32, and 0.43, and each was negatively correlated with the total score in the resilience scale ($P < 0.05$), and correlation coefficients of -0.35, -0.20, and -0.18. In the healthy control group, the total score in the depression scale demonstrated a significant positive correlation with the total score in the non-suicidal self-injury scale and aggression scale and a significant nega-

tive correlation with the total score in the resilience scale. However, the correlation between aggression and non-suicidal self-injury and resilience was not significant, and the correlation coefficients in the healthy control group were lower than those in the depression group. The concrete correlation analysis results are presented in Table 2.

Mediating role of resilience between aggression and non-suicidal self-injury

According to the correlation analysis of non-suicidal self-injury and aggression with resilience

in the depression group, non-suicidal self-injury showed a significant positive correlation with aggression ($P<0.01$). Moreover, a significant negative correlation was observed between non-suicidal self-injury, aggression, and resilience ($P<0.05$), which provided the possibility for testing the mediating effect of resilience. Therefore, the mediating role of resilience between aggression and non-suicidal self-injury was probed via regression analysis to determine the relationship between the variables. The ordinary least squares method was used to perform multiple regression analysis, taking aggression as the independent variable and resilience and non-suicidal self-injury as the dependent variables.

The multiple regression analysis results are displayed in Table 3. Aggression among the depressed youths exerted a significant positive predicting effect on non-suicidal self-injury ($\beta=0.426$, $P<0.001$) and a significant negative predicting effect on resilience ($\beta=-0.170$, $P<0.001$). When resilience was added, aggression

($\beta=0.405$, $P<0.001$) with resilience ($\beta=-0.127$, $P<0.01$) exerted a significant negative predicting effect on non-suicidal self-injury. Resilience mediated the relationship between aggressive behaviors and non-suicidal self-injury among the depressed youths. Specifically, their aggressive behaviors influenced non-suicidal self-injury via the mediating variable, namely, resilience. The regression coefficient ($\beta=0.405$, $P<0.001$) of aggressive behaviors showed that resilience played a partial mediating role between aggressive behaviors and non-suicidal self-injury among the young individuals in the depression group. Moreover, the ratio of the mediating effect to the overall effect was 5.07%, that is, the mediating effect value of resilience was 0.05. Table 4 illustrates that in the control group, aggression did not exert a significant direct predicting effect on non-suicidal self-injury or resilience. Given the regression coefficient of aggression ($\beta=0.112$, $P>0.05$), resilience did not exert a mediating effect between aggressive behaviors and non-suicidal self-injury.

Table 3: Depression group: Mediating effect of resilience in the relationship between aggression and non-suicidal self-injury

Steps	Dependent variables	Independent variables	R ²	Adjusted R ²	F-value	β	t
1	Non-suicidal self-injury	Aggression	0.182	0.180	138.883***	0.426	11.785***
2	Resilience	Aggression	0.029	0.027	18.605***	-0.170	-4.313***
3	Non-suicidal self-injury	Aggression				0.405	11.125***
		Resilience	0.197	0.195	11.634***	-0.127	-3.484**

* $P<0.05$, ** $P<0.01$, and *** $P<0.001$

Table 4: Healthy control group: Mediating effect of resilience in the relationship between aggression and non-suicidal self-injury

Steps	Dependent variables	Independent variable	R ²	Adjusted R ²	F-value	β	t
1	Non-suicidal self-injury	Aggression	0.036	0.032	9.025**	0.188	3.004
2	Resilience	Aggression	0.005	0.001	1.275	-0.072	-1.129
3	Non-suicidal self-injury	Aggression				0.112	1.775
		Resilience	0.029	0.021	11.634***	-0.121	-1.913

* $P<0.05$, ** $P<0.01$, and *** $P<0.001$

Discussion

A total of 875 youths were included in the baseline survey, 247 of whom reported depressive tendencies, and the detection rate was 28.20%, which is slightly higher than that in previous studies (18). The continuous development of COVID-19 from January 2020 to the present exerts a substantial impact on schools and society and aggravates depression and anxiety among the public. During a pandemic, the resilience of quarantined individuals is reduced substantially (19), and patients infected with COVID-19 are highly prone to depression and mental illnesses (20). From the overall analysis of aggression, non-suicidal self-injury, and resilience among the depressed youth respondents in Table 1, non-suicidal self-injury, aggression, and depressive tendencies among the youth individuals in the depression and healthy control groups showed no significant differences in terms of gender and age, thereby indicating that non-suicidal self-injury, aggression, and depressive tendencies were common among the members of the two youth groups, which is consistent with the results of existing studies.

Depression, non-suicidal self-injury, and aggression among the youths in the depression group were significantly higher than those among the youths in the healthy control group. Moreover, resilience in the former group was apparently lower than that in the latter group, thereby indicating that the resilience of the depressed youths was reduced, which also coincides with the findings of previous studies (21). In other words, the occurrence rate of health-risk behaviors in depressed young people was higher than that among the even-aged general community. Hence, the depressed youths were highly susceptible to risks, harm from their living environment, and thus resorted to non-suicidal self-injury. Meanwhile, the total aggression score of the depressed youths was significantly higher than that of the healthy youths. Thus, the depressive emotions of the depressed youths can be ascribed to the phe-

nomenon that the less their concern about school, family, and society, the more their involvement with conflict, which is mainly manifested by aggressive behaviors. The total resilience score of the depressed youths was significantly lower than that of the healthy youths, thereby indicating that the depressed youths had weaker mental self-regulation abilities than the healthy youths (22).

The correlation analysis results in Table 2 show that in the depression group, non-suicidal self-injury and aggression demonstrated a significant positive correlation with depression but a significant negative correlation with resilience. In the healthy control group, no significant correlations were found between aggressive behaviors, non-suicidal self-injury, and resilience, and all the correlation coefficients were lower than those in the depression group were. These results illustrated that aggression and non-suicidal self-injury were the main manifestations of depression, and resilience was a potential influencing mechanism (23). According to dissonance theory, the aggressive and antisocial behaviors of youths are caused by an abnormal loop in their central nervous system to regulate negative emotions and process environmental cues, thereby weakening their emotion regulation and control and ability to control emotional expressions effectively, which may trigger or maintain pathological symptoms and further prove the influence of aggression on non-suicidal self-injurious behaviors. Therefore, the higher the frequency of non-suicidal self-injurious and aggressive behaviors, the more severe the depressive tendencies, which further confirm the results of existing study (24).

The analysis results in Tables 3 and 4 demonstrate that the resilience of the depressed young individuals not only directly exerted a significant influence on aggression but also played a partial mediating role between aggressive behaviors and non-suicidal self-injury, similar to another study (25). In the healthy control group, resilience did not exert a mediating effect on the relationship between aggressive behaviors and non-suicidal self-injury, thereby indicating that resilience

played a mediating role between aggressive behaviors and non-suicidal self-injury only under individual depression states. The theoretical resilience model of individual–process–environment reveals that human, environmental, and adaptation results interact with and influence one another. When an individual encounters pressure or challenges, the individual and environment will engage in an interaction process, and internal resilience factors (including cognition, emotions, the spirit, the body, and behaviors) will function and help the individual cope successfully or adapt to adversity (26). This finding facilitates theoretical understanding on the path of aggression in influencing non-suicidal self-injury among depressed youths and emphasizes that resilience plays a mediating role between aggression and non-suicidal self-injury.

The following intervention insights can be obtained from the results of the abovementioned analyses. First, depressive symptoms have a significant positive effect on non-suicidal self-injurious behaviors and aggression. Thus, educators, the government, and enterprises should attach considerable importance to mental health screening among youths, especially depressive symptom screening, to enhance their emotion management abilities. Severely depressed youths should be transferred to professional medical institutions for treatment to avoid critical incidents. Second, the non-suicidal self-injurious and aggressive behaviors of depressed youths should be addressed, and cognitive appraisal methods should be adjusted. Such adjustments include reducing cognitive appraisals of harmful non-suicidal self-injurious and aggressive behaviors or modifying cognitive reappraisals, such as establishing cognitive appraisals that are moderately beneficial to mental health with respect to non-suicidal self-injurious and aggressive behaviors. For instance, positive peer relationships among young people should be supported to enhance the importance of other adaptation results (27). Resilience and potential can be encouraged and cultivated through certain methods (28). Therefore, the non-suicidal self-injurious and aggressive behaviors of depressed youths should be

mediated and treated in a timely manner, and their resilience should be cultivated to reduce the occurrence rate of depression (29).

The development of resilience is a dynamic cyclic process. Under the influence of individual and environmental factors, families, schools, and societies should adopt pertinent caring measures for youths during different phases to promote the formation and development of resilience (30), which can be enhanced continuously through individual, or occupational experiences and related education. In their education and employment, youths should be cared for and supported holistically to repress non-suicidal self-injurious and aggressive behaviors. During this process, special concern and care should be provided by families, schools, and societies to depressed youths. Youths who encounter problems should be treated in a timely manner. Moreover, youths should be encouraged to seek professional assistance for mental or spiritual problems proactively.

Conclusion

Depression, non-suicidal self-injury, and aggression among the depressed youths were significantly higher than those among the healthy youths were. Moreover, the resilience of the former individuals was substantially lower than that of the latter individuals. Non-suicidal self-injury and aggression among the depressed youths were positively correlated with depression at significant levels and negatively correlated with resilience at significant levels. Finally, the resilience of the depressed youths played a partial mediating role between aggression and non-suicidal self-injury.

Ethical considerations

Ethical issues (including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, and so on) were closely monitored by the authors.

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Conflict of interest

The authors declare that there is no conflict of interest.

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