

Adolescent Post-traumatic Stress Disorder as a Mediator Between Childhood Negative Life Event Types and Depression

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Abstract. The aim of the current research was to understand how subtypes of childhood negative life events (NLEs) contribute to adolescent post-traumatic stress disorder (PTSD) symptoms and depression, as well as the mediating effects of PTSD symptoms in the relationship of stress of NLEs and depression. The sample included 447 Chinese young people from 12 to 24. The participants were asked to report subtypes of their experienced childhood NLEs as well as past and current stress intensity of the NLEs. Then their current PTSD and depression symptoms were measured. Results found that among the past stress of NLEs, such as family violence or abuse had a significant impact on depression symptoms. Among the current stress of NLEs, such as death of family member or friend and serious illness or injuries had significant impacts on depression. Moreover, PTSD symptoms had partial mediating effect in the relationship between the past stress of NLEs and adolescent depression, and full mediating effect in the relationship between the current stress of NLEs and adolescent depression. These results suggested that the impacts of childhood NLEs on adolescent PTSD and depression are multi-dimensional. Future intervention of adolescent PTSD and depression should take the exposure experiences of specific types of NLEs into consideration.

Keywords: Childhood trauma; negative life events; Adolescent; Post-traumatic stress disorder; Depression.

1. Introduction

1.1 Backgrounds

The major depressive disorder (MDD) is one of the most serious mental health problems among Chinese adolescents. Research showed that 24.6% of Chinese adolescents had been diagnosed with depression [1]. Previous studies found adolescent depression is related to childhood negative life events (NLEs). NLEs, which are similar to traumas, are events that contain risks of death, injury, and violation [2, 3]. These challenges are specifically salient in adolescents, who are experiencing the highest rates of adversities [4]. Furthermore, because of the developmental neurobiological, emotional, and social functional reasons, adolescents are more likely to be vulnerable to the impacts of stressors [5].

As a result, this study aims to find the effects of different subtypes of childhood NLEs on adolescent depression, and if the posttraumatic stress disorder (PTSD) associated with childhood NLEs can mediate the correlation between childhood NLEs and adolescent depression.

1.1.1 Relationship between childhood NLEs and adolescent depression

It is well-known that there is a relationship between NLEs and increased adolescent depression. A meta-analysis showed adolescents with childhood NLEs are tend to suffer from MDD [6].

As a biological result of childhood trauma, they also suggested a separable subtype of depression, which may response differently to treatments. Researchers also found that different childhood NLEs are associated with distinct disorders in HPA-axis functioning [7]. Studies also suggested that childhood NLEs are more sensitive to acute independent life events [8]. In addition, childhood NLEs were found to be related to maladaptive emotional regulation, enhanced avoidance, emotional pressure, and expression of pessimistic information in young people [9, 10]. These outcomes are also similar to features of depression.

However, other variables should also be taken into consideration in the relationship of childhood NLEs and adolescent depression, such as subtypes of NLEs, and PTSD symptoms associated with the NLEs.

1.1.2 Relationship between different types of childhood NLEs and depression

In previous studies, childhood NLEs were divided into different types, which contribute differently to adolescent depression. A systematic review suggested that emotional maltreatment, neglect, sexual abuse and physical abuse were significantly related to clinical depression [11]. Other researchers used categorized childhood NLEs into five subtypes and suggested that adolescents with high betrayal trauma physical abuse and emotional abuse and parent death were more likely to develop moderate to severe depression than those with low betrayal trauma, high betrayal trauma sexual and emotional maltreatment and low trauma profile [12].

Among young participants aged 8-17, Multivariate analysis suggested that all childhood NLE measures were related to significantly severer symptoms of depression. Children who experienced four or more NLEs had higher risks of depression than children who experienced less than four NLEs. Children who exposed to family separation, economic problem, witness of domestic violence or household dysfunction also had higher risk to develop depression symptoms than their peers without exposure [13]. In China, researchers indicated that the correlation between individual childhood NLEs, including beating, neglect, abuse, and early-adult clinical depression was significant [14, 15].

1.1.3 PTSD as a mediator in the relationship between children NLEs and adolescent depression

In addition to depression, childhood NLEs also contribute to adolescent PTSD. Young people can develop a distinguishable pattern of symptoms associated with complex or multiple childhood adversities, which is also named developmental trauma disorder.

Among adolescents, those individuals who were exposure to previous victimization, for example, lived in dysfunctional families, or experienced interpersonal subtypes of index adversities had higher risk of PTSD [16, 17]. For youths who were exposed to straight interpersonal assault or threat, especially those who had been sexually abused or physically maltreated, the lifetime prevalence of PTSD symptoms was highest [18].

Furthermore, after trauma exposure, PTSD symptoms are also related to depression. Among trauma-exposed adolescents, the most common mental health issue experienced in the first year before assessment was depression [7, 12, 13]. Also, both short-term and long-term PTSD symptoms were found to be related to depression after trauma exposure [19]. The potential mechanism in the correlation between PTSD and depression were found to be the emotion regulation [20].

However, there are also problems in previous research. Firstly, in the field of the impact of the childhood NLEs on adolescent depression, there is a lack of studies on different NLE types, for there are no unified criteria for NLEs, and the classification of NLEs is also affected by the specific cultural environment of the studies. In addition, the criteria of NLEs are not detailed, for example, 'emotional abuse' is not clarified to be abused by parents or peers, and 'family violence' is not clarified as witnessing violence between parents or being physically abused by parents. Therefore, in the current study, researcher conducted a more detailed NLE criterion which is also more consistent with Chinese culture, to explore whether different kinds of trauma have different effects on depressive and PTSD symptoms in adolescents.

Furthermore, the current research is also needed to determine whether PTSD symptoms can mediate the relationship between the stress intensity of childhood NLEs and adolescent depressive symptoms.

1.2 Research Questions and Hypothesis

Therefore, there are two research questions in the present study:

Q1: Are there differences in depression and PTSD symptoms related to different types of NLEs?

H1: There are differences in depression and PTSD symptoms related to different types of NLEs.

Q2: Can past and current stress of NLEs be direct predictors of adolescent depression? Can PTSD symptoms be mediators?

H2: Past and current stress of NLEs can be direct predictors of adolescent depression. PTSD symptoms can be mediators.

2. Method

2.1 Participants

The participants are 447 Chinese adolescents from 12 to 24 years old ($M=18.52$, $SD=3.22$), in which 255 are males (57.0%) and 192 (43.0%) are girls. They were recruited from online platform, and online questionnaire were given. After filling in the consent form, the participants were asked to fill the questionnaires.

2.2 Measurements

Childhood NLEs and related stress intensity Participants were asked to choose the types of childhood NLEs and rate how much stress the had experienced at the time of the NLEs, and the current level of stress related to the NLEs, on a 7-point Likert scale ranging from 1 (low stress) to 7 (high stress). The classification of childhood NLE referred to Nishikawa's study [21] and was edited to adapt to the Chinese culture. Table 1 shows the types of childhood NLEs.

Table 1. Types of childhood NLEs in current study

No.	Type of childhood NLE
1	Death of your family member or friend
2	family violence or abuse (physical or verbal)
3	witness of family violence, conflicting and other relational problems (e.g., divorce)
4	academic stress or frustration
5	poverty or family financial problems
6	school bullying
7	interpersonal conflict
8	serious illness or injuries
9	accident or disasters
10	parental neglect, disdain or abandonment
11	others

Posttraumatic Stress Symptoms The Revised Impact of Events Scale (IES-R), which contains 22 items evaluating PTSD symptoms in the past seven days was given after a stress event [22], and each item is a 7-point Likert scale from 1 (not at all) to 5 (very great degree). Higher scores means severer PTSD symptoms. IES-R demonstrated good validity and test-retest reliability in previous studies [23]. In the current study, the consistency coefficient of IES-R is 0.947.

Depression The severity of depressive symptoms was measured by the Self-rated Depression Scale (SDS), which includes items to assess symptoms of depression within the past seven days. Each item is a 4-point Likert scale from 1(a little of the time) to 4 (most of the time) [24]. Good validity was confirmed in the original scale [25] and the Chinese version [26]. In the current study, the consistency coefficient of SDS is 0.892.

2.3 Data Analysis

SPSS 25.0 will be used for descriptive statistics, correlations, regression analysis and path models. Correlations are adopted to analyze the relationship between depressive symptoms, PTSD symptoms, and past and current stress of NLEs. Regression analysis are conducted to analyze the predicting effect of different subtypes of NLEs on depression and PTSD symptoms. Path models are used firstly to find the direct pathway from past and current stress of NLEs to depression, then evaluate the potential mediators: PTSD symptoms.

3. Results

3.1 Descriptive Statistics and Correlations

Table 2 shows the descriptive statistics and the corelations between gender,age, past and current stress intensity of childhood NLEs, PTSD symptoms and depression. Firstly, gender is signigicantly related to past stress of NLEs ($p < 0.01$), current stress of NLEs ($p < 0.01$) and PTSD scores ($p < 0.01$), which means girls are more likely rto experience higher stress intensity of childhood NLEs and severer PTSD symptoms. Age is negatively correlated with PTSD scores ($p < 0.01$). past stress of NLEs is significantly positively correlated with current stress of NLEs ($p < 0.001$), PTSD symptoms ($p < 0.001$), and depression symptoms ($p < 0.001$). Current stress of NLEs is positively correlated with PTSD symptoms ($p < 0.001$), and depression symptoms ($p < 0.001$). PTSD symptoms are positively related to depression scores ($p < 0.001$).

Table 2. Means, SDs, and relationship among main variables

	M (SD)	1	2	3	4	5	6
1. Gender (1=boys,2=girls)	1.43 (0.50)	-					
2. Age	18.52 (3.22)	.04	-				
3. Past stress of NLEs	33.15 (13.98)	.13**	.06	-			
4. Current stress of NLEs	27.23 (14.49)	.16**	.01	.84***	-		
5. PTSD symptoms	63.83 (21.31)	.15**	-.16**	.62***	.66***	-	
6. Depression	44.93 (6.82)	.03	-.08	.30***	.30***	.37***	-

3.2 Regression Analysis

The regression analysis is conducted to measure the different effects of different types of childhood NLEs on adolescent PTSD and depression symptoms. The results are shown in Table 3.

Table 3. Effects of different of childhood NLEs on adolescent PTSD and depression

	PTSD symptoms		Depression	
	β	t	β	t
Past stress of NLE 1	.05	1.38	.09	1.88
Past stress of NLE 2	.06	1.11	.15	2.39*
Past stress of NLE 3	.01	.09	.03	.49
Past stress of NLE 4	.16	3.52***	.02	.34
Past stress of NLE 5	.03	.63	-.08	-1.52
Past stress of NLE 6	.12	2.49*	.06	1.02
Past stress of NLE 7	.09	1.84	-.05	-.80
Past stress of NLE 8	.13	2.63**	.11	1.87
Past stress of NLE 9	.04	.76	.09	1.55
Past stress of NLE 10	.29	5.82***	.03	.56
Current stress of NLE 1	.09	2.22*	.11	2.14*
Current stress of NLE 2	.12	2.20*	.09	1.29
Current stress of NLE 3	.11	2.15*	-.03	-.39
Current stress of NLE 4	.23	5.45***	.06	1.02
Current stress of NLE 5	-.02	-.58	-.05	-.95
Current stress of NLE 6	.14	3.09**	.02	.42
Current stress of NLE 7	.11	2.40*	.00	.01
Current stress of NLE 8	.13	2.84**	.19	3.18**
Current stress of NLE 9	-.00	-.079	.02	.35
Current stress of NLE 10	.13	2.60*	.06	1.03

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Among the past stress of NLEs, academic stress or frustration ($p < 0.001$), school bullying ($p < 0.05$), serious illness or injuries ($p < 0.01$) and parental neglect, disdain or adandonment ($p < 0.001$)

have significant impacts on current PTSD symptoms. Family violence or abuse ($p < 0.05$) has a significant impact on current depression symptoms.

Among the current stress of NLEs, death of family member or friend ($p < 0.05$), family violence or abuse ($p < 0.05$), witness of family violence, conflicting and other relational problems like divorce ($p < 0.05$), academic stress or frustration ($p < 0.001$), school bullying ($p < 0.01$), interpersonal conflict ($p < 0.05$), serious illness or injuries ($p < 0.01$) and parental neglect, disdain or abandonment ($p < 0.05$) have significant impacts on current PTSD symptoms. Death of family member or friend ($p < 0.05$), and serious illness or injuries ($p < 0.01$) have significant impacts on current depression symptoms.

3.3 Mediating Effect Analysis

The next step is to measure the mediating effect of PTSD symptoms in the relationship of past or current stress of NLEs and adolescent depression symptom. The results are demonstrated in Table 4 and Table 5.

Table 4. The path analysis of the mediating effect (past stress of NLEs)

Dependent variables	Independent variables	R	R ²	F	β	t
Depression		.32	.10	16.47***		
	Gender				-.01	-.15
	Age				-.10	-2.23
PTSD symptoms	Past stress of NLEs				.31	6.75***
		.65	.43	110.63***		
	Gender				.07	1.90
Depression	Age				-.20	-5.49***
	Past stress of NLEs				.62	17.18***
		.38	.15	18.83***		
	Gender				-.03	-.58
	Age				-.05	-.99
	PTSD symptoms				.13	2.30*
	Past stress of NLEs				.28	4.84***

Notes: * $p < 0.05$, *** $p < 0.001$.

Table 5. The path analysis of the mediating effect (current stress of NLEs)

Dependent variables	Independent variables	R	R ²	F	β	t
Depression		.31	.10	15.71***		
	Gender				-.01	-.28
	Age				-.09	-.19
PTSD symptoms	Current stress of NLEs				.30	6.58***
		.68	.46	128.05***		
	Gender				.049	1.40
Depression	Age				-.17	-4.80***
	Current stress of NLEs				.65	18.57***
		.38	.14	18.28***		
	Gender				-.03	-.61
	Age				-.04	-.81
	PTSD symptoms				.29	4.86***
	Current stress of NLEs				.11	1.84

Notes: *** $p < 0.001$.

Table 6 and Table 7 shows the total, direct and mediation effects of past and current stress of NLEs on depression symptoms.

Table 6. Total, direct and indirect effects of past stress of NLEs on depression symptoms

	Effect size	Boot SE	Boot LLCI	Boot ULCI	Proportion of effects
Total effect	.15	.02	.00	.11	
Direct effect	.06	.03	.02	.11	42.93%
Indirect effect	.09	.02	.05	.12	57.07%

Table 7. Total, direct and indirect effects of current stress of NLEs on depression symptoms

	Effect size	Boot SE	Boot LLCI	Boot ULCI	Proportion of effects
Total effect	.14	.02	.00	.10	
Direct effect	.05	.03	.07	-.00	36.44%
Indirect effect	.09	.02	.05	.13	63.56%

The model 1 linking past stress of NLEs, PTSD, and depression were all significant ($p < 0.05$), indicating a partial mediation (see Fig. 1). The model 2 shows that the predicting effects of current stress of NLEs on PTSD symptoms, PTSD symptoms on depression are statistically significant ($ps < 0.001$), while the current stress of NLEs was not a significant predictor of depression, which indicated that there was a full mediation of PTSD symptoms in the relationship between current stress of NLEs and depression (see Fig. 2).

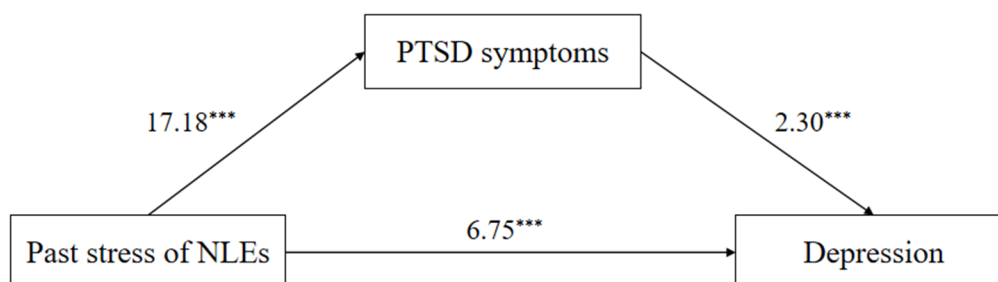


Fig. 1 PTSD symptoms as a mediator between past stress of NLEs and adolescent depression
(*** $p < .001$)

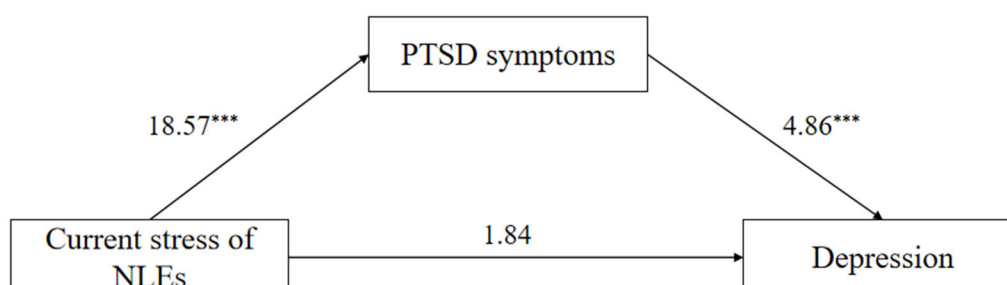


Fig. 2 PTSD symptoms as a mediator between current stress of NLEs and adolescent depression
(*** $p < .001$)

4. Discussion

The aim of the study was to understand how subtypes of childhood negative life events (NLEs) contribute to adolescent post-traumatic stress disorder (PTSD) symptoms and depression, as well as the mediating effects of PTSD symptoms in the relationship of stress of NLEs and depression.

Similar to the results of previous studies [14, 15], the past and current perceived stress of childhood NLEs were correlated with adolescent PTSD and depression symptoms, and girls are more likely to experience higher stress of NLEs both in the past and the present.

As for the impact of impacts of different NLEs on adolescent PTSD and depression symptoms, part of our results were the same as previous researches: for instance, there was a significant relationship between both past and current stress of parental neglect and adolescent PTSD symptoms [18], past perceived stress of family abuse and parental neglect had significant impact on depression [6]. What is more, distinct to previous studies, the current outcomes suggested the among the NLEs, past stress of school bullying, academic stress and serious illness or injuries had great effects on adolescent PTSD symptoms. In further studies, the effects of these two subtypes of childhood NLEs on adolescent PTSD should be taken into consideration. Another conflict was whether domestic physical abuse impact adolescent PTSD symptoms. For example, Hoeboer [27] found there was no significant correlation between physical abuse and adolescent PTSD while Adams and his colleagues [28] had opposite views. The current results indicated there was a significant relationship, as well as a relationship between witness of family violence and adolescent PTSD. In addition, the current perceived stress of childhood interpersonal conflict also had an impact on PTSD scores, which is consistent with a Japanese study [21]. However, although interpersonal relationship is an important part in an individual's early life, few studies included interpersonal conflict as a subtype of childhood NLEs. Further researches should consider more about interpersonal problems. Finally, for individuals who still perceive stress of death of friends or family members in childhood, the stress also had an impact on depression symptoms.

Furthermore, path analysis demonstrated that past and current perceived stress of NLEs were direct and indirect predictors of current depression via PTSD symptoms as a mediator.

Disadvantages of this study includes: Firstly, sexual abuses was not mentioned, in view of the culture bias against sex content in China. However, sexual abuse is an important category of childhood NLEs and should be further examined in more private studies. Secondly, some results are inconsistent with previous researches, larger sample and cross-cultural researches are needed in the future. In Further studies, more variables related to childhood NLEs can be considered, such as the number and timing of NLEs, post-traumatic growth and resilience. In the future, PTSD and related childhood NLEs should be treated during the intervention of adolescent depression.

5. Conclusion

Past and current perceived stress of childhood NLEs were related to adolescent PTSD and depression symptoms. Different subtypes of childhood NLEs contribute differently to PTSD and depression symptoms. PTSD symptoms can mediate the relationship between both past and current stress of NLEs and adolescent depression. These results have implications on interventions for adolescent depression and future studies in this field.

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