



Paternal Co-parenting and Adolescent Non-suicidal Self-injury: the Mediating Role of Adolescent Self-blame and Depressive Symptoms

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Abstract. Objective To explore the mediating role of adolescent self-blame and depressive symptoms between paternal co-parenting and adolescent non-suicidal self-injury. **Methods** Teenagers and their parents completed the online questionnaire survey using a convenience sampling method from May to July 2022. The Adolescence Revision of Co-parenting Scale (CPS), Co-parenting Relationship Scale (CRS), Self-blame subscale of Depressive experience Scale, Center for Epidemiologic Studies Depression Scale, Non-Suicidal Self-injury Scale (NSSI) were employed, the mediating effect of adolescent self-blame and depressive symptoms between paternal co-parenting and adolescent non-suicidal self-injury was examined using a structural-equation model and Bootstrap method. **Results** A total of 2,572 teenagers and 1830 mothers of teenagers completed the questionnaires, of which 1,832 questionnaires of teenagers and 1,623 of the latter were valid, with an effective recovery rate of 77.2% and 88.7% respectively. 572 pairs of teenagers and mothers were from the same family. The score of the dimensions of paternal co-parenting was (14.27 ± 8.20) and (3.11 ± 3.24) evaluated by the teenager and their mother; The score of adolescent self-blame was (2.61 ± 1.04) ; The score of adolescent depressive symptoms was (7.32 ± 6.01) . Adolescent self-blame ($\beta=0.377, P<0.001$) and depressive symptoms ($\beta=0.220, P<0.001$) played a mediating role between paternal co-parenting and adolescent non-suicidal self-injury; they also exerted a chain mediating effect on adolescent non-suicidal self-injury (95%CI: 0.175, 0.152). **Conclusion** Paternal co-parenting exerted significant impacts on adolescent mental health. Negative paternal co-parenting can lead to adolescent self-blame and depressive symptoms living in a negative family environment. Adolescent depressive symptoms such as low mood and low self-worth are the manifestation of adolescent mental health, and it's also one of the important reasons for adolescent non-suicidal self-injury. In the present study, the results showed that paternal co-parenting could impact adolescent non-suicidal self-injury through the chain mediating effect of adolescent self-blame and depressive symptoms.

Keywords: Paternal co-parenting; self-blame; depressive symptoms; non-suicidal self-injury; adolescent

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1 Introduction

Non-suicidal self-injury (hereinafter referred to as self-injury) refers to the behavior of individuals who intentionally injure their bodies without suicidal ideation^[1,2]. A global meta-analysis of self-injury among adolescents showed that the lifetime prevalence of self-injury among adolescents was 22%, and the prevalence of self-injury in the past 12 months was 23.2%^[3]. Self-injury is also an important risk factor for adolescent suicidal behavior^[4], so there is a need for researching and exploring its occurrence and effects.

Previous studies showed that family environment was an important predictor of adolescent self-injury^[5]. With the change in parenting concepts, more fathers consciously participate in the process of raising their children^[6], and co-parenting has an important impact on the mental health of adolescents^[7]. Co-parenting refers to the mutual division of labor and the relationship between parents in raising children^[8]. Studies showed that conflicting relationships between parents can trigger adolescent self-injury^[9]. When teenagers live in an environment of parental conflict for a long time, they will feel insecure^[10] and have self-critical thoughts^[11]. Self-blame refers to the internal denial and negative evaluation of themselves^[12]. Self-blame accumulates and may lead to depressive symptoms such as low mood and low self-worth in adolescence^[13].

Existing studies lack an in-depth exploration of the influence of paternal co-parenting on adolescent self-injury. This study will explore whether adolescent self-blame and depressive symptoms play mediating role between paternal co-parenting and adolescent self-injury, so as to provide evidence for the prevention and intervention of adolescent self-injury.

2 Background

Using the convenient sampling method, electronic questionnaires were distributed to adolescents and their parents in Henan, Tianjin, and Inner Mongolia from May to July 2022. The questionnaires were completed online after the informed consent of the school, parents and adolescents.

3 Method

3.1 Questionnaire

The content collected by the questionnaire survey includes: (1) Demographic information, including gender, age, grade, household location of the teenagers, and education, occupation, marital status, and monthly family income of the teenagers' mothers. (2) The paternal co-parenting situation is assessed by the multi-reporter of adolescents and their mothers. Mothers were scored using the brief Coparenting Relationship Scale (Brief CRS)^[14] developed by Feinberg et al. The mother reported the performance of the father in co-parenting, and the parenting conflict dimension in the scale was selected, with a total of 2 items; and a 7-point score was used, ranging from 0 to 6 points. The higher the score, the greater the conflict between the father and the mother in co-

parenting. The Cronbach's α coefficient of this dimension in this study is 0.86. Adolescents are scored using the parenting conflict dimensions of the Co-parenting Scale compiled by Liu Chang et al. [15], with a total of 6 items and a 7-point score, ranging from 1 to 7. The higher the score, the greater the conflict between the father and the mother. In this study, the Cronbach's α coefficient of this dimension is 0.93. (3) Self-blame scale was utilized, using the self-blame subscale in the short version of the depression experience questionnaire compiled by Bagby et al. [16]. This subscale has 8 items and is scored on 5 points from 1 to 5; the average score of all items is calculated. A higher score indicates a higher degree of self-blame. The Cronbach's alpha coefficient of the questionnaire is 0.91. (4) Depression scale, using the simplified version of the Center for Epidemiologic Studies Depression Scale (CES-D) revised by He Jin et al. [17], with a total of 9 items. The content includes negative thoughts and emotions such as low mood and decreased interest. A score of 0 to 3 is used to evaluate the frequency of the above symptoms within a week. The higher the score, the more severe the depressive symptoms. In this study, the Cronbach's alpha coefficient of the questionnaire is 0.92. (5) The Non-Suicidal Self-injury scale compiled by You et al. [18], is used to assess the number of self-injury behaviors of adolescents in the past six months. The scale has 7 items and uses 4-point scoring, 1 means "0 times", 2 means "1 to 2 times", 3 points means "3 to 5 times", and 4 points means "6 times or more". Average scores were calculated for all items, with higher scores indicating greater self-injury tendencies in adolescents. In this study, the Cronbach's alpha coefficient of the self-injurious behavior scale is 0.89.

3.2 Analysis of the mediating effect of adolescent self-blame and depressive symptoms

Amos 26.0 was used to establish a structural equation model, paternal co-parenting was taken as an independent variable, adolescent self-blame and depressive symptoms as mediator variables, adolescent self-injury as a dependent variable, adolescent gender and whether adolescent was only one child in the family as control variables.

3.3 Statistical analysis

SPSS 26.0 was used for statistical analysis. Quantitative data that obey the normal distribution are described by mean standard deviation ($\bar{x} \pm s$), while variables that do not obey the normal distribution are described by the median and quartile [M (QR)]. The correlation between paternal co-parenting, adolescent self-blame, depressive symptoms, and self-injury was analyzed by Spearman rank correlation analysis, and the difference at $P < 0.05$ was statistically significant.

4 Results

4.1 Background data

A total of 2,572 and 1,830 adolescents and teenager mothers were investigated, and 1,832 and 1,623 valid questionnaires were received. After excluding those with regular answers, too short answering time, and passing the screening of polygraph questions, the effective rates of the questionnaires were 77.2% and 88.7%. The mother and adolescent samples were paired, and 572 valid questionnaires were obtained. The adolescents ranged in age from 12 to 17 (14.19±1.44). Among them, 251 were boys (43.88%) and 321 were girls (56.12%). About the education levels of mothers: 279 (48.78%) mothers had completed junior high school education or below, 73 (12.76%) mothers had completed high school/technical secondary school level, 71(12.41%) mothers had completed junior college level, and 149 (26.05%) mothers had completed undergraduates and above. In terms of socioeconomic background of the families, 368 (64.34%) families had a monthly household income of 10,000 yuan or less, 105 (18.36%) families had a monthly household income of 10,000 to 20,000 yuan, 53 (9.27%) families had a monthly household income of 20,000 to 30,000 yuan, and 46 (8.04%) families had a monthly household income of 30,000 yuan or more.

4.2 Scores of co-parenting by fathers, adolescent self-blame, depressive symptoms and adolescent self-injury

The scores of teenagers and mothers on co-parenting were (14.27±8.20) and (3.11±3.24) respectively; the scores of teenagers' self-blame were (2.61±1.04); the scores of teenagers' depressive symptoms were (7.32±6.01). Adolescent self-injury did not follow normal distribution and was described by median and interquartile range [M (QR)]. See Table 1.

Table 1. Comparison of adolescent self-injury scores

Project	Number of people [people (%)]	Teen non-suicidal self-injury [M (QR)]	Item	Number of people [people (%)]	Teen non-suicidal self-injury [M (QR)]
Gender			Grade		
Female	321 (59.0%)	1.00 (0.14)	Junior high school	477 (87.7%)	1.00 (0.14)
Male	251 (46.1%)	1.00 (0.00)	High school	48 (8.8%)	1.00 (0.14)
Z/t value		-3.36a -	Vocational high school	47 (8.6%)	1.00 (0.14)
P value		0.00	χ^2 / F value		0.76b -
Household address			P value		0.68
Town	274 (50.4%)	1.00 (0.14)	Mother's education		

The country-side	298 (54.8%)	1.00 (0.14)	Junior high school and below	279 (51.3%)	1.00 (0.14)
Z/t value		-1.50a -	High School/Technical Secondary School	73 (13.4%)	1.00 (0.14)
P value		0.13	Junior college	71 (13.1%)	1.00 (0.14)
One child in family			Undergraduates and above	149 (27.4%)	1.00 (0.00)
Not one child	373 (68.6%)	1.00 (0.14)	χ^2 / F value		3.59b -
Only one child	199 (36.6%)	1.00 (0.00)	P value		0.31
Z/t value		-2.51a -	Monthly family income		
P value		0.01	10,000 yuan and below	368 (67.6%)	1.00 (0.14)
One-parent family			10,000-20,000 yuan	105 (19.3%)	1.00 (0.07)
Non-single parent	553 (101.7%)	1.00 (0.14)	20,000-30,000 yuan	53 (9.7%)	1.00 (0.14)
Single parent	19 (3.5%)	1.00 (0.57)	30,000 yuan and above	46 (8.5%)	1.00 (0.14)
Z/t value		-1.52a -	χ^2 / F value		1.98b -
P value		0.13	P value		0.58

Note: ^a means Mann-Whitney *U* test; ^b means Kruskal-Wallis *H* test.

4.3 Correlation analysis of paternal co-parenting, adolescent self-blame, adolescent depressive symptoms and adolescent self-injury

Correlation analysis showed that adolescents' and mothers' evaluation of paternal negative co-parenting, adolescent self-blame, adolescent depression symptoms and adolescent self-injury were significantly and positively correlated in pairs. Shown in Table 2.

Table 2. Descriptive statistics and correlation analysis of variables in Table 2 (*n*=572)

Variable	<i>M</i> ± <i>SD</i>	1	2	3	4	5
Co-parenting						
1 Teen comments	14.27±8.20	1				
2 Mother comments	3.11±3.24	.433**	1			
Teen comments						
3 Self-blame	2.61±1.04	.354**	.198**	1		
4 Depression	7.32±6.01	.429**	.196**	.703**	1	
5 Teens Self Injury	1.18±0.42	.282**	.155**	.419**	.548**	1

Note: ***P*<0.01.

Table 3. Mediating mechanism of adolescent self-blame, depressive symptoms between paternal co-parenting and adolescent self-injury

Path	Standardized indirect effects	Effect size	95% confidence interval	
			Lower limit	Upper limit
Paternal co-parenting → teen depressive symptoms → teen self-injury	(0.22×0.48) = 0.105	43.57%	0.064	0.149
Paternal co-parenting → adolescent self-blame → adolescent depressive symptoms → adolescent self-injury	(0.38×0.62×0.48) = 0.113	46.89%	0.175	0.152
Total mediation effect	0.241			

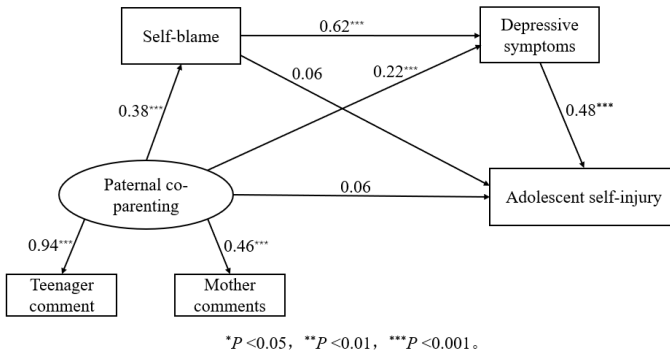


Fig. 1. The mediating effect model of adolescent self-blame and depressive symptoms between paternal co-parenting and adolescent self-injury

4.4 The mediating effect of adolescent self-blame and depressive symptoms on the relationship between paternal co-parenting and adolescent self-injury

The path coefficients among the variables are shown in the mediation model of Figure 1. The fitting indicators are as follows: $\chi^2=2.19$, $\chi^2/df=1.10$, $RMSEA=0.013$, $NFI=0.99$, $RFI=0.98$, $TLI=0.99$, indicating that the model fits well. The Bootstrap method was used to sample 5000 times repeatedly, and a 95% confidence interval was used. When 0 was not included in the interval, the effect was significant. There is a chain mediating effect in the result, as shown in Table 3.

5 Discussion

This study indicates that the effect of paternal co-parenting on adolescent self-injury is mediated through the chain of adolescent self-blame and depressive symptoms.

First, adolescent depressive symptoms mediate the relationship between paternal co-parenting and adolescent self-injury. According to the family system theory ^[19], the relationship between family members affects each other, and the relationship between parents has an important impact on children's mental health ^[7]. Negative paternal co-parenting, such as frequent conflicts between fathers and mothers, could lead to adolescent depressive symptoms living in the tense family environment. It showed that both negative paternal co-parenting and adolescent depressive symptoms were important factors for predicting adolescent self-injury ^[20].

Second, the chain mediating effect of adolescent self-blame and depressive symptoms on the relationship between paternal co-parenting and adolescent self-injury is also explained. Studies have found that when parents often have conflicts, adolescents' internal positive emotional experience will decrease and self-blame will continue to increase ^[21]. When they accumulate excessive self-blame and negative emotions, it will lead to depressive symptoms ^[22]. According to the emotion regulation model of self-injury ^[23], adolescents will deal with internal high negative emotions with self-injury behaviors, which is also consistent with previous research ^[24].

6 Conclusion

The impact of paternal co-parenting on adolescent self-injury is suggested through the multi-reporting method of adolescents and mothers. The results suggest how negative paternal co-parenting influences adolescent self-injury. This indicates that attention should be given to the relationship between parents in the process of raising children. There is need to enhance the good cooperative relationship between them to reduce the self-blame and depressive symptoms of adolescents, so as to prevent and reduce the occurrence of adolescent self-injury.

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