



Childhood Maltreatment and Depression in Adulthood in Chinese Female College Students: The Mediating Effect of Coping Style

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Depression is the most common psychological disorder of female, with high disability rate and remarkable mortality rate. There is a lack of knowledge about childhood experience, coping style, and adult depression. The aim of the present research was to enrich this knowledge by investigating the mediating effect of coping style between childhood maltreatment and depression in adulthood in Chinese female college students. Self-report questionnaires assessing childhood maltreatment, depression, and coping style were completed in 738 participants. The results illustrated that childhood maltreatment was positively related to depression in adulthood while coping style was negatively related to depression. In addition, childhood maltreatment could influence adult depression through the mediating role of coping style. These findings indicate that childhood maltreatment and negative coping style are associated with depression in adulthood. Psychological intervention strategies for coping style could provide effective treatment direction for depression caused by childhood maltreatment.

Keywords: childhood maltreatment, depression, coping style, mediating effect, psychological intervention

INTRODUCTION

Depression is the leading cause of disability among people across the globe. It was estimated that the proportion of people suffering from depression in 2015 was 4.4%, and women (5.1%) were more common than men (3.6%) (1). Depression is common among the youth, and often indicates chronic and recurrent diseases in adulthood. A systematic review of medical students showed that the prevalence of depression or depressive symptoms was 27.2%, and the prevalence of suicidal ideation was 11.1% (2). Many psychosocial factors may affect depression, including cognitive impairment, stressor in life and circumstance, parental depression, interpersonal distress, and female gender (3). Childhood maltreatment, as one of the stressors in life, has been considered as a factor leading to depression (4). Therefore, the understanding of depression should not only consider its physiological susceptibility, but also focus on the individual's childhood experience and other psychosocial factors.

Childhood maltreatment (CM) includes many forms, involving emotional, physical and sexual abuse, as well as emotional and physical neglect (5). CM has been recognized as a crucial risk factor for depression. High levels of emotional and/or sexual abuse were associated with more significant severity of depression, and more markedly associated with depression than physical

abuse (6). In other words, although each type of CM was positively correlated with the severity of depression, emotional abuse and emotional neglect were the strongest (7). The probability of depression in adulthood with CM experience was 2.66–3.73 times higher than that of normal people. The early onset age was more likely to develop into chronic or refractory depression (8). Although CM increases the risk of depression, not all abused children become depressed. Some modifiable factors increase vulnerability to, or act as a buffer against, depression. Coping style had a significant mediating effect between stressor and psychological distress (9). Maladjusted coping was the main predictor of depression and reduction of maladjusted coping behavior might have the most positive effect on the relief of depression (10).

To sum up, depression is a high incidence of psychological disorders, seriously endangering the health of female youth, even life-threatening. There are many causes of depression and CM is a crucial one. Many empirical studies have revealed the link between CM and depression. It is less clear what coping strategies might be used to assist individuals in decreasing depression cause by CM. In this research, we hypothesize that CM is not only an important predictor of adult depression, but also might be used to directly predict the severity of depression. And through the mediating effect of coping style, the severity of depression is indirectly affected.

METHODS

Participants and Procedure

Seven hundred forty-five female college students were selected by cluster sampling. Seven hundred thirty-eight (99.1%) consented and took part in the current study, average age 19.4 years ($SD = 1.1$, range = 17–23). Two hundred eighty-four (38.5%) came from rural area and 454 (61.5%) from urban area. One hundred forty-six (19.8%) majored in science and engineering, 296 (40.1%) in medicine, 85 (11.5%) in art, and 211 (28.6%) in liberal arts.

The assessment was conducted in class under the supervision of research team members. The survey lasted 20 min. The study was approved by the Human Research Ethics Committee of NJUCM. Approval was also granted by each college. Research

information was provided directly to participants and informed consent and consent were obtained.

Measures

The Hospital Anxiety and Depression Scale [HADS; (11)] is a self-evaluation scale which examines anxiety and depression symptoms, respectively. The total score of depression or anxiety can be regarded as the severity of symptoms. HADS had good reliability and validity (12). In the current study, internal consistency $\alpha = 0.81$.

The Simple Coping Style Questionnaire [SCSQ; (13)] contains 20 items assessing coping style which effectively reflect individual's coping style in the context of Chinese culture. Items 1–12 belong to positive coping and 13–20 belong to negative coping. The score of each item is from 0 (never) to 3 (always). If the average difference between positive coping and negative coping is >0 , it is positive coping and <0 is negative coping. The internal consistency coefficient of the scale was 0.90 and the test-retest reliability was 0.89 (13). In the present study, total questionnaire internal consistency $\alpha = 0.75$.

Personal Report of Childhood Abuse [PRCA; (14)] is compiled in the context of Chinese culture. It contains 20 items and measures the frequency and severity of abuse in childhood. The scale includes four sub-scales of physical abuse (PA), emotional abuse (EA), sexual abuse (SA), and neglect. Higher score indicates more severe CM. The Cronbach's α coefficient of the total scale and the four sub-scales of PRCA ranged from 0.604 to 0.839 in college students (15). In the current study, internal consistency $\alpha = 0.88$.

Statistical Analysis

All analyses were performed using SPSS22.0. All statistical tests were two-sided and the significance level was set at $p < 0.05$. Partial correlation was used to examine correlations among depression, CM and coping style. Because the scores of PRCA and subscales did not conform to normal distribution, Kruskal-Wallis method was used for nonparametric test to compare the differences in different depression status. The bootstrap method of Preacher and Hayes (16) and Hayes (17) was used to test the mediating effect.

TABLE 1 | Partial correlation of various variables after controlling potential age effect.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---------------------|-----------|-----------|-----------|----------|-----------|-----------|---|
| 1. PRCA | 1 | | | | | | |
| 2. PA | 0.816*** | 1 | | | | | |
| 3. EA | 0.952*** | 0.723*** | 1 | | | | |
| 4. SA | 0.244*** | 0.224*** | 0.154*** | 1 | | | |
| 5. Neglect | 0.751*** | 0.434*** | 0.588*** | 0.209*** | 1 | | |
| 6. Coping style | -0.138*** | -0.102*** | -0.119*** | -0.089* | -0.125*** | 1 | |
| 7. Adult depression | 0.191*** | 0.119*** | 0.171*** | 0.106*** | 0.195*** | -0.437*** | 1 |

PRCA, personal report of childhood abuse; PA, physical abuse; EA, emotional abuse; SA, sex sbuse.

* $p < 0.05$ (two-tailed), *** $p < 0.001$ (two-tailed).

TABLE 2 | Nonparametric test of childhood maltreatment at different depression status.

| Group | ① | ② | ③ | χ^2 |
|---------|-------------|-------------|-------------|----------|
| PRCA | 1.99 ± 4.23 | 3.79 ± 5.83 | 4.64 ± 5.79 | 22.06*** |
| PA | 0.43 ± 1.14 | 0.59 ± 1.22 | 0.86 ± 1.64 | 3.61 |
| EA | 1.04 ± 2.37 | 1.94 ± 3.39 | 2.60 ± 3.47 | 20.56*** |
| SA | 0.01 ± 0.12 | 0.06 ± 0.32 | 0.07 ± 0.34 | 8.37* |
| Neglect | 0.49 ± 1.15 | 1.13 ± 1.87 | 1.02 ± 1.60 | 19.05*** |

PRCA, personal report of childhood abuse; PA, physical abuse; EA, emotional abuse; SA, sex abuse; ①, asymptomatic; ②, suspicious depression; ③, symptomatic depression. * $p < 0.05$ (two-tailed), *** $p < 0.001$ (two-tailed).

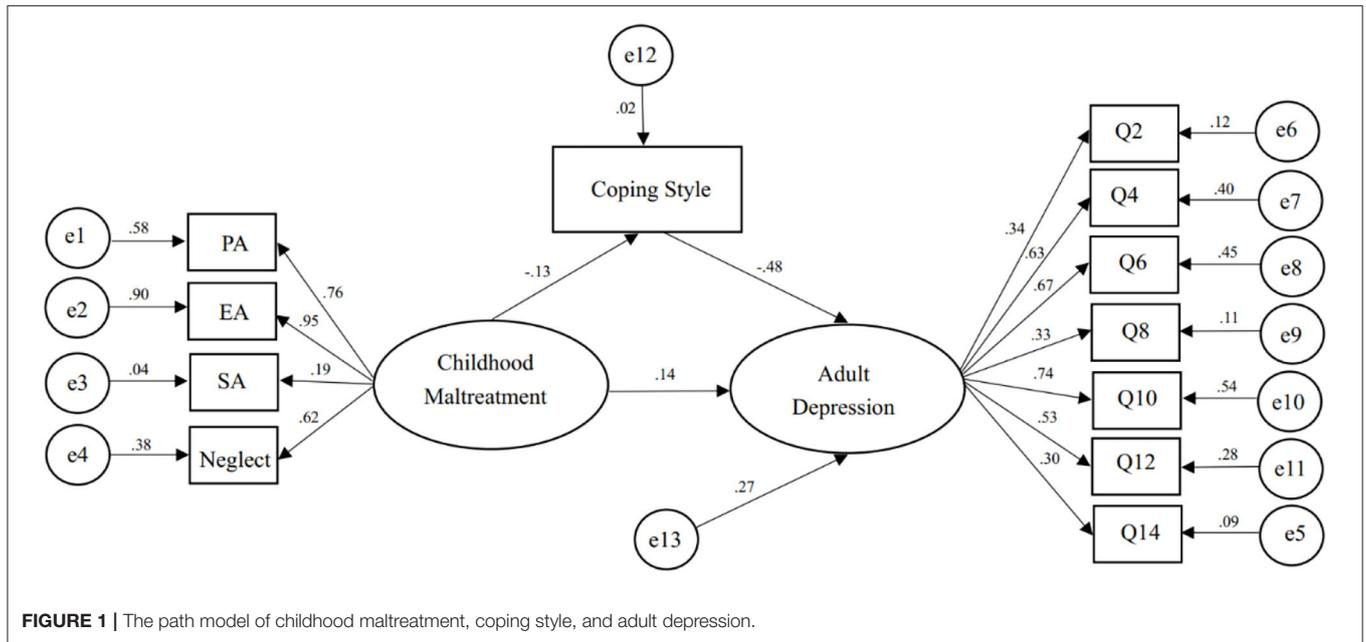


FIGURE 1 | The path model of childhood maltreatment, coping style, and adult depression.

TABLE 3 | Fitting index of intermediary model.

| χ^2 | df | χ^2/df | RMSEA | GFI | NFI | IFI | CFI |
|----------|----|-------------|-------|-------|-------|-------|-------|
| 151.329 | 52 | 2.91 | 0.051 | 0.967 | 0.924 | 0.949 | 0.949 |

df, degree of freedom; RMSEA, root mean square error of approximation; GFI, goodness of fit index; NFI, normed fit index; IFI, incremental fit index; CFI, comparative fit index.

RESULTS

Correlations Among Childhood Maltreatment, Coping Style, and Adult Depression

The correlations among CM, adult depression and coping style are shown in **Table 1**. As revealed in the table, CM was positively related to adult depression, whereas coping style was negatively related to CM and adult depression.

The Relationship Between Childhood Maltreatment and Depression in Adulthood

According to the score of HADS, the participants were divided into three groups: asymptomatic (79.7%), suspicious depression

(14.6%), and symptomatic depression (5.7%). The relationship between adult depression and CM is shown in **Table 2**. As revealed in the table, there were obvious differences in PRCA [$\chi^2(2,735) = 22.06, p < 0.001$], as well as emotional abuse [$\chi^2(2,735) = 20.56, p < 0.001$], sexual abuse [$\chi^2(2,735) = 8.37, p < 0.05$], and neglect [$\chi^2(2,735) = 19.05, p < 0.001$] among different depression status.

The Mediating Effect of Coping Style on the Relationship Between Childhood Maltreatment and Depression in Adulthood

Taking CM as latent variable, the path model between CM, coping style and adult depression was constructed to verify the mediating effect of coping style (**Figure 1**). The fitting index of

TABLE 4 | Analysis of total effect, direct effect and indirect effect.

| | Effect value | Boot SE | Boot CI lower | Boot CI upper | Relative effect value |
|-----------------|--------------|---------|---------------|---------------|-----------------------|
| Total effect | 0.207 | 0.054 | 0.109 | 0.321 | |
| Direct effect | 0.144 | 0.041 | 0.054 | 0.244 | 69.6% |
| Indirect effect | 0.063 | 0.020 | 0.027 | 0.107 | 30.4% |

Boot SE, Boot CI Lower, and Boot CI Upper refer to the standard error of indirect effect estimated by percentile bootstrap method corrected by deviation, the lower limit and upper limit of 95% confidence interval, respectively.

TABLE 5 | Regression equations of the mediating effect of coping style.

| Variable | Path | Regression equation |
|-----------------|------------------|---------------------|
| PA, CS, AD | PA → CS | $M = -0.10X$ |
| | PA, CS → AD | $Y = 0.08X - 0.43M$ |
| | PA → AD | $Y = 0.12X$ |
| EA, CS, AD | EA → CS | $M = -0.12X$ |
| | EA, CS → AD | $M = -0.12X$ |
| | EA → AD | $Y = 0.12X - 0.42M$ |
| SA, CS, AD | SA → CS | $M = -0.09X$ |
| | SA, CS → AD | $Y = 0.07X - 0.43M$ |
| | SA → AD | $Y = 0.11X$ |
| Neglect, CS, AD | Neglect → CS | $M = -0.13X$ |
| | Neglect, CS → AD | $Y = 0.14X - 0.42M$ |
| | Neglect → AD | $Y = 0.20X$ |

PA, physical abuse; EA, emotional abuse; SA, sex abuse; CS, coping style; AD, adult depression.

the model basically conformed to the standard of commonly used fitting statistics (Table 3). The standardized 95% CI of total effect of CM on depression was (0.109, 0.321), direct effect was (0.054, 0.244), indirect effects was (0.027, 0.107), excluding 0. Therefore, the overall effect, direct and indirect effects were significant. In the model, the overall effect of CM on adult depression was $c = 0.207$, $a = -0.133$, $b = -0.476$, $c' = 0.144$, all of which reached a significant level. This presented that CM could not only directly predict adult depression, but also influence depression through the mediating effect of coping style. The direct effect (0.144) and mediating effect (0.063) accounted for 69.6 and 30.4% of the total effect (0.207), respectively (Table 4).

Furthermore, four subscales of PRCA were used as independent variables and adult depression as dependent variable to test the mediating effects of coping style. The results showed that physical abuse ($\beta = 0.12$, $t = 3.25$, $p < 0.01$), emotional abuse ($\beta = 0.17$, $t = 4.72$, $p < 0.01$), sexual abuse ($\beta = 0.11$, $t = 2.88$, $p < 0.01$) and neglect ($\beta = 0.20$, $t = 5.41$, $p < 0.001$) had significant positive effects on adult depression. After adding coping styles, physical abuse ($\beta = 0.08$, $t = 2.26$, $p < 0.01$), emotional abuse ($\beta = 0.12$, $t = 3.66$, $p < 0.001$), sexual abuse ($\beta = 0.07$, $t = 2.05$, $p < 0.05$), and neglect ($\beta = 0.14$, $t = 4.29$, $p < 0.001$) still had significant effects on adult depression. The regression equations of the mediating effect of coping style on the four subscales of PRCA and adult depression is shown in Table 5.

DISCUSSION

The consequences of CM can be short-term or even continue to adulthood, so it is a serious social and public health problem (18). CM is closely related to depression in adulthood. Therefore, it is important to understand the mechanism of their interaction for the provision of prevention and intervention services, which can help individuals with CM experience to better deal with emotional problems. CM is an important risk factor for health problems in adulthood, stress and coping strategies may affect this relationship (19). This study aims to explore the mediating role of coping style between CM and adult depression. In this study, we illustrate that compared with physical abuse, emotional abuse shows significant differences at different depression status, which is consistent with previous research (6). More importantly, the results indicate that coping style plays an exact mediating role between CM and adult depression. A study from Canada shows that positive coping strategies as a mediator can buffer the impact of childhood abuse on adult psychological distress, which is consistent with the results of this study, suggesting that the mediating role of coping styles between CM and adult depression may be cross-cultural (20). The findings of this study support the view that individuals who encounter CM will increase the severity of depression if they adopt negative coping style, while positive coping style can reduce the negative effects of CM to a certain extent. In addition, female youth with high degree of CM use more negative coping strategies and less adaptive coping skills, which affects their psychological health.

This study provides a valuable direction for the effective intervention of depression by investigating the mediating role of coping style on CM and adult depression. Coping is an individual's conscious, purposeful and flexible adjustment behavior to the change of real environment. Individuals can evaluate and regulate the physical and emotional responses related to stress events by coping. Although people may suffer different kinds of stress events, their coping styles are often stable and consistent. Some tend to adopt positive strategies, such as seeking support and changing the belief system, while others tend to adopt negative strategies, such as avoidance and emotional venting. Previous studies also found that inappropriate coping strategies such as self-blame, denial and abandonment were the main predictors of depression, anxiety, and stress (10). This study illustrated that coping style can be used as an intermediary variable to regulate the effect of CM on adult depression. For any person, childhood experience is an established fact that has happened and can't be changed. However,

coping style can be changed through purposeful training and intervention as to actively adjust the individual's mental and physical state.

In this study, we tested the hypothesis that CM not only positively predicted adult depression, but also indirectly affected adult depression through coping style. The contribution of this study is to verify the mediating effect of coping style on CM and adult depression, which can provide guidance for psychological intervention of depression. The limitation of this study is that how to adjust coping strategies to alleviate depression needs more empirical research. In addition, the subjects of this study are female college students, and the sampling scope will be further expanded in the future. Moreover, considering the differences of cultural factors in various countries on the specific manifestations of CM, we chose the questionnaire compiled by Chinese scholars. In future research, we might try to select tools with more items and details, such as Childhood Trauma Questionnaire (CTQ) to verify whether there would be more findings.

DATA AVAILABILITY STATEMENT

The original contributions generated for the study are included in the article/**Supplementary Materials**, further inquiries can be directed to the corresponding author/s.

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ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Human Research Ethics Committee of NJUCM. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

ZZ is responsible for design and writing. WH and YZ are responsible for questionnaire test and data analysis. NZ is for revising. All authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

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Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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