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ORIGINAL RESEARCH

The Role of Alexithymia and Moral Disengagement in Childhood Physical Abuse and Depressive Symptoms: A Comparative Study Among Rural and Urban Chinese College Students

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Purpose: There is robust evidence indicating the adverse association between childhood abuse and depressive symptoms. However, the ways in which childhood physical abuse is indirectly associated with adulthood depressive symptoms by alexithymia and moral disengagement remain poorly understood, particularly in the context of China. The present study aims to investigate how childhood physical abuse may be associated with depressive symptoms via the serial mediation effects of alexithymia and moral disengagement among college students in China.

Methods: A total of 686 college students (female: 53.2%) aged from 17 to 28 years old (*M* = 21.33; *SD* = 2.53) were recruited from mainland China to participate in an online survey assessing the variables of interest. Structural equation modeling and multiple group analysis were performed using M*plus* 7.0 to investigate the hypothesized model.

Results: College students' experiences with childhood physical abuse was significantly associated with their depressive symptoms. This relationship was partially mediated by alexithymia and then by moral disengagement. Meanwhile, alexithymia and moral disengagement had a chain mediating effect on childhood physical abuse and depressive symptoms. Furthermore, multigroup analysis revealed that the association between alexithymia and depressive symptoms was stronger among rural students compared to urban students. Furthermore, the mediation model involving moral disengagement applies exclusively to rural students.

Conclusion: Alexithymia and moral disengagement exerted serial mediating effect on the association between childhood physical abuse and depressive symptoms. This pattern was particularly pronounced among rural students. These findings underscore the importance of addressing both childhood adversity and maladaptive cognitive processes in the prevention and treatment of depression.

Keywords: childhood physical abuse, depressive symptoms, alexithymia, moral disengagement, urban-rural areas

Introduction

Child physical abuse is a widespread issue with enduring consequences on the development, adjustment, and overall well-being of children.[1,2] Physical abuse is typically defined as non-accidental injuries inflicted by adults,[3] involving overt violence or excessive punishment (poisoning, extreme temperatures).[4] In the context of China, heavily influenced by Confucian ethics, a significant number of parents regard their children as possessions to be disposed of at their discretion. They harbor elevated expectations and aspirations for their offspring's success.[5] This cultural backdrop has given rise to excessively stringent parenting approaches, including the use of physical punishment.[6,7] According to

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a meta-analysis of 47 studies conducted by Ji and Finkelhor in 2015,[8] in Mainland China, the rate of physical abuse is notably higher at 40.6% compared to the estimated rate in other Chinese societies (19.5%) and the global pooled estimate (17.7%).[7] Numerous research has underscored the correlation between childhood physical abuse and various adverse outcomes in adulthood, such as the formation of secure attachment relationships, diminished self-esteem, and heightened risks of depression and post-traumatic stress symptoms.[9,10]

Childhood Physical Abuse and Depressive Symptoms

Early life stressors, particularly those linked to abuse, have historically been recognized as major contributors to the onset of depression; notably, severe depression exhibits a strong association with childhood physical abuse.[11] According to biological theories, abuse experiences become "biologically embedded" during early development, resulting in stable changes across multiple systems that hinder successful adaptation and response to challenges, consequently leading to adverse mental health outcomes like depression.[12] From a psychosocial perspective, the self-trauma model posits that childhood abuse induces adjustment difficulties through attachment issues, symptoms of post-traumatic stress disorder, maladaptive coping strategies, and negative self and others evaluations, thereby elevating the risk of poor mental health outcomes.[13] Longitudinal studies have shown that experiences of physical maltreatment during late childhood (from 13 years of age and beyond) significantly predict adult depression.[10] More specifically, one meta-analysis revealed that physically maltreated individuals were 2.68 times more likely to develop depression in adulthood.[14] While scholars widely recognize the connection between childhood physical abuse and depressive symptoms in adulthood, the underlying mechanisms remain incompletely understood. Hence, it is imperative to further elucidate potential risk mechanisms between physical abuse and depressive symptoms among Chinese college students, offering more comprehensive evidence for targeted prevention and intervention programs.

The Mediating Role of Alexithymia

The mechanisms underlying the impact of childhood physical abuse on the emergence of depressive symptoms may be partially explained by impairments in emotional awareness and regulation, such as alexithymia. Alexithymia, identified as a personality disorder characterized by difficulty perceiving, identifying, and describing emotions,[15] often arises as a result of early-life psychic trauma that disrupts proper emotional development.[16] This disorder serves as a defensive response to negative emotional experiences, particularly those stemming from traumatic events like childhood abuse.[17] Individuals who have experienced physical abuse during childhood may adopt alexithymia tendencies as a coping mechanism to suppress or avoid distressing emotions associated with their traumatic experiences. By numbing or distancing themselves from their emotions, they attempt to shield themselves from further psychological harm. However, this emotional suppression ultimately impedes their ability to effectively process and express emotions, potentially exacerbating the development of depressive symptoms over time. Research consistently demonstrates that alexithymia is associated with both childhood trauma[18–20] and depression.[19] Furthermore, research has indicated that alexithymia significantly mediated the relationship between childhood trauma and later suicide risk among male prisoners in China.[20] This suggests that alexithymia may serve as a mediator between childhood physical abuse and depressive symptoms.

The Mediating Role of Moral Disengagement

Moral disengagement refers to a cognitive tendency of an individual to redefine his own behavior to minimize harm, reduce his own responsibility and reduce the pain of others.[21] This phenomenon is rooted in social cognitive theory, positing that individuals acquire and internalize cognitive schema, including moral standards, through observational learning and socialization.[22] In the context of childhood physical abuse, physically abused individuals may develop maladaptive coping mechanisms to navigate their experiences, predisposing them to engage in moral disengagement strategies as a means of coping with the resulting cognitive dissonance.[23,24] This cognitive dissonance arises from the conflict between their experiences of abuse and internalized moral standards. Moreover, moral disengagement may interact with various risk factors, such as genetic vulnerability, interpersonal stressors, and environmental stressors, amplifying the risk of developing depressive symptoms in adulthood.[25] Research indicates a strong association between

childhood maltreatment and moral disengagement, with higher levels of maltreatment correlating with increased moral disengagement and subsequent unethical behaviors such as bullying.[23,24] Additionally, family risk factors, such as neglect and abuse from parents, were significantly associated with lower moral awareness, moral judgment, and reduced expected guilt.[26] Notably, previous studies have shown a positive correlation between moral disengagement and feelings of guilt and shame, both of which are known triggers for depression.[27,28] Therefore, understanding moral disengagement as a mediating mechanism between childhood physical abuse and depressive symptoms holds significant implications for research and intervention.

The Serial Mediation of Alexithymia and Moral Disengagement

While alexithymia and moral disengagement may serve as mediators in the link between childhood physical abuse and depressive symptoms, the synergistic effect of both remains inadequately understood. This hampers the comprehensive evaluation of the underlying mechanisms connecting childhood physical abuse and depressive symptoms. Alexithymia, characterized by difficulties in identifying and describing emotions, is linked to impaired processing of moral judgments. Individuals with elevated alexithymia tend to prioritize utilitarian considerations in their judgments as well as exhibit reduced empathic concern compared to those with lower levels of alexithymia,[29,30] all of which may possibly contribute to moral disengagement. Previous studies have identified a significant relationship between alexithymia and moral disengagement, and alexithymia can positively predict moral disengagement of young adults.[31] In this sense, we proposed that alexithymia and moral disengagement sequentially mediate the link between childhood physical abuse and depressive symptoms.

The Moderating Role of Urban–Rural Areas

In addition, researchers have increasingly recognized the significance of urban-rural areas in influencing the aforementioned research variables. According to the cumulative disadvantage theory, children living in resource-poor areas may face multiple challenges that collectively exacerbate their mental health conditions.[32] In rural China, primary challenges include food insecurity, isolation, low income, and abuse.[33] Additionally, rural areas often retain more traditional Confucian values, emphasizing filial piety, family hierarchy, and strict social norms, suggesting higher tolerance for inappropriate parenting behaviors such as corporal punishment.[34] Research indicates that rural students, compared to their urban counterparts, may exhibit a higher incidence of childhood physical abuse[35] and a greater prevalence of depressive symptoms.[36] More important, rural-urban disparities may influence how childhood physical abuse affects college students' cognitive and emotional outcomes. College students living in urban areas typically have higher socioeconomic status, which benefits their development by providing a range of resources such as goods, services, and social relationships.[37] Conversely, rural areas are often underdeveloped, lacking sufficient mental health services and educational infrastructure to address the traumatic effects of childhood physical abuse. Within the framework of cumulative disadvantage theory, rural students who experience childhood physical abuse may be more likely to lack communication with others and social support, leading to more severe depressive symptoms due to deficiencies in emotional expression and cognitive mechanisms.[38,39] Yet, limited research has investigated whether the effect of alexithymia and moral disengagement differ between urban and rural college students. Therefore, further exploration is needed to understand the underlying role of urban-rural areas on the relationship between childhood physical abuse, alexithymia, moral disengagement, and depressive symptoms. This knowledge is crucial for developing interventions that are effectively tailored to the specific needs of these populations.

The Present Study

Childhood physical abuse, alexithymia, moral disengagement, and depressive symptoms are intricately linked, yet the precise nature of their interplay in causing depressive symptoms among college students remains elusive. Drawing from theories of child abuse, our hypotheses are as follows: 1) childhood physical abuse will be positively associated with depressive symptoms. 2) alexithymia will serve as a partial mediator in the relationship between childhood physical abuse and depressive symptoms. 3) moral disengagement will serve as a partial mediator in the relationship between childhood physical abuse and depressive symptoms. 4) alexithymia and moral disengagement will sequentially mediate

the relationship between childhood physical abuse and depressive symptoms. 5) the mediating effects of alexithymia and moral disengagement may differ between rural and urban students.

Material and Methods

Participants and Procedure

The data utilized in this study were gathered from college students in mainland China. Convenient sampling was used to select the eligible respondents. Participants were administered online surveys via the questionnaire platform Wenjuanxing. The participants were briefed on the aims and methods of the study, assured of the confidentiality of their information, made aware that participation was voluntary, and explicitly informed that they had the right to withdraw their consent at any point. The exclusion criteria for participants are: (1) the questionnaire was incomplete; (2) not being a college student; (3) the duration taken to complete the online questionnaire was less than five minutes. 36 college students were excluded whose key variables were missing. Finally, the analysis included 686 college students, with a mean age of 21.33 (*SD* = 2.53), of whom 46.8% were men and 56.6% resided in rural areas (for details, see Table 1). In addition, 90.8% of college students experienced childhood physical abuse, 63.4% experienced mild to severe depressive symptoms, and 37.6% were identified as having alexithymia. The study area encompasses most provinces in China, with Guangdong, Guangxi, and Jiangsu having the highest number of participants. The study design was approved by the Human Research Ethics Committee of [blinded for review].

Instruments

Demographic Information

Demographic details encompassed gender, age, educational level, household income, and residency status.

Table 1 Descriptive Analysis of Sample Characteristics

Sociodemographic Characteristics	*N*	%
Gender		
Male	321	46.8
Female	365	53.2
Age (*M, SD*)	21.33	2.53
Grade		
Freshman	122	17.8
Sophomore	159	23.2
Junior	177	25.8
Senior	128	18.7
Graduate student	100	14.6
Household income		
50,000 and below	274	39.9
60,000 to 100,000	167	24.3
110,000 to 150,000	133	19.4
More than 160,000	112	16.3

(*Continued*)

Table 1 (Continued).

Sociodemographic Characteristics	N	%
Residency status		
Urban	298	43.4
Rural	388	56.6
Childhood physical abuse		
No	63	9.2
Yes	623	90.8
Depressive symptoms		
No	250	36.4
Mild	289	42.1
Moderate	71	10.3
Moderate-severe	25	3.6
Severe	51	7.4
Alexithymia		
No	428	62.4
Yes	258	37.6

Childhood Physical Abuse

The Chinese version of Childhood Trauma Questionnaire's physical abuse subscale was utilized to measure childhood physical abuse.[40,41] The subscale consisted of 5 items. The items are rated on a 5-point scale ranging from 1 (*no such situation*) to 5 (*frequently*), with higher scores represent more childhood physical abuse. Previous research demonstrated that the questionnaire had good reliability and validity in samples of Chinese college students.[42] Cronbach's alpha for the subscale of physical abuse was 0.91 in this study.

Depressive Symptoms

The Chinese version of Patient Health Questionnaire-9 was employed to evaluate symptoms of depression.[43,44] The items are rated on a 4-point scale ranging from 0 (*no such situation*) to 4 (*almost every day*). Cut-offs of 5, 10, 15, and 20 represent mild, moderate, moderately severe, and severe depressive disorder. The questionnaire has been shown to have good reliability and validity in Chinese college student populations.[45] Cronbach's alpha for the Patient Health Questionnaire-9 was 0.92 in this study.

Alexithymia

The Chinese version of Toronto Alexithymia Scale, a 20-item questionnaire, was employed to measure alexithymia.[46,47] It consists of three subscales: Difficulty Describing Feelings (DDF), Difficulty Identifying Feelings (DIF), and Externally Oriented Thinking (EOT). These subdomains offer deeper insights into the individual's alexithymia profile, offering a nuanced comprehension. The items are rated on a 5-point scale ranging from 1(*strongly disagree*) to 5 (*strongly agree*), with higher scores indicating higher alexithymia. The scale has demonstrated strong reliability and validity among Chinese college student populations.[48] Cronbach's alpha for the Childhood Trauma Questionnaire was 0.82 in this study.

Moral Disengagement

The Chinese version of 16-item Moral Disengagement Scale was utilized to assess adolescents' tendency towards moral disengagement.[22,49] A typical item is "If people create or spread fake news online, they should not be held accountable."

This scale comprises 16 items, with each rated on a five-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores reflect a greater degree of moral disengagement. The scale has been demonstrated to be reliable and valid in a sample of Chinese university students.[50] In the present study, the Cronbach's alpha was 0.95.

Data Analysis

Data analysis was conducted using SPSS 22.0 and M*plus* 7.0. To eliminate concerns about common method bias in our survey, we employed Harman's single-factor analysis. Notably, the initial factor explained just 31.90% of the variance, falling well below the threshold of 50% total variance typically associated with significant common method biases. This analysis suggests that our study was not significantly impacted by such biases. First, we summarized the correlations among the variables in our study. Subsequently, we conducted Structural Equation Model (SEM) analyses with M*plus* 7.0 to explore the associations between childhood physical abuse, alexithymia, moral disengagement, and depressive symptoms. Gender and age were included as control variables. Model fit was evaluated using the following fit indices: (a) a χ^2 test, (b) the root mean square error of approximation (RMSEA), (c) the comparative fit index (CFI), (d) Tucker-Lewis index (TLI), (e) root mean square error of approximation (RMSEA), and (f) standardized root mean square residual (SRMR). The following criteria for the model fit were adopted: CFI and TLI > 0.90, and RMSEA and SRMR < 0.08.

In examining moderated mediation, we adopted a multiple group analysis (MGA) method to examine urban-rural area disparities within our model. We followed an iterative, step-by-step approach[51] and contrasted nested models using the Chi-square statistic. Initially, we ran a freely estimated model as the baseline, followed by estimating a fully constrained model where all paths were set equal across urban and rural students. Given that the fully constrained model showed a statistically significant decline in model fit, we continued to constrain paths individually. This allowed us to assess whether each path between variables significantly differed across rural and urban students utilizing the Chi-square difference test in M*plus*. Notably, a significant deterioration in model fit upon constraining a path indicated that those variables should not be assumed to be equal across urban and rural students.[52]

Results

Descriptive Results

Means, standard deviations of variables, and the results of Pearson's correlation are shown in Table 2. Childhood physical abuse was positively correlated with alexithymia (r = 0.39, p < 0.001), moral disengagement (r = 0.66, p < 0.001), and depressive symptoms (r = 0.51, p < 0.001). Furthermore, alexithymia, moral disengagement, and depressive symptoms were all significantly positively correlated (p < 0.001).

Testing for Mediation Effect

SEM analysis revealed that the proposed model exhibited a marginal fit to the data, $\chi^2(2)$ = 16.42, p < 0.01; CFI = 0.99, TLI = 0.96, RMSEA = 0.07, SRMR = 0.03. As indicated in Figure 1, childhood physical abuse was indirectly and positively associated with depressive symptoms through three mediating pathways (childhood physical abuse→ alexithymia → depressive symptoms; childhood physical abuse→ moral disengagement → depressive symptoms; childhood physical abuse→ alexithymia → moral disengagement → depressive symptoms). Moreover, bootstrap analysis of the

Table 2 Descriptive Statistics and Correlations of the Study Variables

Variables	*M*	*SD*	1	2	3	4
1. Childhood physical abuse	7.92	4.54	1			
2. Alexithymia	56.96	11.71	0.39***	1		
3. Moral disengagement	29.20	13.87	0.66***	0.48***	1	
4. Depressive symptoms	16.09	6.04	0.51***	0.51***	0.48***	1

Notes: ***P < 0.001.

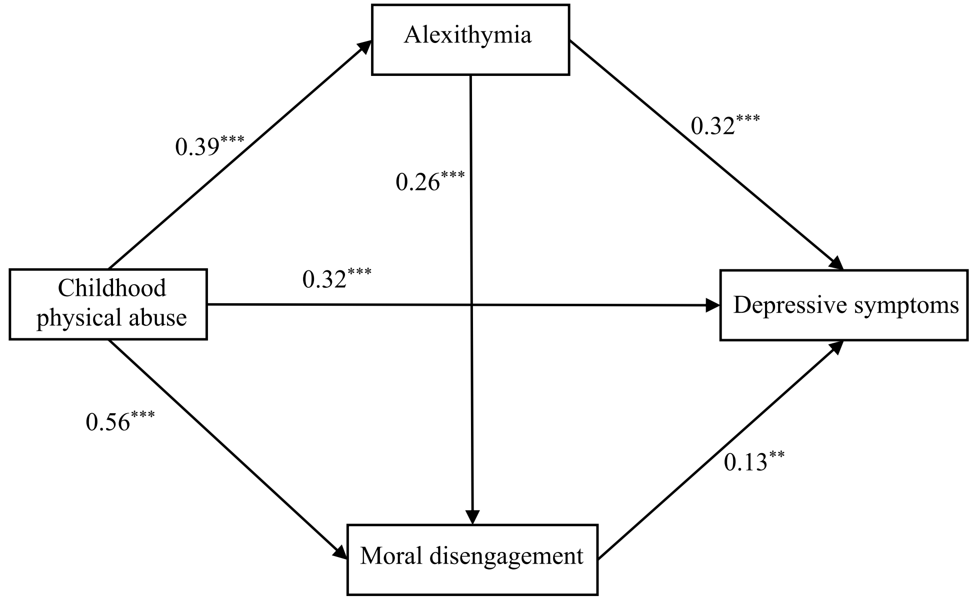

Figure 1 Standardized solutions of the structural model for the entire sample.
Notes: **p < 0.01. ***p < 0.001. For simplicity, control variables are not included in the figure.

total effects indicated a total effect of physical abuse on depressive symptoms of 0.53 (95% CI = [0.44, 0.62]). For the indirect effects, bootstrap testing revealed that the indirect effect of physical abuse on depressive symptoms through alexithymia was 0.13 (95% CI = [0.09, 0.16]), and through moral disengagement was 0.08 (95% CI = [0.02, 0.13]). Finally, the indirect effect of physical abuse on depressive symptoms through both alexithymia and moral disengagement was 0.01 (95% CI = [0.004, 0.03]).

Multigroup Analysis by Urban-Rural Areas

To assess urban-rural disparities, we conducted multiple-group analyses. By restricted equality in path coefficients across urban-rural areas, we found significant differences between the constrained and unconstrained models, $\Delta\chi^2(6) = 22.73$, $p < 0.001$. This suggests that urban-rural areas moderated the chain mediation model. Specifically, as shown in Table 3, the Wald test statistic indicated significant differences in urban-rural areas in the path between alexithymia and

Table 3 Results from Multigroup Analysis Testing for Urban-Rural Area Differences

	B		χ^2	df	$\Delta\chi^2$ (1)	*p* for $\Delta\chi^2$ (1)
	Urban Students	**Rural Students**				
Childhood physical abuse → Alexithymia						
Bs equal for both	0.34***	0.42***	22.92	9		
Bs free to differ	0.40***	0.39***	20.50	8		
					2.45	0.12
Childhood physical abuse → Moral disengagement						
Bs equal for both	0.55***	0.56***	22.50	9		
Bs free to differ	0.51***	0.59***	20.50	8		

(*Continued*)

Table 3 (Continued).

	B		χ^2	df	$\Delta\ \chi^2$ (1)	*p* for $\Delta\ \chi^2$ (1)
	Urban Students	Rural Students				
					1.71	0.157
Childhood physical abuse→ Depressive symptoms						
Bs equal for both	0.31***	0.32***	20.66	9		
Bs free to differ	0.29***	0.33***	20.50	8		
					0.308	0.689
Alexithymia→ Depressive symptoms						
Bs equal for both	0.36***	0.30***	27.88	9		
Bs free to differ	0.26***	0.38***	20.50	8		
					5.376	0.007
Moral disengagement → Depressive symptoms						
Bs equal for both	0.12**	0.12**	20.70	9		
Bs free to differ	0.06*	0.05	20.50	8		
					0.214	0.655
Alexithymia → Moral disengagement						
Bs equal for both	0.30***	0.24***	22.63	9		
Bs free to differ	0.37***	0.26***	20.50	8		
					2.074	0.144

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

depressive symptoms (Wald $\chi^2(1) = 7.38$, $p = 0.007$). Figures 2 and 3 display the standardized path coefficients of the multigroup analyses of the structural model.

Bootstrap testing of the total effects revealed that the total effects of childhood physical abuse on depressive symptoms were stronger among rural students (for urban students, total effect = 0.45, 95% CI = [0.28, 0.60]; for rural students, total effect = 0.57, 95% CI = [0.54, 0.70]). Additionally, bootstrap testing of the indirect effects indicated that the indirect effect of childhood physical abuse on depressive symptoms via alexithymia was stronger among rural students (for urban students, indirect effect = 0.10, 95% CI = [0.06, 0.16]; for rural students, indirect effect = 0.15, 95% CI = [0.13, 0.21]), and similarly, the indirect effect through moral disengagement was only significant among rural students (for urban students, indirect effect = 0.05, 95% CI = [−0.003, 0.03]; for rural students, indirect effect = 0.08, 95% CI = [0.03, 0.16]). Moreover, the indirect effect through alexithymia and moral disengagement was only significant among rural students (for urban students, indirect effect = 0.01, 95% CI = [−0.003, 0.03]; for rural students, indirect effect = 0.02, 95% CI = [0.006, 0.03]).

Discussion

Childhood physical abuse has been linked to a heightened vulnerability to depressive symptoms in adulthood; yet, the mechanisms underlying this association have remained elusive. In this study, we sought to investigate the association between childhood physical abuse and depressive symptoms. To explore this relationship, we employed a moderated mediation model, incorporating alexithymia and moral disengagement as proposed mediators, while also considering urban-rural areas as a hypothesized moderator.

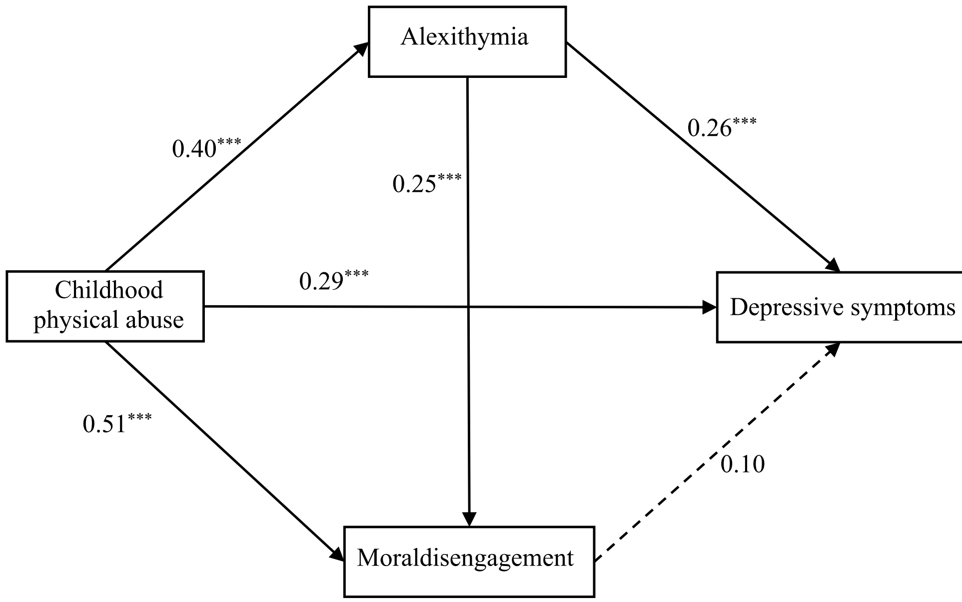

Figure 2 Standardized solutions of the structural model for the urban sample.
Notes: ****p* < 0.001. The dotted line indicates that the path is not significant. For simplicity, control variables are not included in the figure.

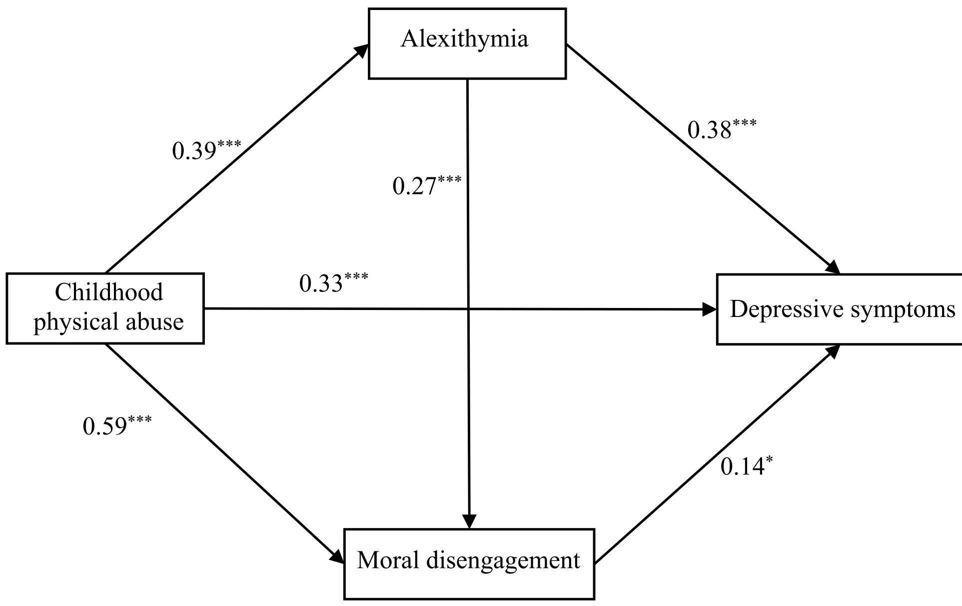

Figure 3 Standardized solutions of the structural model for the rural sample.
Notes: **p* < 0.05. ***p*<0.01. ****p* < 0.001. For simplicity, control variables are not included in the figure.

We first examined the association between childhood physical abuse and depressive symptoms among college students. As anticipated, there was a positive association between childhood physical abuse and depressive symptoms among the college students in our sample. Consistent with our findings, existing cross-sectional and meta-analysis studies have also recognized childhood physical abuse as associated with depressive symptoms in adulthood.[10,14] Childhood physical abuse can lead to severe emotional and psychological distress. The trauma from such abuse interferes with normal cognitive and emotional development, leading to difficulties in managing emotions and forming healthy relationships, which are critical for mental well-being.[1,52] Consequently, the risk of poor mental health outcomes, such as

depressive symptoms, is elevated. The findings underscore the significance of early intervention and preventive efforts aimed at mitigating the enduring consequences of childhood physical abuse on mental health outcomes.

Our results offer empirical evidence that alexithymia mediate the link between childhood physical abuse and depressive symptoms among college students, which was consistent with our expectations and prior studies that found mediating effect of alexithymia in the association of childhood maltreatment with various psychopathology, such as eating disorder.[18] This implies that the impact of childhood physical abuse on adult mental health outcomes is, at least in part, channeled through disruptions in emotional processes. This finding aligns with theoretical frameworks positing that childhood abuse disrupts emotional processing and attachment, leading to the development of alexithymia, which, in turn, increases vulnerability to poor mental health outcomes.[13] Alexithymia may represent a maladaptive coping mechanism in response to early traumatic experiences, serving as a barrier to effective emotion regulation and adaptive coping strategies. The inability to recognize and express emotions may lead to internalized distress, rumination, and interpersonal difficulties, all of which are known risk factors for depression.[53,54] Accordingly, targeting alexithymia in individuals who have experienced childhood physical abuse may represent a promising approach for preventing or ameliorating adult depressive symptoms.

To our knowledge, our study is the first to validate the mediating role of moral disengagement between childhood physical abuse and depressive symptoms among college students. To be specific, childhood physical abuse was associated with high moral disengagement, which in turn was linked to severe depressive symptoms. This can be accounted for by the social cognitive theory. According to social cognitive theory, individuals learn and internalize cognitive schema, including moral standards, through observational learning and socialization processes.[55] Childhood physical abuse can disrupt this developmental trajectory, which may be linked to cognitive distortions and maladaptive coping strategies such as moral disengagement.[56] Consequently, individuals who experience childhood trauma may exhibit heightened susceptibility to depressive symptoms due to the psychological toll of moral disengagement processes.

Our findings indicate that individuals who experience childhood physical abuse may exhibit a higher tendency to engage in moral disengagement. This observation aligns with prior research, which demonstrated a positive association between childhood maltreatment and moral disengagement among Chinese adolescents.[23,24] One plausible explanation is that childhood physical abuse disrupts the development of normative moral beliefs and values, leading individuals to adopt distorted cognitive schema that rationalize or justify their aggressive or harmful behaviors.[57] For instance, children who endure physical abuse may internalize the notion that violence is an acceptable method for resolving conflicts or asserting dominance, thereby facilitating the adoption of moral disengagement strategies. Furthermore, the chronic stress and trauma associated with childhood physical abuse may hinder moral reasoning abilities, making it easier for individuals to morally disengage from their harmful actions. Consequently, childhood physical abuse and moral disengagement are likely to be positively correlated, with higher levels of childhood physical abuse predicting greater engagement in moral disengagement strategies. Moreover, moral disengagement emerged as a cognitive vulnerability associated with an elevated risk of experiencing depressive symptoms in adulthood. Individuals who habitually engage in moral disengagement may experience heightened levels of guilt and shame, as they struggle to reconcile their actions with their moral beliefs.[29,30] These negative affective states can play a role in both the onset and persistence of depressive symptoms, including feelings of sadness, hopelessness, and worthlessness.[29] Therefore, there is likely a positive correlation between moral disengagement and adult depressive symptoms. All these previous findings support the indirect and positive relationships between childhood physical abuse and depressive symptoms via moral disengagement.

Moreover, the present study revealed that childhood physical abuse was positively associated with depressive symptoms through the chain mediation of alexithymia and moral disengagement. The social cognitive theory of moral agency posits that individuals' moral behavior is influenced by cognitive processes, including self-regulatory mechanisms and moral disengagement strategies.[22] Alexithymia may disrupt these processes by impairing individuals' ability to recognize and appropriately respond to emotional cues, thereby increasing reliance on moral disengagement mechanisms to navigate ethical dilemmas. Alexithymia individuals may have difficulty empathizing with others' emotional states, leading to diminished concern for the welfare of others and increased willingness to engage in morally questionable behaviors.[58] Additionally, deficits in emotional awareness may contribute to cognitive biases and distortions that justify

unethical actions as necessary or acceptable.[59] By elucidating the sequential mediation pathway in the Chinese cultural context, the current study underscores the importance of addressing cognitive-affective processes in individuals with a history of abuse. Future research endeavors should continue to explore multifaceted models of mediation and identify targeted interventions to promote psychological well-being among college students.

The final major findings of this study unveiled significant differences between urban and rural areas in the proposed mediation model. Specifically, the indirect effect of moral disengagement on the association between childhood physical abuse and depressive symptoms was significant only among rural students, not urban students. Thus, the mediation model involving moral disengagement appears to be applicable exclusively to rural students. Moreover, the association between alexithymia and depressive symptoms was stronger among rural students. Based on the cumulative disadvantage theory, rural students might face more persistent and compounded disadvantages, such as limited access to mental health resources, lower socioeconomic status, and less social support.[32] These factors exacerbate the impact of childhood physical abuse and increase the likelihood of moral disengagement and subsequent depressive symptoms. Conversely, urban students may have more resources and support systems that mitigate these effects, leading to a non-significant indirect effect in this group. Additionally, parenting differences between rural and urban communities may influence the expression and interpretation of emotional experiences,[60] with rural adolescents often struggling more with alexithymia,[61] worsening their depressive symptoms.[62] The differential association between childhood physical abuse and depressive symptoms highlights the importance of tailoring mental health interventions to address the unique needs of individuals residing in rural and urban areas.

Implications

Our findings have important implications for intervention efforts. First, this study found that childhood physical abuse could increase the risk of college students' depressive symptoms. Mental health interventions for college students should incorporate trauma-informed approaches that recognize the impact of childhood physical abuse on emotional well-being and provide support for recovery. Second, the results indicate that alexithymia may be one mechanism through which college students' experience of childhood physical abuse increases the risk of depressive symptoms. Efforts aimed at enhancing emotional awareness, expression, and regulation skills may help individuals overcome the emotional deficits associated with alexithymia and reduce their vulnerability to depressive symptoms. Third, moral disengagement emerged as a mediator on the association between childhood physical abuse and depressive symptoms. Interventions aimed at reducing depressive symptoms should incorporate strategies to challenge and modify maladaptive cognitive processes associated with moral disengagement. Forth, as our results suggest that the relationship between childhood physical abuse, alexithymia, moral disengagement and depressive symptoms differs by urban-rural areas, targeted mental health support should be implemented. For example, more attention should be given to rural students since the indirect effects of moral disengagement between childhood physical abuse and depressive symptoms are only significant among them.

Limitations and Future Directions

The current results should be interpreted in light of several limitations. Firstly, our study adopted a cross-sectional design, precluding causal inferences. Consequently, caution is warranted in interpreting our findings. Secondly, while alexithymia and moral disengagement partially mediated the relationships between childhood physical abuse and depressive symptoms, other potential mediators warrant investigation. This would help to fully elucidate the internal mechanisms linking childhood physical abuse to depressive symptoms. Such understanding is crucial to inform preventive and intervention strategies for mental health. Additionally, our study sample comprised solely Chinese college students, necessitating further research to ascertain the generalizability of our findings to other demographic groups or populations. Lastly, reliance on self-report questionnaires may introduce biases, such as recall errors or subjective interpretation. To address this, future studies should incorporate both self-report measures and structured interviews to assess childhood physical abuse, alexithymia, moral disengagement, and depressive symptoms comprehensively.

Conclusion

The current study demonstrated a positive association between childhood physical abuse and depressive symptoms among Chinese college students. Our findings revealed that this relationship was partly mediated by alexithymia and moral disengagement. Additionally, alexithymia and moral disengagement had a chain mediating effect on childhood physical abuse and depressive symptoms. Notably, the association between alexithymia and depressive symptoms was more pronounced among rural college students compared to their urban counterparts. Furthermore, the mediation model involving moral disengagement was applicable only to rural college students. Therefore, it is essential to develop tailored interventions focusing on emotional regulation and moral engagement, particularly for rural college students, to effectively address the mental health impact of childhood physical abuse.

Ethics Approval and Informed Consent

All procedures performed in the present study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Ethics approval was obtained from the Human Research Ethics Committee of Zhongkai University of Agriculture and Engineering. Informed consent was obtained from all participants before their participation in the study.

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Disclosure

The authors report no conflicts of interest in this work.

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