

SHORT COMMUNICATION



Roles of mindfulness and depressive symptoms on the association between adverse childhood experiences and non-suicidal self-injury

Guangzhe F. Yuan ^a, Yanping Lu^a, Yuan Tao^{a,b} and Wei Shi^c

^aSichuan Rural Education Development Research Center, School of Education Science, Leshan Normal University, Leshan, People's Republic of China; ^bMental Health Education Center, Leshan Normal University, Leshan, People's Republic of China; ^cInstitute for Disaster Management and Reconstruction (IDMR), Sichuan University, Chengdu, People's Republic of China

ABSTRACT

Background: Prior research has indicated that adverse childhood experiences (e.g. emotional abuse and emotional neglect) may be a contributing factor in the development of non-suicidal self-injury (NSSI) in emerging adulthood. Yet, the data on the potential psychological mechanism underlying adverse childhood experiences and NSSI are limited.

Objective: The objective of this study was to examine the serial mediating roles of mindfulness and depressive symptoms on the relation between emotional abuse and neglect and NSSI.

Method: A cross-sectional design was used in the current study. A sample of 10,839 Chinese youth ($M_{age} = 19.75$, $SD = 1.26$, age range: 15–30 years; 74.9% women) completed online self-report measures assessing childhood emotional trauma, mindfulness, depressive symptoms, and NSSI behaviours.

Results: Structural equation modelling results showed that emotional abuse was negatively related to mindfulness and positively related to depressive symptoms and NSSI. Emotional neglect was negatively related to mindfulness and positively related to depressive symptoms. Mindfulness and depressive symptoms serially mediated the association between emotional abuse and emotional neglect and NSSI.

Conclusions: These findings highlight the complex interplay among childhood emotional trauma, mindfulness, depressive symptoms, and NSSI in adolescents and young adults. While this cross-sectional study identifies potential associations, causal relations cannot be established. Future longitudinal research is needed to determine whether interventions aimed at enhancing mindfulness and reducing depressive symptoms may be effective in reducing the risk of NSSI among individuals with a history of emotional abuse or neglect.

Papel del *mindfulness* y de los síntomas depresivos sobre la asociación entre experiencias adversas infantiles y autolesiones sin fines suicidas

Antecedentes: Investigaciones previas han señalado que las experiencias adversas infantiles (como el abuso y la negligencia emocionales) podrían ser un factor contribuyente para autolesiones sin fines suicidas (ASFS) en la adultez emergente. No obstante, la información sobre los potenciales mecanismos psicológicos subyacentes a la asociación entre las experiencias adversas infantiles y las ASFS son limitadas.

Objetivos: Evaluar el papel de la mediación en serie del *mindfulness* y de los síntomas depresivos en la asociación entre el abuso y la negligencia emocionales sobre las ASFS.

Métodos: En el estudio se empleó un diseño transversal. Una muestra de 10.839 jóvenes chinos (edad promedio = 19,75, desviación estándar = 1,26, rango de edad: 15 a 30 años; 74,9% mujeres) completaron mediciones autorreportadas en línea evaluando el trauma emocional infantil, *mindfulness*, síntomas depresivos y conductas de ASFS.

Resultados: Los resultados del modelo de ecuaciones estructurales mostraron que el abuso emocional presentaba una relación negativa con el *mindfulness* y una relación positiva con los síntomas depresivos y las ASFS. La negligencia emocional se relacionó negativamente con el *mindfulness* y positivamente con los síntomas depresivos. El *mindfulness* y los síntomas depresivos presentaron una mediación en serie para la asociación entre el abuso y la negligencia emocionales y las ASFS.

Conclusiones: Estos hallazgos enfatizan la interrelación compleja entre el trauma emocional infantil, *mindfulness*, síntomas depresivos y ASFS en adolescentes y adultos jóvenes. Si bien este estudio transversal identifica asociaciones potenciales, no es posible establecer relaciones causales. Se necesitan estudios longitudinales a futuro para determinar si las intervenciones que tienen como objetivo el fortalecer el *mindfulness* y reducir los síntomas depresivos podrían ser efectivos para la reducción del riesgo de ASFS en individuos con antecedentes de abuso o negligencia emocionales.

ARTICLE HISTORY

Received 13 October 2024

Revised 22 May 2025

Accepted 12 June 2025

KEYWORDS

Emotional abuse; emotional neglect; mindfulness; depressive symptoms; NSSI

PALABRAS CLAVE

Abuso emocional; negligencia emocional; *mindfulness*; síntomas depresivos; autolesiones sin fines suicidas

HIGHLIGHTS

- Emotional abuse was found to be negatively related to mindfulness and positively related to both depressive symptoms and non-suicidal self-injury (NSSI).
- Emotional neglect showed negative associations with mindfulness and positive associations with depressive symptoms.
- Mindfulness and depressive symptoms serially mediated the relation between both forms of emotional trauma (abuse and neglect) and NSSI.

CONTACT Guangzhe F. Yuan  greatlord@foxmail.com  School of Education Science, Leshan Normal University, No. 778, Binhe Road, Shizhong District, Leshan City, 614000, Sichuan Province, People's Republic of China

© 2025 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group
This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

1. Introduction

Non-suicidal self-injury (NSSI) has emerged as a significant public health concern among youth populations worldwide. NSSI is defined as the deliberate, self-inflicted damage of body tissue without suicidal intent and for purposes not socially sanctioned (Nock, 2010). The prevalence of NSSI among youth ranges from 13.4% to 20% on an international scale (Lucena et al., 2022; Swannell et al., 2014). According to Lucena et al. (2022), several countries reported notably high prevalence rates (above 25%) of self-injurious behaviour in the past year, including New Zealand, Spain, Brazil, the United States, and China. It should be noted that NSSI is associated with several negative outcomes, including an increased risk of suicide attempts, psychiatric disorders, and impaired social functioning (Klonsky et al., 2014). Understanding the psychological mechanisms underlying NSSI development is crucial, given its high prevalence and severe consequences, as this knowledge can directly inform effective prevention and intervention strategies. An examination of potential mediators in the association between risk factors and NSSI can provide valuable insights into the complex pathways that lead to this behaviour (Fox et al., 2015).

Linehan's biosocial model (1993) suggests that an invalidating environment during childhood may contribute to the development of emotion dysregulation and maladaptive coping strategies, such as NSSI. Emotional abuse and emotional neglect represent particularly detrimental forms of childhood maltreatment, with consistent evidence indicating an increased risk of NSSI (R. T. Liu et al., 2018; Serafini et al., 2017). Such experiences may impede the development of adaptive emotion regulation skills, thereby prompting individuals to turn to NSSI as a means of coping with intense emotions (Nock, 2009). Empirical evidence lends support to this theoretical framework, with numerous studies demonstrating robust associations between childhood emotional abuse and neglect and subsequent engagement in NSSI (Gu et al., 2020; Serafini et al., 2017). A comprehensive understanding of this association is essential for the identification of individuals at risk and the development of targeted interventions to prevent or reduce NSSI behaviours.

Mindfulness may serve as an important mediating variable in the relations between childhood trauma (emotional abuse and emotional neglect) and NSSI. This mediational pathway helps explain how early adverse experiences may contribute to later self-injurious behaviours. As defined by Kabat-Zinn (2003), mindfulness is the awareness that emerges through paying attention on purpose, in the present moment, and without judgment to the unfolding of experience. A growing body of evidence supports the conceptualisation of mindfulness as a mediator in trauma-

outcome associations. Research has demonstrated that adverse childhood experiences can impair the development of mindfulness capacities (Brett et al., 2018; Elices et al., 2017; McKeen et al., 2023). According to developmental trauma theory, early emotional abuse and neglect can disrupt the development of self-awareness and attentional control – core components of mindfulness – by creating neurobiological alterations in stress response systems and attention networks (Teicher & Samson, 2016). These developmental disruptions create enduring deficits in mindfulness capabilities, which then affect downstream outcomes. Indeed, studies have demonstrated that childhood maltreatment predicts reduced mindfulness in adolescence and young adulthood (e.g. Gibson, 2024). Those who have experienced childhood emotional abuse or neglect frequently encounter difficulties in emotional awareness, present-moment attention, and non-judgmental acceptance – core mindfulness capacities – and may resort to NSSI as an ineffective coping strategy (Arslan et al., 2024; Daneshmandi et al., 2019; Per et al., 2022).

As a mediating variable, reduced mindfulness capacity resulting from childhood emotional trauma subsequently affects psychological outcomes through several pathways. First, diminished mindfulness impairs regulatory flexibility – the ability to implement and adjust emotion regulation strategies in accordance with situational demands (Bonanno & Burton, 2013). Individuals with a history of childhood emotional trauma often develop rigid and maladaptive coping patterns characterised by low mindfulness and poor regulatory flexibility (Compas et al., 2017). Through promoting present-moment awareness and non-judgmental acceptance, mindfulness facilitates greater regulatory flexibility, enabling individuals to respond to emotional distress adaptively rather than resorting to NSSI (Frewen et al., 2012; Roemer et al., 2015). Second, research consistently demonstrates that mindfulness mediates the association between childhood maltreatment and psychological distress, including depressive symptoms (Arslan et al., 2024; Dolbier et al., 2021). Third, mindfulness-based interventions have demonstrated efficacy in improving mental health outcomes for young people who engage in NSSI (Zheng et al., 2024), further supporting mindfulness as a key role in these pathways.

Furthermore, depressive symptoms may act as a pivotal mediator in the association between childhood emotional abuse and neglect and NSSI. Individuals who have experienced emotional abuse or neglect during childhood are at an elevated risk for developing depressive symptoms in later life (Neumann, 2017). These depressive symptoms, which are typified by persistent sadness, hopelessness, and negative self-perceptions, have the potential to significantly impair an individual's emotional regulation and coping abilities

(Compas et al., 2009). Specifically, depressive symptoms might disrupt emotion regulation through multiple possible pathways: (1) increased rumination, where individuals repetitively focus on negative feelings and their consequences, thus intensifying emotional distress rather than resolving it (Nolen-Hoeksema et al., 2008); (2) negative attentional bias, which preferentially directs cognitive resources toward negative stimuli and limits cognitive flexibility needed for adaptive regulation (Joormann & Gotlib, 2010); (3) diminished positive affect and reward sensitivity, which reduces motivation to engage in adaptive coping strategies (Treadway & Zald, 2011); and (4) depletion of cognitive resources necessary for effective regulation, particularly in executive functions and working memory (Joormann & Vanderlind, 2014). Collectively, these impairments foster reliance on maladaptive regulation strategies, such as avoidance, suppression, and potentially self-injury as a means of immediate emotional relief. Consequently, individuals experiencing depressive symptoms may engage in NSSI as a maladaptive coping mechanism to alleviate emotional distress or to experience any emotion at all (Klonsky, 2007). The extant literature provides substantial evidence of a robust correlation between depressive symptoms and engagement in NSSI (e.g. Barrocas et al., 2015; Wilcox et al., 2012). This correlation, combined with links between childhood emotional trauma and depression, suggests a sequential pathway wherein childhood emotional trauma may first lead to the development of depressive symptoms, which in turn may increase vulnerability to NSSI behaviours.

Given the potential mediating role of depression between childhood trauma and NSSI, it is important to examine factors that might influence depressive symptoms themselves. Research consistently demonstrates that higher levels of mindfulness predicts reduced depressive symptoms (e.g. Johannsen et al., 2022; Reangsing et al., 2021; Strohmaier, 2020). With mindfulness interventions showing efficacy comparable to antidepressants in preventing depression relapse (Kuyken et al., 2016), there is strong theoretical basis for examining mindfulness as an antecedent to depressive symptoms in the following hypothesised model linking childhood emotional trauma to NSSI. In contrast to a moderating role (which would suggest mindfulness alters the strength of the relation between trauma and outcomes), our proposed mediational model posits that childhood emotional trauma operates through mindfulness to affect depression and NSSI, consistent with developmental psychopathology frameworks identifying sequential processes through which early adversity leads to later maladaptive outcomes (Cicchetti & Toth, 2009).

Therefore, based on the aforementioned literature, this study aimed to examine the serial mediating

roles of mindfulness and depressive symptoms on the association between childhood emotional trauma (emotional abuse and emotional neglect) and NSSI. Using a cross-sectional design, we collected data from a large sample of Chinese youth. We hypothesised that: (1) emotional abuse and emotional neglect would be negatively associated with mindfulness; (2) mindfulness would be negatively associated with depressive symptoms; (3) depressive symptoms would be positively associated with NSSI; and (4) emotional abuse and emotional neglect would be indirectly associated with NSSI through the serial mediation of mindfulness and depressive symptoms.

2. Methods

2.1. Participants and procedure

The data presented in this study were derived from a research project that sought to examine the physical and psychological health status of Chinese adolescents and young adults. The participants were recruited from universities and colleges located in the southwest region of China. The participants completed a survey that was uploaded on WenJuanXing (<https://www.wjx.cn/>), a platform that is widely used in China and that has the capacity to yield dependable data. To ensure data quality, two criteria were used to screen for invalid participants: (1) three attention check items were embedded throughout the questionnaire (e.g. 'Mice are larger in size than elephants – YES/NO'), and participants who failed to correctly respond to any of these checks were considered invalid; (2) since the estimated completion time for the entire questionnaire was 10–15 min, we excluded participants who completed the survey in less than 5 min, indicating they may not have read the items carefully. After applying these criteria, we obtained a final valid sample of 10,839 Chinese young people (mean age = 19.75, standard deviation (SD) = 1.26, aged 15–30 years; 74.9% female) was utilised for formal analysis.

The study protocol was subjected to a review and subsequently approved by the Institutional Review Board of the School of Education Science at Leshan Normal University, in accordance with the Declaration of Helsinki. Prior to data collection, participants were provided with a comprehensive explanation of the study's objectives and procedures. Participants were required to meet the following inclusion criteria: (1) age between 15 and 30 years; (2) absence of serious physical or mental illness that would impair participation; (3) ability to fluently understand Chinese; and (4) voluntary participation in the study with signed informed consent. The age range of 15–30 years captures both adolescence and emerging adulthood – developmental periods with heightened NSSI risk (Arnett, 2000; Arslan et al., 2024). This range

encompasses peak onset periods for NSSI (Gandhi et al., 2015; Plener et al., 2015) and aligns with contemporary definitions of youth development that recognise extended transitions to adulthood (Arnett, 2024). No additional exclusion criteria beyond the inverse of these inclusion criteria were applied.

All participants provided electronic informed consent, and they were informed that they could withdraw from the study at any time without consequence. Additionally, the parents or legal guardians of the adolescent participants provided the electronic version of the informed consent. Due to the completely anonymous nature of the data collection process, a formal debriefing procedure was not conducted. However, we provided psychology and mental health resources in the form of recommended books to participants who expressed interest or indicated a need for such materials after completing the survey. Information about accessing mental health services was also made available to all participants.

2.2. Measures

2.2.1. NSSI

The assessment of NSSI was conducted using a modified version of the Deliberate Self-Harm Inventory (DSHI) (Gratz, 2001). Seven NSSI behaviours, previously validated in Chinese populations (Gong et al., 2019; S. Liu et al., 2020), were included in the assessment: self-cutting, burning, scratching, inserting objects under the skin or nails, biting, punching, and head-banging. The frequency of these behaviours was reported by participants over the past year on a four-point Likert scale, with responses ranging from 1 (never) to 4 (six times or more). A composite score was calculated, with higher values indicating greater engagement in NSSI. The internal consistency of this adapted measure was found to be excellent in the current sample (Cronbach's $\alpha = 0.97$).

2.2.2. Emotional abuse and emotional neglect

The assessment of emotional abuse and emotional neglect was conducted using the Chinese short version of the Childhood Trauma Questionnaire (CTQ-SF), which was revised by He et al. (2019). The measure comprises six items, distributed across two dimensions. An illustrative example of an item pertaining to emotional abuse is, 'Someone in my family said hurtful or insulting things to me', whereas an exemplar item concerning emotional neglect is, 'People in my family looked out for each other' (reverse-scored). All three items pertaining to the emotional neglect dimension were reverse-coded. Responses were recorded on a five-point Likert scale, with values ranging from 1 (never) to 5 (very often). Higher total scores are indicative of a greater degree of early emotional trauma. In the present study, the

questionnaire exhibited excellent internal consistency: Cronbach's α for emotional abuse subscale = 0.95, Cronbach's α for emotional neglect subscale = 0.95.

2.2.3. Mindfulness

The assessment of mindfulness was conducted using the Chinese short version of the Five Facet Mindfulness Questionnaire (FFMQ-SF), which was revised by Meng et al. (2020). In this study, the adapted instrument comprises 10 items that assess five dimensions: observing, describing, acting with awareness, non-judging, and non-reactivity. The following sample items illustrate the content of each dimension: 'I am aware of sensations, such as the wind in my hair or the sun on my face' (observing), 'I am adept at articulating my emotions' (describing), 'I engage in actions without conscious awareness' (acting with awareness), 'I tell myself I should not be experiencing the emotions I am experiencing' (non-judging), and 'I observe my emotions without becoming overwhelmed by them' (non-reactivity). Responses were recorded on a five-point Likert scale, with values ranging from 1 (never) to 5 (always). Higher total scores are indicative of elevated levels of mindfulness. The questionnaire exhibited excellent internal consistency in the current study, as indicated by a Cronbach's α coefficient of 0.95.

2.2.4. Depressive symptoms

Depressive symptoms were measured using the depression subscale of the Chinese version of the Depression-Anxiety-Stress Scale (DASS-21), revised by Chen et al. (2023). This subscale consists of seven items, with sample items including 'I found it difficult to work up the initiative to do things' and 'I couldn't seem to experience any positive feeling at all'. Responses were recorded on a 4-point Likert scale ranging from 0 (not at all) to 3 (always). Higher total scores indicate more severe depressive symptoms. In the present study, the subscale demonstrated excellent internal consistency, with a Cronbach's α coefficient of 0.97.

2.3. Data analysis

The data were analyzed using SPSS 23.0 and Amos 24.0. The preliminary assessment of data normality for the primary study variables (i.e. emotional abuse, emotional neglect, mindfulness, depressive symptoms, and NSSI) indicated that the skewness and kurtosis values were within an acceptable range. The web-based survey design ensured complete responses for all items, thereby eliminating concerns regarding missing data.

Descriptive statistics and correlations were calculated for all variables included in the study. The proposed serial mediation model was evaluated using

structural equation modelling (SEM), with latent variables representing each construct. All latent factors were estimated using Maximum Likelihood estimation with robust standard errors (MLR). Age and sex were included in the examined model as covariates. Considering the cross-sectional design in this study, we evaluated an alternative model (emotional abuse and emotional neglect → depressive symptoms → mindfulness → NSSI) and compared its fit indices with our hypothesised model to determine which framework better explained the observed data. The fit of the model was evaluated using several indices, including chi-squared (χ^2), comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardised root mean square residual (SRMR). The model fit was deemed acceptable when the following criteria were met: $\chi^2/df < 5.0$, CFI and TLI > 0.90 , and RMSEA and SRMR < 0.08 (West et al., 2012). The mediation effects were evaluated through bootstrapping with 1,000 replications, resulting in the generation of 95% confidence intervals (CIs) (Muthén, 2010). An indirect effect was deemed statistically significant if the confidence interval did not include zero (Hayes, 2022). A p -value of 0.05 was used to determine statistical significance. All reported results are based on standardised coefficients.

3. Results

3.1. Descriptive findings

The 12-month prevalence of NSSI in the current sample was 20.1%. Table 1 presents the descriptive statistics, including means, standard deviations, and intercorrelations for the primary study variables. Significant associations were observed between emotional abuse, emotional neglect, mindfulness, depressive symptoms, and NSSI. The strength of these correlations was weak-to-strong across all scale scores ($ps < .001$), indicating meaningful associations between the constructs under investigation.

3.2. Mediation results

Subsequently, we evaluated the hypothesised serial mediation model, examining the associations among emotional abuse, emotional neglect, mindfulness, depressive symptoms, and NSSI. Figure 1 illustrates the standardised path coefficients for the proposed model, providing a visual representation of the associations among the variables. The SEM demonstrated an acceptable fit to the data: $\chi^2(358) = 3347.40$, $p < .001$, CFI = 0.99, TLI = 0.99, SRMR = 0.03, RMSEA (90% CI) = 0.028 (0.027–0.029). In this model, emotional abuse was negatively related to mindfulness ($\beta = -.21$, 95% CI $[-.23 \text{ } -.20]$, $p < .001$), positively related

Table 1. Means, standard deviations, and correlations among study variables ($n = 10,839$).

	Table 1. Means, standard deviations, and correlations among study variables (N = 10,657).														
	Total				Female				Male						
	M±SD	1	2	3	4	M±SD	1	2	3	4	M±SD	1	2	3	4
1. Emotional abuse	6.19±3.54	–				5.97±3.40	–				6.83±3.87	–			
2. Emotional neglect	6.44±3.04	.10***	–			6.41±2.99	.15***	–			6.53±3.16	.09***	–		
3. Mindfulness	34.49±8.19	–.19***	–.28***	–		34.16±8.00	–.16***	–.27***	–		35.44±8.66	–.25***	–.31***	–	
4. Depressive symptoms	11.00±5.56	.51***	.09***	–.19***	–	11.95±5.16	.48***	.09***	–.17***	–	13.52±6.17	.50***	.09***	–.25***	–
5. NSSI	8.18±3.60	.33**	.04***	–.14***	.50***	8.01±3.23	.32***	.07***	–.12***	.46***	8.70±4.49	.34***	.05***	–.17***	.47***

Note: NSSI = nonsuicidal self-injury; *** $p < .001$.

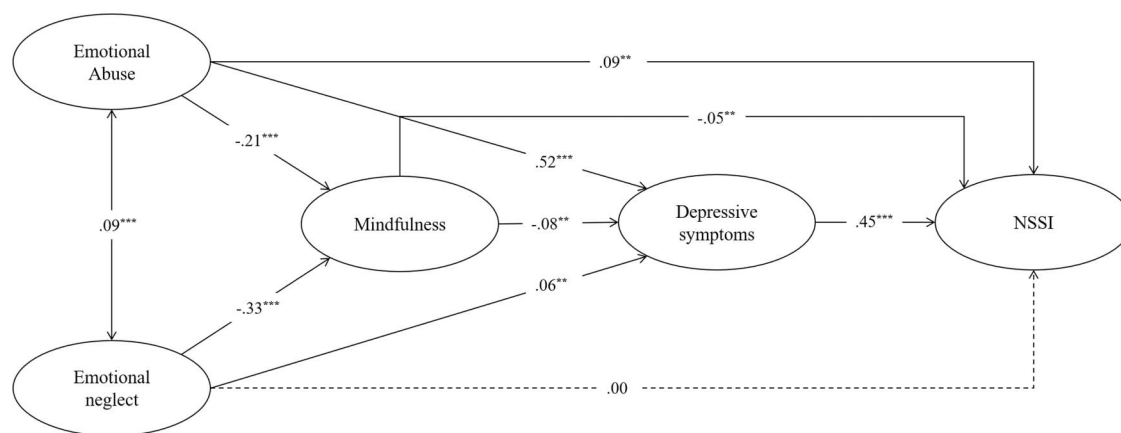


Figure 1. Serial mediation model with standardised coefficients and significance levels added.

Notes: Dashed line represents non-significant path. For simplicity, covariates (age and sex) and factor loadings of all variables are not displayed. NSSI = non-suicidal self-injury; $***p < .001$, $**p < .01$.

to depressive symptoms ($\beta = .52$, 95% CI [.50 –.53], $p < .001$), and positively related to NSSI ($\beta = .09$, 95% CI [.07 –.11], $p < .01$). Emotional neglect was negatively related to mindfulness ($\beta = -.33$, 95% CI [–.35 –.31], $p < .001$), positively related to depressive symptoms ($\beta = .06$, 95% CI [.05 –.09], $p < .01$), while not significantly related to NSSI ($\beta = .00$, 95% CI [–.01 –.02], $p > .05$). Mindfulness was negatively associated with depressive symptoms ($\beta = -.08$, 95% CI [–.11 –.07], $p < .01$) and negatively associated with NSSI ($\beta = -.05$, 95% CI [–.07 –.03], $p < .01$). Depressive symptoms were positively related to NSSI ($\beta = .45$, 95% CI [.43 –.48], $p < .001$). Bootstrapped results indicated that the indirect effects CIs of both serial mediational paths (i.e. emotional abuse $\rightarrow$ mindfulness $\rightarrow$ depressive symptoms $\rightarrow$ NSSI and emotional neglect $\rightarrow$ mindfulness $\rightarrow$ depressive symptoms $\rightarrow$ NSSI) did not include a point estimate of zero. So, these two serial mediating associations were considered statistically significant.

Given that the data is cross-sectional, we tested an alternative model (emotional abuse and emotional neglect $\rightarrow$ depressive symptoms $\rightarrow$ mindfulness $\rightarrow$ NSSI) to compare with the hypothesised model. Results showed that the model fit indices of the hypothesised model were superior to the alternative model: $\chi^2(358) = 5649.07$, CFI = 0.98, TLI = 0.98, SRMR = 0.04, RMSEA (90% CI) = 0.036 (0.035–0.037). In the alternative model, emotional abuse was significantly related to depressive symptoms, mindfulness, and NSSI ($ps < .001$); emotional neglect was significantly related to depressive symptoms and mindfulness ($ps < .001$), yet non-significantly related to NSSI ($p > .05$); depressive symptoms were significantly related to mindfulness ($p < .001$); mindfulness was significantly related to NSSI ($p < .001$). While the alternative model showed some significant associations, we selected the hypothesised model for our analyses because it demonstrated superior fit indices for the observed data.

4. Discussion

To our knowledge, this is the first study to explore the association among adverse childhood experiences (i.e. emotional abuse and neglect), mindfulness, depressive symptoms, and NSSI among Chinese youth. Our findings underscore the importance of addressing adverse childhood emotional experiences and promoting mindfulness to mitigate depressive symptoms and reduce NSSI risk in adolescents and young adults.

The results indicated that mindfulness and depressive symptoms acted as sequential mediators in the association between emotional abuse and NSSI. This finding can be explained by a number of different mechanisms. First, it can be posited that emotional abuse may impair the development of mindfulness skills, as individuals who experience chronic emotional abuse often struggle with present-moment awareness and non-judgmental acceptance (Pepping et al., 2016). A reduction in mindfulness is associated with an increased vulnerability to depressive symptoms, as individuals may experience difficulty in regulating emotions and engaging in adaptive coping strategies (Roemer et al., 2015). Depression is a well-established risk factor for NSSI, potentially serving as a means of emotional regulation or self-punishment (Klonsky et al., 2014). The sequential nature of this mediation implies that emotional abuse precipitates a cascade of psychological consequences. By reducing mindfulness abilities, emotional abuse may indirectly contribute to the development of depressive symptoms, which then increase the likelihood of engaging in NSSI. This pathway is consistent with the experiential avoidance model of deliberate self-harm, which suggests that individuals engage in NSSI as a means of escaping or regulating intense negative emotions (Chapman et al., 2006).

We found that the relation between emotional neglect and NSSI was mediated by mindfulness and depressive symptoms in a sequential manner. One

potential explanation is that emotional neglect during childhood may impede the development of self-awareness and attentional control abilities, which are fundamental aspects of mindfulness (Linehan, 1993). This deficit in mindfulness may result in difficulties in recognising and processing emotions effectively, which may in turn increase vulnerability to depressive symptom (Barnhofer et al., 2016; Grecucci et al., 2015). Subsequently, individuals experiencing depressive symptoms may engage in NSSI as a maladaptive coping mechanism to alleviate emotional distress or to elicit a response to emotional numbness (Zielinski et al., 2017). The sequential nature of this mediation indicates that emotional neglect creates an environment in which mindfulness skills are underdeveloped, thereby increasing susceptibility to depressive symptoms. These depressive symptoms may, in turn, prompt individuals to engage in NSSI as a form of emotional expression or self-punishment. This pathway is consistent with the self-punishment hypothesis of NSSI, which suggests that individuals who have experienced emotional neglect may internalise negative self-perceptions and engage in self-injury as a form of self-directed aggression (Glassman et al., 2007).

The beneficial impact of mindfulness on depressive symptoms operates through several cognitive mechanisms. Mindfulness cultivates nonjudgmental awareness that counteracts negative thinking patterns and self-blame characteristic of depression (Segal & Ferguson, 2018). By fostering present-moment awareness, mindfulness creates distance from rumination, helping individuals recognise negative thoughts as temporary mental events rather than reality (Teasdale et al., 2002). Additionally, mindfulness promotes metacognitive awareness – disrupting cognitive fusion where individuals become overly identified with negative thought content (Bernstein et al., 2019) – and enhances attentional control over negative biases (Koster et al., 2011). These mechanisms help explain how mindfulness attenuates the pathway from childhood emotional trauma to depression in our model.

Interestingly, our results revealed differential mediation patterns for emotional abuse versus emotional neglect. While mindfulness and depressive symptoms fully mediated the relation between emotional neglect and NSSI (evidenced by a non-significant direct path), they only partially mediated the relation between emotional abuse and NSSI (as the direct path remained significant). This pattern may reflect fundamental differences in how these two forms of maltreatment impact psychological development. Emotional neglect – characterised by absence of care and emotional responsiveness – may primarily be associated with NSSI through deficits in emotional awareness and regulation capacities (reflected in lower mindfulness) and subsequent mood disturbances (Tull et al., 2015). In contrast, emotional abuse –

involving active verbal assaults and criticism – may additionally create direct pathways to self-injury through internalised self-criticism, negative self-schemas, and self-punishment motivations that operate somewhat independently from mindfulness and depression (Smith et al., 2017; Xavier et al., 2016). This distinction aligns with theoretical frameworks suggesting that acts of commission (abuse) may create both direct trauma-related pathways and indirect developmental pathways to NSSI, while acts of omission (neglect) may operate primarily through developmental disruptions to emotional regulation capacities (Liu et al., 2018).

It is important to acknowledge that while all pathways in our mediation model were statistically significant (except the direct path from emotional neglect to NSSI), the magnitude of some effects – particularly those involving mindfulness – was relatively small. The path coefficient from mindfulness to depressive symptoms ($\beta = -.08$) and from mindfulness to NSSI ($\beta = -.05$) represent small effects according to conventional standards (Cohen, 2013). These small effect sizes warrant significant caution in interpretation, especially given the cross-sectional nature of our data. Cross-sectional mediation models cannot establish temporal precedence, which is a prerequisite for causal inference (Maxwell & Cole, 2007). As such, our findings should be viewed as identifying potential associations rather than confirming causal mechanisms. This distinction is particularly important when studying risk behaviours like NSSI, where attributing causality could lead to premature or misguided intervention approaches (Kraemer et al., 2001).

However, the interpretation of effect sizes in psychological research, particularly within complex mediation models examining psychopathology, requires careful consideration beyond statistical conventions. As Prentice and Miller (1992) argue, small effect sizes can be theoretically and practically meaningful when they involve difficult-to-influence outcomes, demonstrate persistence over time, or represent cumulative processes. In the context of NSSI – a challenging behaviour influenced by multiple biological, psychological, and social factors – even small protective effects may have clinical significance, especially when they offer potential intervention targets (Kazdin, 1999). Additionally, research on mindfulness-based interventions suggests that statistical effects often underestimate clinical benefits, as even modest improvements in mindfulness can trigger cascading positive changes in emotion regulation and coping that may not be fully captured in cross-sectional models (Khouri et al., 2013; Visted et al., 2015).

It is important to acknowledge the limitations of this study. First, the cross-sectional design precludes the possibility of drawing causal inferences between the variables. Longitudinal studies are required to

establish the temporal associations between childhood emotional trauma, mindfulness, depressive symptoms, and NSSI. Second, the reliance on self-report measures may introduce recall bias, particularly for childhood experiences. Third, although our sample was large, it consisted predominantly of female Chinese youth (around 75%), which may limit the generalizability of the findings to other populations. Future research should employ diverse samples and consider incorporating multi-informant or objective measures to address these limitations.

Despite these limitations, the findings of this study have implications for clinical practice and intervention design with the objective of mitigating the prevalence of NSSI among Chinese youth. Our findings underscore the necessity for prompt identification and intervention for children who have experienced emotional abuse or neglect, as these experiences may predispose them to future mental health difficulties. While the direct effects of mindfulness on both depressive symptoms and NSSI were relatively small in our model, they should be considered within a broader contextual framework. The notably small effect sizes observed in our study, combined with the cross-sectional design, significantly constrain the implications that can be drawn for clinical practice. We must emphasise that our findings do not establish causality and should not be interpreted as direct evidence for specific intervention approaches. Mindfulness-based or culturally-adapted cognitive-behavioral interventions may still be beneficial as part of comprehensive treatment approaches rather than standalone interventions (Khoury et al., 2013; Tao et al., 2025; Yuan et al., 2025; Zhang et al., 2021), but our data alone cannot substantiate this claim. Given the complex, multifaceted nature of NSSI and its risk factors, clinicians should prioritise evidence-based interventions with demonstrated efficacy from controlled trials rather than relying on correlational findings such as ours to guide treatment decisions (Glenn et al., 2019; Nock, 2010).

Although our hypothesised model demonstrated superior fit, the alternative model – specifying a pathway from depression to mindfulness rather than the reverse – also showed significant associations. This suggests mindfulness and depressive symptoms may have a reciprocal association in the pathway between childhood emotional trauma and NSSI. This pattern aligns with evidence that mindfulness can reduce depressive symptoms, while depressive states can also impair mindfulness capacities through negative attentional biases and rumination (Garland & Howard, 2013). Our cross-sectional design cannot disentangle these potentially bidirectional influences.

Our findings may have implications for understanding NSSI in young adults, though we acknowledge the limitations of drawing clinical conclusions

from non-treatment data. The complex interplay observed between childhood experiences, mindfulness, and depressive symptoms suggests hypotheses that could be tested in future clinical research. Given the significant relation observed between depressive symptoms and NSSI, researchers might prioritise investigating interventions directly targeting depression. Future research should examine potential moderators that might influence the relation between mindfulness and NSSI for specific subgroups, as well as investigate whether clinical interventions specifically designed to enhance mindfulness might yield different effects than the naturally occurring variations measured in our study. Additionally, longitudinal studies examining how changes in mindfulness over time relate to depression and NSSI risk could provide more definitive evidence regarding the potential clinical utility of mindfulness-focused approaches. Future studies should examine the potential reciprocal association between mindfulness and depressive symptoms to determine whether these constructs mutually influence each other over time in the pathway from childhood emotional trauma to NSSI. In conclusion, while our findings highlight potential pathways linking childhood emotional trauma to NSSI through mindfulness and depression among Chinese youth, they underscore the need for methodologically rigorous longitudinal and intervention research to establish whether these pathways represent viable targets for prevention and treatment efforts.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

GFY's work was supported by the Foundation of Sichuan Research Center of Applied Psychology (grant number CSXL-24211), Scientific Research Project of Sichuan Rural Digital Education Research Center in Ethnic Areas (grant number MZSJ2004A01), Leshan Normal University Scientific Research Start-up Project for Introducing High-Level Talents (grant number RC2024010), Leshan Normal University Research Cultivation Program (grant number KYPY2025-0008), and Sichuan Province Social Sciences High-level Research Team Building Program. WS's work was supported by the National Natural Science Foundation of China (32200903), Humanities and Social Sciences Youth Foundation, Ministry of Education of China (22YJC190019) and International Visiting Program for Excellent Young Scholars of Sichuan University.

Ethical approval

The Institutional Review Board of School of Education Science, Leshan Normal University approved the protocol and all procedures.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Guangzhe F. Yuan  <http://orcid.org/0000-0001-6145-4020>

References

- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55(5), 469–480. <https://doi.org/10.1037/0003-066X.55.5.469>
- Arnett, J. J. (2024). *Emerging adulthood: The winding road from the late teens through the twenties* (3rd ed.). Oxford University Press, New York. <https://doi.org/10.1093/oso/9780197695937.001.0001>
- Arslan, G., Kabasakal, Z., & Taş, B. (2024). Childhood psychological maltreatment, mindful awareness, self-transcendence, and mental well-being in emerging adults. *Emerging Adulthood*, 12(1), 18–28. <https://doi.org/10.1177/21676968231208246>
- Barnhofer, T., Huntenburg, J. M., Lifshitz, M., Wild, J., Antonova, E., & Margulies, D. S. (2016). How mindfulness training may help to reduce vulnerability for recurrent depression: A neuroscientific perspective. *Clinical Psychological Science*, 4(2), 328–343. <https://doi.org/10.1177/2167702615595036>
- Barrocas, A. L., Giletta, M., Hankin, B. L., Prinstein, M. J., & Abela, J. R. Z. (2015). Nonsuicidal self-injury in adolescence: Longitudinal course, trajectories, and intrapersonal predictors. *Journal of Abnormal Child Psychology*, 43(2), 369–380. <https://doi.org/10.1007/s10802-014-9895-4>
- Bernstein, A., Hadash, Y., & Fresco, D. M. (2019). Metacognitive processes model of decentering: Emerging methods and insights. *Current Opinion in Psychology*, 28, 245–251. <https://doi.org/10.1016/j.copsyc.2019.01.019>
- Bonanno, G. A., & Burton, C. L. (2013). Regulatory flexibility: An individual differences perspective on coping and emotion regulation. *Perspectives on Psychological Science*, 8(6), 591–612. <https://doi.org/10.1177/1745691613504116>
- Brett, E. I., Espeleta, H. C., Lopez, S. V., Leavens, E. L., & Leffingwell, T. R. (2018). Mindfulness as a mediator of the association between adverse childhood experiences and alcohol use and consequences. *Addictive Behaviors*, 84, 92–98. <https://doi.org/10.1016/j.addbeh.2018.04.002> <https://www.sciencedirect.com/science/article/pii/S0306460318302600>
- Chapman, A. L., Gratz, K. L., & Brown, M. Z. (2006). Solving the puzzle of deliberate self-harm: The experiential avoidance model. *Behaviour Research and Therapy*, 44(3), 371–394. <https://doi.org/10.1016/j.brat.2005.03.005>
- Chen, I.-H., Chen, C.-Y., Liao, X., Chen, X., Zheng, X., Tsai, Y.-C., Lin, C.-Y., Griffiths, M. D., & Pakpour, A. H. (2023). Psychometric properties of the Depression, Anxiety, and Stress Scale (DASS-21) among different Chinese populations: A cross-sectional and longitudinal analysis. *Acta Psychologica*, 240, 104042. <https://doi.org/10.1016/j.actpsy.2023.104042>
- Cicchetti, D., & Toth, S. L. (2009). The past achievements and future promises of developmental psychopathology: The coming of age of a discipline. *Journal of Child Psychology and Psychiatry*, 50(1–2), 16–25. <https://doi.org/10.1111/j.1469-7610.2008.01979.x>
- Cohen, J. (2013). *Statistical power analysis for the behavioral sciences* (2nd ed.). Routledge. <https://doi.org/10.4324/9780203771587>
- Compas, B. E., Jaser, S. S., & Benson, M. A. (2009). Coping and emotion regulation: Implications for understanding depression during adolescence. In S. Nolen-Hoeksema & L. M. Hilt (Eds.), *Handbook of depression in adolescents* (pp. 419–440). Routledge/Taylor & Francis Group. https://books.google.com/books?hl=en&lr=&id=hk0nzMdpQr4C&oi=fnd&pg=PA419&dq=depression+emotional+regulation+and+coping+abilities&ots=tQIMqid_YT&sig=uobR_uOmoG_HmFTgXRSFP20oHMY
- Compas, B. E., Jaser, S. S., Bettis, A. H., Watson, K. H., Gruhn, M. A., Dunbar, J. P., Williams, E., & Thigpen, J. C. (2017). Coping, emotion regulation, and psychopathology in childhood and adolescence: A meta-analysis and narrative review. *Psychological Bulletin*, 143(9), 939–991. <https://doi.org/10.1037/bul0000110>
- Daneshmandi, S., Izadikhah, Z., Wilson, L.-A., & Forooshani, S. (2019). Emotional schema therapy improves emotion regulation in individuals with a history of child abuse and neglect. *International Journal of Cognitive Therapy*, 12(1), 5–15. <https://doi.org/10.1007/s41811-018-0036-7>
- Dolbier, C. L., Haley, E. N., Conder, L., & Guiler, W. (2021). Adverse childhood experiences and adult psychopathological symptoms: The moderating role of dispositional mindfulness. *Journal of Contextual Behavioral Science*, 21, 73–79. <https://doi.org/10.1016/j.jcbs.2021.06.001> <https://www.sciencedirect.com/science/article/pii/S2212144721000570>
- Elices, M., Soler, J., Feliu-Soler, A., Carmona, C., Tiana, T., Pascual, J. C., García-Palacios, A., & Álvarez, E. (2017). Combining emotion regulation and mindfulness skills for preventing depression relapse: A randomized-controlled study. *Borderline Personality Disorder and Emotion Dysregulation*, 4(1), 13. <https://doi.org/10.1186/s40479-017-0064-6>
- Fox, K. R., Franklin, J. C., Ribeiro, J. D., Kleiman, E. M., Bentley, K. H., & Nock, M. K. (2015). Meta-analysis of risk factors for nonsuicidal self-injury. *Clinical Psychology Review*, 42, 156–167. <https://doi.org/10.1016/j.cpr.2015.09.002> <https://www.sciencedirect.com/science/article/pii/S0272735815001208>
- Frewen, P. A., Dozois, D. J., Neufeld, R. W., & Lanius, R. A. (2012). Disturbances of emotional awareness and expression in posttraumatic stress disorder: Meta-mood, emotion regulation, mindfulness, and interference of emotional expressiveness. *Psychological Trauma: Theory, Research, Practice, and Policy*, 4(2), 152–161. <https://doi.org/10.1037/a0023114> <https://psycnet.apa.org/record/2011-06112-001>
- Gandhi, A., Luyckx, K., Maitra, S., & Claes, L. (2015). Non-suicidal self-injury and identity distress in Flemish adolescents: Exploring gender differences and mediational pathways. *Personality and Individual Differences*, 82, 215–220. <https://doi.org/10.1016/j.paid.2015.03.031> <https://www.sciencedirect.com/science/article/pii/S0191886915002093>
- Garland, E. L., & Howard, M. O. (2013). Mindfulness-oriented recovery enhancement reduces pain attentional bias in chronic pain patients. *Psychotherapy and Psychosomatics*, 82(5), 311–318. <https://doi.org/10.1159/000348868>
- Gibson, J. (2024). Trauma, early life stress, and mindfulness in adulthood. *BMC Psychology*, 12(1), 71. <https://doi.org/10.1186/s40359-024-01563-6>

- Glassman, L. H., Weierich, M. R., Hooley, J. M., Deliberto, T. L., & Nock, M. K. (2007). Child maltreatment, non-suicidal self-injury, and the mediating role of self-criticism. *Behaviour Research and Therapy*, 45(10), 2483–2490. <https://doi.org/10.1016/j.brat.2007.04.002> <https://www.sciencedirect.com/science/article/pii/S0005796707000824>
- Glenn, C. R., Esposito, E. C., Porter, A. C., & Robinson, D. J. (2019). Evidence base update of psychosocial treatments for self-injurious thoughts and behaviors in youth. *Journal of Clinical Child & Adolescent Psychology*, 48(3), 357–392. <https://doi.org/10.1080/15374416.2019.1591281>
- Gong, T., Ren, Y., Wu, J., Jiang, Y., Hu, W., & You, J. (2019). The associations among self-criticism, hopelessness, rumination, and NSSI in adolescents: A moderated mediation model. *Journal of Adolescence*, 72(1), 1–9. <https://doi.org/10.1016/j.adolescence.2019.01.007>
- Gratz, K. L. (2001). Measurement of deliberate self-harm: Preliminary data on the deliberate self-harm inventory. *Journal of Psychopathology and Behavioral Assessment*, 23(4), 253–263. <https://doi.org/10.1023/A:1012779403943>
- Grecucci, A., Pappaianni, E., Siugzdaite, R., Theuninck, A., & Job, R. (2015). Mindful emotion regulation: Exploring the neurocognitive mechanisms behind mindfulness. *BioMed Research International*, 2015, 1–9. <https://doi.org/10.1155/2015/670724>
- Gu, H., Ma, P., & Xia, T. (2020). Childhood emotional abuse and adolescent nonsuicidal self-injury: The mediating role of identity confusion and moderating role of rumination. *Child Abuse & Neglect*, 106, 104474. <https://doi.org/10.1016/j.chiabu.2020.104474> <https://www.sciencedirect.com/science/article/pii/S0145213420301290>
- Hayes, A. F. (2022). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (3rd ed.). The Guilford Press.
- He, J., Zhong, X., Gao, Y., Xiong, G., & Yao, S. (2019). Psychometric properties of the Chinese version of the childhood trauma questionnaire-short form (CTQ-SF) among undergraduates and depressive patients. *Child Abuse & Neglect*, 91, 102–108. <https://doi.org/10.1016/j.chiabu.2019.03.009>
- Johannsen, M., Nissen, E. R., Lundorff, M., & O'Toole, M. S. (2022). Mediators of acceptance and mindfulness-based therapies for anxiety and depression: A systematic review and meta-analysis. *Clinical Psychology Review*, 94, 102156. <https://doi.org/10.1016/j.cpr.2022.102156> <https://www.sciencedirect.com/science/article/pii/S0272735822000411>
- Joormann, J., & Gotlib, I. H. (2010). Emotion regulation in depression: Relation to cognitive inhibition. *Cognition and Emotion*, 24(2), 281–298. <https://doi.org/10.1080/02699930903407948>
- Joormann, J., & Vanderlind, W. M. (2014). Emotion regulation in depression: The role of biased cognition and reduced cognitive control. *Clinical Psychological Science*, 2(4), 402–421. <https://doi.org/10.1177/2167702614536163>
- Kabat-Zinn, J. (2003). *Mindfulness-based interventions in context: Past, present, and future*. <https://psycnet.apa.org/record/2003-03824-002>
- Kazdin, A. E. (1999). The meanings and measurement of clinical significance. *Journal of Consulting and Clinical Psychology*, 67(3), 332–339. <https://doi.org/10.1037/0022-006X.67.3.332>
- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., Chapleau, M.-A., Paquin, K., & Hofmann, S. G. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review*, 33(6), 763–771. <https://doi.org/10.1016/j.cpr.2013.05.005>
- Klonsky, E. D. (2007). The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review*, 27(2), 226–239. <https://doi.org/10.1016/j.cpr.2006.08.002>
- Klonsky, E. D., Victor, S. E., & Saffer, B. Y. (2014). Nonsuicidal self-injury: What we know, and what we need to know. *The Canadian Journal of Psychiatry*, 59(11), 565–568. <https://doi.org/10.1177/070674371405901101>
- Koster, E. H. W., De Lissnyder, E., Derakshan, N., & De Raedt, R. (2011). Understanding depressive rumination from a cognitive science perspective: The impaired disengagement hypothesis. *Clinical Psychology Review*, 31(1), 138–145. <https://doi.org/10.1016/j.cpr.2010.08.005>
- Kraemer, H. C., Stice, E., Kazdin, A., Offord, D., & Kupfer, D. (2001). How do risk factors work together? Mediators, moderators, and independent, overlapping, and proxy risk factors. *American Journal of Psychiatry*, 158(6), 848–856. <https://doi.org/10.1176/appi.ajp.158.6.848>
- Kuyken, W., Warren, F. C., Taylor, R. S., Whalley, B., Crane, C., Bondolfi, G., Hayes, R., Huijbers, M., Ma, H., Schweizer, S., Segal, Z., Speckens, A., Teasdale, J. D., Van Heeringen, K., Williams, M., Byford, S., Byng, R., & Dalgleish, T. (2016). Efficacy of mindfulness-based cognitive therapy in prevention of depressive relapse: An individual patient data meta-analysis from randomized trials. *JAMA Psychiatry*, 73(6), 565–574. <https://doi.org/10.1001/jamapsychiatry.2016.0076> <https://jamanetwork.com/journals/jamapsychiatry/article-abstract/2517515>
- Linehan, M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. Guilford press. [https://books.google.com/books?hl=en&lr=&id=UZim3OAPwe8C&oi=fnd&pg=PA3&dq=Linehan,+M.+M.+\(1993\).+Cognitive-behavioral+treatment+of+borderline+personality+disorder&ots=qERx4s_uG8&sig=ml-T5jTErUuedEeMI2lIOWouftQ](https://books.google.com/books?hl=en&lr=&id=UZim3OAPwe8C&oi=fnd&pg=PA3&dq=Linehan,+M.+M.+(1993).+Cognitive-behavioral+treatment+of+borderline+personality+disorder&ots=qERx4s_uG8&sig=ml-T5jTErUuedEeMI2lIOWouftQ)
- Liu, R. T., Scopelliti, K. M., Pittman, S. K., & Zamora, A. S. (2018). Childhood maltreatment and non-suicidal self-injury: A systematic review and meta-analysis. *The Lancet Psychiatry*, 5(1), 51–64. [https://doi.org/10.1016/S2215-0366\(17\)30469-8](https://doi.org/10.1016/S2215-0366(17)30469-8) [https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366\(17\)30469-8/abstract](https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366(17)30469-8/abstract)
- Liu, S., You, J., Ying, J., Li, X., & Shi, Q. (2020). Emotion reactivity, nonsuicidal self-injury, and regulatory emotional self-efficacy: A moderated mediation model of suicide ideation. *Journal of Affective Disorders*, 266, 82–89. <https://doi.org/10.1016/j.jad.2020.01.083>
- Lucena, N. L., Rossi, T. A., Azevedo, L. M. G., & Pereira, M. (2022). Self-injury prevalence in adolescents: A global systematic review and meta-analysis. *Children and Youth Services Review*, 142, 106634. <https://doi.org/10.1016/j.childyouth.2022.106634>
- Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analyses of longitudinal mediation. *Psychological Methods*, 12(1), 23–44. <https://doi.org/10.1037/1082-989X.12.1.23>
- McKeen, H., Hook, M., Podduturi, P., Beitzell, E., Jones, A., & Liss, M. (2023). Mindfulness as a mediator and moderator in the relationship between adverse childhood experiences and depression. *Current Psychology*, 42(8), 6576–6586. <https://doi.org/10.1007/s12144-021-02003-z>
- Meng, Y., Mao, K., & Li, C. (2020). Validation of a short-form five facet mindfulness questionnaire instrument in China. *Frontiers in Psychology*, 10, 3031. <https://doi.org/10.3389/fpsyg.2019.03031>
- Muthén, L. K. (2010). *Mplus user's guide: Muthén & Muthén: Los Angeles. Mplus User's Guide, (Muthén & Muthén, Los Angeles).*

- Neumann, E. (2017). Recollections of emotional abuse and neglect in childhood as risk factors for depressive disorders and the need for psychotherapy in adult life. *The Journal of Nervous and Mental Disease*, 205(11), 873–878. <https://doi.org/10.1097/NMD.0000000000000748> https://journals.lww.com/jonmd/FullText/2017/11000/Recollections_of_Emotional_Abuse_and_Neglect_in.7.aspx
- Nock, M. K. (2009). Why do people hurt themselves? New insights into the nature and functions of self-injury. *Current Directions in Psychological Science*, 18(2), 78–83. <https://doi.org/10.1111/j.1467-8721.2009.01613.x>
- Nock, M. K. (2010). Self-Injury. *Annual Review of Clinical Psychology*, 6(1), 339–363. <https://doi.org/10.1146/annurev.clinpsy.121208.131258>
- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science*, 3(5), 400–424. <https://doi.org/10.1111/j.1745-6924.2008.00088.x>
- Pepping, C. A., Duvenage, M., Cronin, T. J., & Lyons, A. (2016). Adolescent mindfulness and psychopathology: The role of emotion regulation. *Personality and Individual Differences*, 99, 302–307. <https://doi.org/10.1016/j.paid.2016.04.089> <https://www.sciencedirect.com/science/article/pii/S019188691630349X>
- Per, M., Simundic, A., Argento, A., Khoury, B., & Heath, N. (2022). Examining the relationship between mindfulness, self-compassion, and emotion regulation in self-injury. *Archives of Suicide Research*, 26(3), 1286–1301. <https://www.tandfonline.com/doi/abs/10.1080/13811118.2021.1885534>
- Plener, P. L., Schumacher, T. S., Munz, L. M., & Groschwitz, R. C. (2015). The longitudinal course of non-suicidal self-injury and deliberate self-harm: A systematic review of the literature. *Borderline Personality Disorder and Emotion Dysregulation*, 2(1), 2. <https://doi.org/10.1186/s40479-014-0024-3>
- Prentice, D. A., & Miller, D. T. (1992). When small effects are impressive. *Psychological Bulletin*, 112(1), 160–164. <https://doi.org/10.1037/0033-2909.112.1.160>
- Reangsing, C., Rittiwong, T., & Schneider, J. K. (2021). Effects of mindfulness meditation interventions on depression in older adults: A meta-analysis. *Aging & Mental Health*, 25(7), 1181–1190. <https://doi.org/10.1080/13607863.2020.1793901>
- Roemer, L., Williston, S. K., & Rollins, L. G. (2015). Mindfulness and emotion regulation. *Current Opinion in Psychology*, 3, 52–57. <https://doi.org/10.1016/j.copsyc.2015.02.006> <https://www.sciencedirect.com/science/article/pii/S2352250X15000974>
- Segal, Z. V., & Ferguson, A. M. (2018). Mindfulness-based cognitive therapy: Treatment development from a common cognitive therapy core. In R. L. Leahy (Ed.), *Science and practice in cognitive therapy: Foundations, mechanisms, and applications* (pp. 159–174). The Guilford Press.
- Serafini, G., Canepa, G., Adavastro, G., Nebbia, J., Belvederi Murri, M., Erbutto, D., Pocai, B., Fiorillo, A., Pompili, M., Flouri, E., & Amore, M. (2017). The relationship between childhood maltreatment and non-suicidal self-injury: A systematic review. *Frontiers in Psychiatry*, 8, 149. <https://doi.org/10.3389/fpsy.2017.00149>
- Smith, K. E., Hayes, N. A., Styer, D. M., & Washburn, J. J. (2017). Emotional reactivity in a clinical sample of patients with eating disorders and nonsuicidal self-injury. *Psychiatry Research*, 257, 519–525. <https://doi.org/10.1016/j.psychres.2017.08.014> <https://www.sciencedirect.com/science/article/pii/S0165178117302305>
- Strohmaier, S. (2020). The relationship between doses of mindfulness-based programs and depression, anxiety, stress, and mindfulness: A dose-response meta-regression of randomized controlled trials. *Mindfulness*, 11(6), 1315–1335. <https://doi.org/10.1007/s12671-020-01319-4>
- Swannell, S. V., Martin, G. E., Page, A., Hasking, P., & St John, N. J. (2014). Prevalence of nonsuicidal self-injury in non-clinical samples: Systematic review, meta-analysis and meta-regression. *Suicide and Life-Threatening Behavior*, 44(3), 273–303. <https://doi.org/10.1111/sltb.12070>
- Tao, Y., Lu, Y., Shi, W., & Yuan, G. F. (2025). Multidimensional diagnostic features and intervention pathways for youth mental disorders in China's involution society. *Asian Journal of Psychiatry*, 108, 104531. <https://doi.org/10.1016/j.ajp.2025.104531>
- Teasdale, J. D., Moore, R. G., Hayhurst, H., Pope, M., Williams, S., & Segal, Z. V. (2002). Metacognitive awareness and prevention of relapse in depression: Empirical evidence. *Journal of Consulting and Clinical Psychology*, 70(2), 275–287. <https://doi.org/10.1037/0022-006X.70.2.275>
- Teicher, M. H., & Samson, J. A. (2016). Annual research review: Enduring neurobiological effects of childhood abuse and neglect. *Journal of Child Psychology and Psychiatry*, 57(3), 241–266. <https://doi.org/10.1111/jcpp.12507>
- Treadway, M. T., & Zald, D. H. (2011). Reconsidering anhedonia in depression: Lessons from translational neuroscience. *Neuroscience & Biobehavioral Reviews*, 35(3), 537–555. <https://doi.org/10.1016/j.neubiorev.2010.06.006>
- Tull, M. T., Bardeen, J. R., DiLillo, D., Messman-Moore, T., & Gratz, K. L. (2015). A prospective investigation of emotion dysregulation as a moderator of the relation between posttraumatic stress symptoms and substance use severity. *Journal of Anxiety Disorders*, 29, 52–60. <https://doi.org/10.1016/j.janxdis.2014.11.003> <https://www.sciencedirect.com/science/article/pii/S0887618514001674>
- Visted, E., Vøllestad, J., Nielsen, M. B., & Nielsen, G. H. (2015). The impact of group-based mindfulness training on self-reported mindfulness: A systematic review and meta-analysis. *Mindfulness*, 6(3), 501–522. <https://doi.org/10.1007/s12671-014-0283-5>
- West, S. G., Taylor, A. B., & Wu, W. (2012). Model fit and model selection in structural equation modeling. In R. H. Hoyle (Ed.), *Handbook of structural equation modeling* (pp. 209–231). Guilford.
- Wilcox, H. C., Arria, A. M., Caldeira, K. M., Vincent, K. B., Pinchevsky, G. M., & O'Grady, K. E. (2012). Longitudinal predictors of past-year non-suicidal self-injury and motives among college students. *Psychological Medicine*, 42(4), 717–726. <https://doi.org/10.1017/S0033291711001814>
- Xavier, A., Pinto Gouveia, J., & Cunha, M. (2016). Non-suicidal self-injury in adolescence: The role of shame, self-criticism and fear of self-compassion. *Child & Youth Care Forum*, 45(4), 571–586. <https://doi.org/10.1007/s10566-016-9346-1>
- Yuan, G. F., Zhong, S., Liu, C., Liu, J., & Yu, J. (2025). The influence of family resilience on non-suicidal self-injury among Chinese adolescents: The mediating roles of mindfulness and individual resilience. *Archives of Psychiatric Nursing*, 54, 46–53. <https://doi.org/10.1016/j.apnu.2025.01.003>
- Zhang, D., Lee, E. K., Mak, E. C., Ho, C. Y., & Wong, S. Y. (2021). Mindfulness-based interventions: An overall review. *British Medical Bulletin*, 138(1), 41–57. <https://doi.org/10.1093/bmb/ldab005> <https://academic.oup.com/bmb/article-abstract/138/1/41/6244773>

- Zheng, Q., Zhou, H.-Y., Li, K., Liu, Y., Nan, W., & Gong, J. (2024). The effectiveness of mindfulness-based intervention for psychological distress and emotion regulation in college students with non-suicidal self-injury. *Applied Psychology: Health and Well-Being*, 16(4), 2083–2098. <https://doi.org/10.1111/aphw.12580>
- Zielinski, M. J., Veilleux, J. C., Winer, E. S., & Nadorff, M. R. (2017). A short-term longitudinal examination of the relations between depression, anhedonia, and self-injurious thoughts and behaviors in adults with a history of self-injury. *Comprehensive Psychiatry*, 73, 187–195. <https://doi.org/10.1016/j.comppsy.2016.11.013> <https://www.sciencedirect.com/science/article/pii/S0010440X1630222X>