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The Relationship Between Childhood Adversity and Cognitive Flexibility The Moderating Role of Mindfulness

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A B S T R A C T

This study aimed to investigate the relationship between childhood adversity and cognitive flexibility, and to examine the moderating role of mindfulness in this relationship. The study employed a descriptive correlational design and was conducted with a sample of 380 adult participants from Thunder Bay, selected based on the Morgan and Krejcie table. Standardized tools were used to measure the variables: the Cognitive Flexibility Inventory (CFI) to assess cognitive flexibility, the Five Facet Mindfulness Questionnaire (FFMQ) to assess mindfulness, and the Childhood Trauma Questionnaire–Short Form (CTQ-SF) to measure childhood adversity. Data were analyzed using SPSS-27 for descriptive statistics and Pearson correlation, and AMOS-21 for structural equation modeling (SEM). Model fit indices and path coefficients were used to evaluate the direct, indirect, and total effects of the variables within the proposed model. Pearson correlation analysis revealed that cognitive flexibility was significantly positively correlated with mindfulness ($r = .59$, $p < .001$) and significantly negatively correlated with childhood adversity ($r = –.44$, $p < .001$). Additionally, mindfulness was negatively associated with childhood adversity ($r = –.36$, $p < .001$). Structural equation modeling confirmed that the proposed model had a good fit ($\chi^2/df = 1.78$, RMSEA = 0.044, CFI = 0.96, TLI = 0.95). Direct path analysis showed that childhood adversity had a significant negative effect on cognitive flexibility ($\beta = –0.36$, $p < .001$) and mindfulness ($\beta = –0.39$, $p < .001$), while mindfulness had a significant positive effect on cognitive flexibility ($\beta = 0.48$, $p < .001$). The indirect effect of childhood adversity on cognitive flexibility through mindfulness was also significant ($\beta = –0.19$, $p < .001$), indicating partial mediation. The total effect of childhood adversity on cognitive flexibility was strong and negative ($\beta = –0.55$, $p < .001$). The findings suggest that mindfulness plays a critical buffering role in preserving cognitive flexibility among individuals with a history of childhood adversity, highlighting the potential value of mindfulness-based interventions in promoting cognitive and emotional resilience.

Keywords: *Childhood adversity, Cognitive flexibility, Mindfulness*

1. Introduction

Childhood adversity has increasingly been recognized as a powerful determinant of psychological and cognitive functioning throughout the lifespan. Experiences such as abuse, neglect, and household dysfunction—often categorized under Adverse Childhood Experiences (ACEs)—have been associated with a wide range of long-term consequences including emotional dysregulation, psychopathology, and neurocognitive impairment (Dolbier et al., 2021). Among these consequences, impairments in cognitive flexibility—the capacity to adapt thinking and behavior in response to changing goals and environmental demands—have emerged as a particularly salient outcome of early trauma (Kalia et al., 2021). Cognitive flexibility plays a critical role in executive functioning and emotional regulation, and deficits in this domain may compromise an individual's ability to manage stress, solve problems adaptively, and maintain psychological resilience (Wei et al., 2019).

A growing body of literature supports the connection between childhood adversity and reduced cognitive flexibility. Neurodevelopmental studies have shown that early exposure to stress alters brain structures associated with executive functioning, such as the prefrontal cortex and anterior cingulate cortex (Choi et al., 2023). These structural and functional changes are thought to underlie persistent difficulties in flexible thinking observed in both clinical and non-clinical populations with histories of adversity (Johnson, 2022). Cognitive rigidity, in turn, may exacerbate susceptibility to mental health issues such as anxiety, depression, and maladaptive coping strategies (Kalia et al., 2020). The findings by Bashir and Majeed (2023) further illustrate how cognitive inflexibility mediates the association between adverse experiences and academic and emotional functioning in adolescents (Bashir & Majeed, 2023).

This relationship between adversity and cognitive function is not limited to childhood or adolescence. Longitudinal and lifespan research has identified persistent effects of early trauma on cognition into adulthood and older age. For example, Manavbasi and Stine-Morrow (2024) discuss how early-life adversity affects cognitive aging trajectories, often accelerating cognitive decline and undermining adaptive reasoning skills (Manavbasi & Stine-Morrow, 2024). These findings are echoed in meta-analytic research by Rahapsari and Levita (2024), who report consistent negative associations between childhood adversity and various domains of cognitive control, including working memory and cognitive flexibility (Rahapsari & Levita, 2024). Similarly, Künzi et al. (2022) emphasize that cumulative life course adversity adversely affects both mental health and executive function, further validating the enduring impact of early negative experiences (Künzi et al., 2022).

In response to these risks, researchers have begun to explore protective factors that may mitigate the cognitive and psychological consequences of early adversity. One such factor is dispositional mindfulness, defined as the capacity to attend to present-moment experiences with openness, curiosity, and nonjudgment (McKeen et al., 2021). Mindfulness has been proposed as a moderator that can buffer the harmful effects of trauma on cognitive functioning (Beshai & Parmar, 2019). Dolbier et al. (2021) demonstrated that individuals with high levels of dispositional mindfulness reported fewer psychopathological symptoms despite high levels of childhood adversity, highlighting its regulatory potential in emotional and cognitive domains (Dolbier et al., 2021). Likewise, Kalia et al. (2020) found that emotion regulation strategies mediated the association between ACEs and stress perception, with implications for cognitive flexibility (Kalia et al., 2020).

Further supporting the moderating role of mindfulness, Yamin (2025) revealed that mindfulness significantly reduced the severity of physical and psychological symptoms in individuals with chronic conditions who also had a history of childhood abuse (Yamin, 2025). This aligns with findings from Kong and Jang (2024), who emphasized that mindfulness enhances cognitive flexibility by enabling practitioners to disengage from habitual patterns of thought and behavior, thereby promoting adaptive coping (Kong & Jang, 2024). Moreover, studies like that of Li et al. (2022) show that mindfulness not only buffers negative emotional responses but also directly supports executive functioning, even in the face of adversity (Li et al., 2022).

The specific mechanism by which mindfulness influences cognitive flexibility remains an area of active investigation. Lee and Chae (2024) suggest that mindfulness enhances socio-cognitive capacities, such as emotional intelligence, which in turn improve creative and flexible thinking (Lee & Chae, 2024). Similarly, Yule and Grych (2023) argue that mindful caregiving enhances children's reflective functioning, which is foundational to cognitive and emotional adaptability (Yule & Grych, 2023). Rodríguez et al. (2021) extend these ideas to clinical populations, noting

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that trauma-informed mindfulness practices improve both neurocognitive and social-cognitive outcomes among individuals with severe psychiatric conditions (Rodríguez et al., 2021).

Cognitive flexibility is not merely a cognitive capacity but also a socio-emotional competence influenced by environmental and developmental factors. Kazerooni and Gholamipour (2023) underscore this point by demonstrating that cognitive flexibility moderates the impact of childhood maltreatment on emotion regulation difficulties in adolescents, suggesting its vital role in adaptive emotional functioning (Kazerooni & Gholamipour, 2023). In a similar vein, Kotera and Rhodes (2019) found that individuals with greater cognitive flexibility were more likely to exhibit healthy interpersonal behaviors, despite a background of adverse experiences (Kotera & Rhodes, 2019). These findings suggest that interventions aimed at enhancing mindfulness and cognitive flexibility may hold promise for individuals at risk due to early trauma.

Nonetheless, the relationship between adversity and cognitive outcomes is complex and often influenced by sociocultural and individual differences. Mongale and Amone-P'Olak (2020) highlight how family environment during childhood significantly predicts depression and cognitive impairments in early adulthood in non-Western contexts, emphasizing the importance of culturally sensitive research (Mongale & Amone-P'Olak, 2020). Similarly, Kalia et al. (2021) found consistent reductions in cognitive flexibility among both college students and community members exposed to ACEs, across different cultural settings (Kalia et al., 2021). This growing cross-cultural evidence points to the need for localized studies that examine these psychological constructs within specific populations, such as Canadian adults.

In a recent narrative review, Zamir et al. (2023) noted significant gaps in psychological intervention strategies for individuals suffering from trauma-related cognitive disruptions, especially in non-clinical and community-based samples (Zamir et al., 2023). The lack of comprehensive models that integrate mindfulness and cognitive flexibility as interacting variables further complicates the field's understanding of resilience pathways. Zhou et al. (2024) attempted to address this by testing a mediation model in which cognitive flexibility and habitual thinking patterns mediated the link between childhood adversity and mind-wandering. Their findings reinforced the view that cognitive and attentional mechanisms are deeply affected by early trauma, and can be altered through targeted psychological interventions (Zhou et al., 2024).

Despite these advances, few studies have explicitly examined the moderating role of mindfulness in the relationship between childhood adversity and cognitive flexibility. Moreover, limited research has tested this relationship using structural models that allow for the exploration of direct and interactive effects. In addition, there is a notable gap in the literature regarding Canadian populations, where cultural, familial, and educational contexts may uniquely shape the development of cognitive and emotional capacities following adversity. The present study aims to address these gaps by examining the relationship between childhood adversity and cognitive flexibility in a sample of adults residing in Thunder Bay, with mindfulness considered as a potential moderating factor.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a descriptive correlational research design to examine the relationship between childhood adversity and cognitive flexibility, with mindfulness as a potential moderating variable. The statistical population consisted of adult individuals residing in Thunder Bay. Based on the Morgan and Krejcie (1970) sample size determination table, a sample of 380 participants was deemed sufficient for the analysis. Participants were selected through a convenience sampling method, ensuring voluntary participation and informed consent. Inclusion criteria required participants to be at least 18 years old, have the ability to read and write in Persian, and provide informed consent to complete the questionnaires. All ethical considerations, including confidentiality and anonymity, were strictly observed throughout the study.

2.2. Measures

2.2.1. Cognitive Flexibility

To assess the dependent variable of cognitive flexibility, the Cognitive Flexibility Inventory (CFI) developed by Dennis and Vander Wal (2010) was used. This self-report inventory is designed to measure individuals' ability to shift thoughts and adapt to changing situational demands. The CFI consists of 20 items and includes two subscales: "Alternatives," which evaluates the ability to consider multiple alternative explanations for events and responses,

and "Control," which measures the tendency to perceive difficult situations as controllable. Items are scored on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree), with higher scores indicating greater cognitive flexibility. The psychometric properties of the CFI have been confirmed in various studies, including those conducted in Canada, where the inventory demonstrated acceptable internal consistency (Cronbach's alpha values above 0.80) and construct validity in university student populations (Pourjaberi et al., 2023).

2.2.2. Mindfulness

To assess the moderating variable of mindfulness, the Five Facet Mindfulness Questionnaire (FFMQ), developed by Baer et al. (2006), was used. This widely used instrument evaluates mindfulness as a multifaceted construct and contains 39 items covering five subscales: "Observing," "Describing," "Acting with Awareness," "Nonjudging of Inner Experience," and "Nonreactivity to Inner Experience." Each item is rated on a 5-point Likert scale from 1 (never or very rarely true) to 5 (very often or always true), with higher scores reflecting greater levels of mindfulness. The FFMQ has been translated and validated in multiple cultural contexts, including Canada, where studies have supported its factorial structure and reliability, reporting Cronbach's alpha coefficients ranging from 0.75 to 0.91 across subscales (Omidi et al., 2024).

2.2.3. Childhood Adversity

Childhood adversity was assessed using the Childhood Trauma Questionnaire–Short Form (CTQ-SF), originally developed by Bernstein et al. (1994). This 28-item self-report inventory measures five types of maltreatment: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. Each item is rated on a 5-point Likert scale ranging from 1 (never true) to 5 (very often true), with higher scores indicating more severe childhood trauma. The CTQ-SF also includes three validity items designed to detect minimization or denial of abuse experiences. The reliability and validity of the CTQ-SF have been well established in diverse populations. In Canada, validation studies have demonstrated satisfactory internal consistency for all subscales (Cronbach's alpha values above 0.70) and strong construct validity, confirming the tool's suitability for assessing childhood adversity in Canadian samples (Alizadeh et al., 2023).

2.3. Data Analysis

Data analysis was conducted using SPSS version 27 and AMOS version 21. Initially, descriptive statistics were calculated to summarize demographic variables and total scores on the study scales. Pearson correlation analysis was used to assess the bivariate relationships between the dependent variable (cognitive flexibility) and the independent variables (childhood adversity and mindfulness). To test the hypothesized model and examine the moderating role of mindfulness in the relationship between childhood adversity and cognitive flexibility, structural equation modeling (SEM) was conducted using AMOS-21. Model fit indices, including the chi-square test, root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis index (TLI), were used to evaluate the adequacy of the proposed model.

3. Findings and Results

The final sample included 380 participants residing in Thunder Bay. Among them, 212 participants (55.8%) identified as female and 168 participants (44.2%) as male. In terms of age distribution, 97 participants (25.5%) were between 18 and 25 years old, 144 participants (37.8%) were aged 26 to 35, 86 participants (22.6%) were between 36 and 45, and 53 participants (13.9%) were older than 45 years. Regarding educational background, 61 participants (16.1%) had a high school diploma or less, 203 participants (53.4%) held a bachelor's degree, and 116 participants (30.5%) had a postgraduate degree (master's or higher). These frequencies reflect a diverse representation across age, gender, and educational levels in the studied population.

The descriptive analysis indicated that participants reported a moderate to high level of cognitive flexibility (M = 108.37, SD = 13.42) and mindfulness (M = 126.84, SD = 15.07). The mean score for childhood adversity was 58.26 (SD = 12.93), suggesting a moderate level of reported adverse experiences during childhood across the sample (Table 1).

Table 1

Descriptive Statistics for Main Variables (N = 380)

Variable	Mean (M)	Standard Deviation (SD)
Cognitive Flexibility	108.37	13.42
Mindfulness	126.84	15.07
Childhood Adversity	58.26	12.93

As shown in Table 2, cognitive flexibility was positively correlated with mindfulness (r = .59, p < .001) and negatively correlated with childhood adversity (r = –.44, p < .001). Mindfulness was also negatively associated with childhood adversity (r = –.36, p < .001). These findings suggest significant associations among all the main study variables in the expected directions.

Prior to conducting the main analyses, assumptions of normality, linearity, multicollinearity, and homoscedasticity were assessed and met. Skewness and kurtosis values for the main variables ranged from -0.74 to 0.68 and -0.89 to 0.94, respectively, indicating no significant deviation from normal distribution. Linearity was confirmed through scatterplots that showed a linear pattern between the independent and dependent variables. Variance inflation factor (VIF) values for all predictors were below 2.3, well under the acceptable threshold of 10, indicating no concerns with multicollinearity. Additionally, the assumption of homoscedasticity was verified through visual inspection of standardized residual plots, which showed constant variance across predicted values. These results support the appropriateness of Pearson correlation and structural equation modeling for further analysis.

Table 2

Pearson Correlation Coefficients Between Study Variables (N = 380)

Variable	1	2	3
1. Cognitive Flexibility	—		
2. Mindfulness	.59** (p < .001)	—	
3. Childhood Adversity	–.44** (p < .001)	–.36** (p < .001)	—

The structural model demonstrated an excellent fit to the data. The chi-square to degrees of freedom ratio (χ^2/df = 1.78) was below the acceptable cutoff of 3. GFI = 0.94, AGFI = 0.91, CFI = 0.96, and TLI = 0.95—all of which met or exceeded conventional thresholds. The RMSEA value was 0.044, also within the acceptable range (< .06), indicating an adequate model fit (Table 3).

Table 3

Fit Indices for the Structural Equation Model

Fit Index	Value	Recommended Threshold
Chi-Square (χ^2)	128.46	—
Degrees of Freedom (df)	72	—
χ^2/df	1.78	< 3
GFI	0.94	≥ 0.90
AGFI	0.91	≥ 0.90
CFI	0.96	≥ 0.95
TLI	0.95	≥ 0.95
RMSEA	0.044	≤ 0.06

The path analysis revealed that childhood adversity had a significant negative direct effect on cognitive flexibility (B = –0.41, β = –0.36, p < .001) and a significant negative effect on mindfulness (B = –0.46, β = –0.39, p < .001). Mindfulness, in turn, had a significant positive direct effect on cognitive flexibility (B = 0.53, β = 0.48, p < .001). Importantly, the indirect effect of childhood adversity on cognitive flexibility through mindfulness was also

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significant (B = –0.24, β = –0.19, p < .001), indicating that mindfulness partially mediated this relationship. The total effect of childhood adversity on cognitive flexibility was –0.65 (β = –0.55, p < .001), suggesting a strong cumulative influence (Table 4).

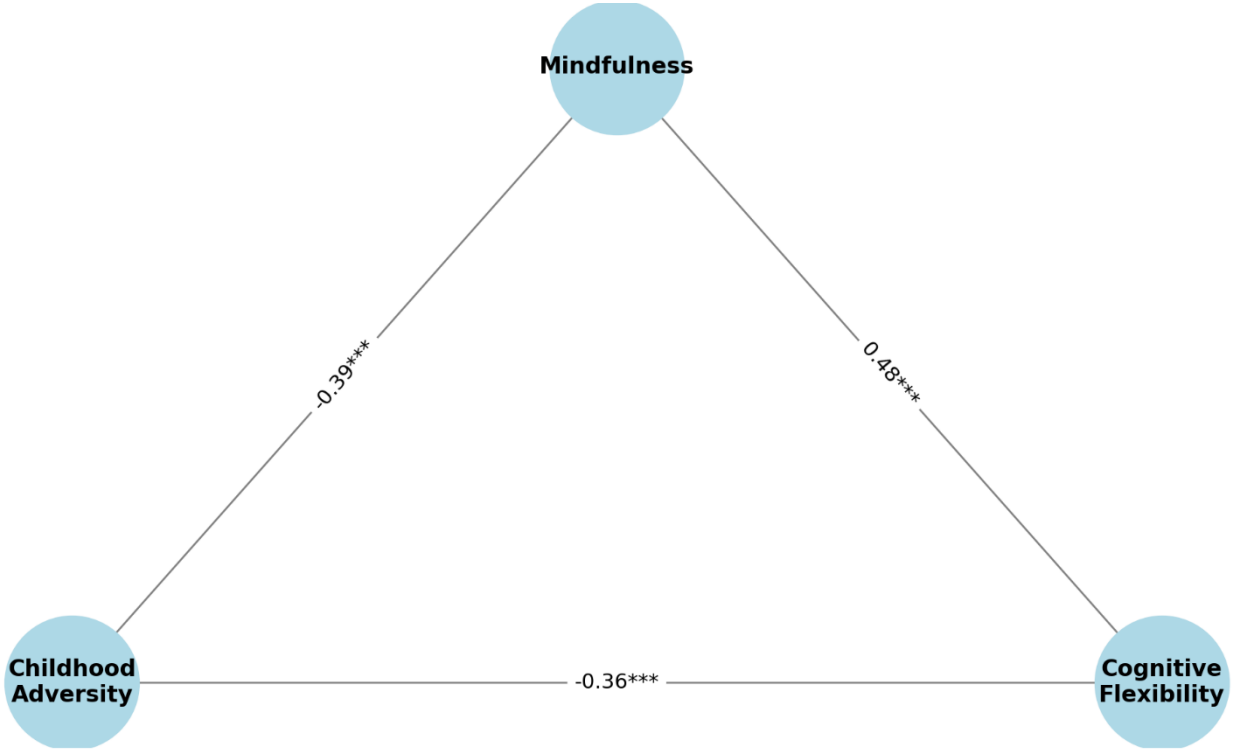
Table 4

Direct, Indirect, and Total Path Coefficients in the Structural Model

Path	B	S.E.	Beta	p
Childhood Adversity → Cognitive Flexibility (Direct)	–0.41	0.06	–0.36	< .001
Mindfulness → Cognitive Flexibility (Direct)	0.53	0.05	0.48	< .001
Childhood Adversity → Mindfulness (Direct)	–0.46	0.07	–0.39	< .001
Childhood Adversity → Cognitive Flexibility (Indirect via Mindfulness)	–0.24	0.04	–0.19	< .001
Childhood Adversity → Cognitive Flexibility (Total)	–0.65	0.07	–0.55	< .001

Figure 1

Model with Path Coefficients



4. Discussion and Conclusion

The primary objective of this study was to examine the relationship between childhood adversity and cognitive flexibility and to investigate whether mindfulness moderates this relationship. The findings of the Pearson correlation analysis revealed significant negative correlations between childhood adversity and cognitive flexibility, and significant positive correlations between mindfulness and cognitive flexibility. Structural equation modeling further confirmed that mindfulness moderated the relationship between childhood adversity and cognitive flexibility. Specifically, individuals with higher levels of mindfulness exhibited a weaker negative association between childhood adversity and cognitive flexibility, suggesting that mindfulness plays a protective, buffering role.

These findings are in line with the growing body of literature demonstrating that adverse childhood experiences (ACEs) have detrimental effects on executive functioning, particularly cognitive flexibility. Cognitive flexibility—the capacity to adapt thinking in response to novel or shifting contexts—has been shown to be compromised in individuals exposed to early trauma (Kalia et al., 2021). These results

correspond with prior studies indicating that chronic exposure to stress in childhood negatively impacts neural circuits associated with flexibility, especially in the prefrontal cortex and anterior cingulate cortex (Choi et al., 2023). As supported by longitudinal evidence, such neurodevelopmental disruptions can persist into adulthood, influencing not only cognitive functioning but also psychological well-being and adaptability in stressful situations (Johnson, 2022; Manavbasi & Stine-Morrow, 2024).

This study also supports the theoretical assertion that cognitive inflexibility may act as a mechanism through which early trauma exerts its long-term impact. Bashir and Majeed (2023) found that adolescents with high levels of ACEs exhibited lower levels of cognitive flexibility, which in turn predicted maladaptive goal orientation patterns (Bashir & Majeed, 2023). Similarly, Kalia et al. (2020) demonstrated that childhood maltreatment predicted perceived threat and cognitive rigidity in response to stressors such as the COVID-19 pandemic (Kalia et al., 2020). The current study builds on this line of research by examining a broader, non-clinical population of adults in Thunder Bay, thereby extending the generalizability of prior findings to a new cultural context.

A key contribution of this study is its exploration of mindfulness as a moderating variable. The significant moderating effect indicates that individuals with higher mindfulness scores demonstrated more preserved cognitive flexibility, even in the presence of high levels of childhood adversity. This aligns with previous findings suggesting that mindfulness has both direct and moderating effects on psychological functioning. For instance, Dolbier et al. (2021) reported that dispositional mindfulness moderated the relationship between ACEs and psychopathological symptoms, suggesting that mindful individuals may be better equipped to regulate their emotions and thoughts in the face of early trauma (Dolbier et al., 2021). Likewise, McKeen et al. (2021) found that mindfulness weakened the impact of childhood adversity on depression, highlighting its potential as a protective factor in mental health outcomes (McKeen et al., 2021).

Moreover, the interaction observed in this study may be explained by the cognitive mechanisms enhanced through mindfulness. Mindfulness promotes meta-cognitive awareness, attentional control, and emotional regulation, which in turn contribute to greater flexibility in thought and behavior (Kong & Jang, 2024; Lee & Chae, 2024). Beshai and Parmar (2019) highlighted how mindfulness reduces the long-term psychological burden of abuse by allowing individuals to process and reframe traumatic experiences without excessive rumination or avoidance (Beshai & Parmar, 2019). In line with this, Li et al. (2022) demonstrated that mindfulness improved executive functioning and emotional well-being in middle school students during the pandemic, suggesting that its benefits are applicable across age groups and contexts (Li et al., 2022).

Our findings further resonate with the results of Kong and Jang (2024), who found that mindfulness significantly enhanced cognitive flexibility among counselors, suggesting its utility in professional and high-stress environments (Kong & Jang, 2024). Similarly, Kotera and Rhodes (2019) found that individuals with higher mindfulness and cognitive flexibility were less likely to engage in compulsive or addictive behaviors, even when they had histories of childhood adversity (Kotera & Rhodes, 2019). These converging results underscore the importance of mindfulness in adaptive functioning and its potential therapeutic role in mitigating the long-term consequences of trauma.

The results of this study also echo the findings of Kazerooni and Gholamipour (2023), who demonstrated that cognitive flexibility plays a moderating role in the relationship between childhood trauma and emotional regulation difficulties (Kazerooni & Gholamipour, 2023). This points to a broader pattern: cognitive flexibility not only serves as an outcome affected by adversity but also functions as a mediator or moderator in multiple psychological pathways. Similarly, Aslan et al. (2022) noted that early adversity is linked to maladaptive cognitive constructions, which are foundational to addictive behaviors in adulthood; mindfulness and cognitive flexibility could thus interrupt these maladaptive trajectories (Aslan et al., 2022).

A broader narrative review by Rodríguez et al. (2021) further supports the complex interplay between neurocognition, adversity, and psychological functioning, suggesting that interventions targeting cognitive and social cognitive processes can yield significant improvements in trauma-exposed populations (Rodríguez et al., 2021). This reinforces the need for integrated models—like the one tested in the current study—that consider both risk and resilience factors in explaining cognitive outcomes.

The cross-cultural implications of these findings should also be considered. Research conducted in diverse cultural settings—including by Mongale and Amone-P'Olak (2020) in Botswana—shows that adverse family environments in childhood predict depression and cognitive impairment in

early adulthood (Mongale & Amone-P'Olak, 2020). Similarly, Zhou et al. (2024) found that cognitive flexibility and habitual thinking mediated the relationship between childhood adversity and mind wandering in Chinese populations, reinforcing the global relevance of these constructs (Zhou et al., 2024). The present study adds to this international literature by confirming similar patterns in an Canadian context, thus validating the generalizability of these cognitive-behavioral associations.

Additionally, the current findings align with the work of Künzi et al. (2022), who used data from the UK Biobank to demonstrate that life course adversity, including early trauma, significantly affects cognitive and mental health outcomes in later life (Künzi et al., 2022). The convergence of findings across age, geography, and methodology strongly supports the central role of mindfulness and cognitive flexibility in mitigating the negative effects of early adversity.

Finally, the psychological and neurobiological foundations of these relationships are supported by Kovács (2022), who reported that harmful childhood experiences impair emotion regulation and cognitive flexibility, contributing to chronic stress in adulthood (Kovács, 2022). These findings highlight the importance of early intervention and preventative strategies aimed at enhancing executive functioning and mindfulness in populations at risk due to early trauma.

Despite the strength of its findings, this study is not without limitations. First, the use of self-report measures introduces the risk of response bias, including social desirability and recall inaccuracies, particularly in the assessment of childhood adversity. Second, the cross-sectional design of the study limits causal interpretations. While significant associations and moderating effects were observed, longitudinal designs are necessary to determine temporal and directional relationships. Third, the convenience sampling method and geographic restriction to participants from Thunder Bay may limit the generalizability of the findings to other cultural or socio-economic groups. Finally, the study did not examine potential mediating mechanisms (e.g., emotion regulation, coping strategies) that could further explain the observed relationships.

Future studies should consider longitudinal and experimental designs to explore the causal mechanisms linking childhood adversity, cognitive flexibility, and mindfulness. Investigating other moderating or mediating variables—such as emotion regulation, social support, or neurobiological markers—could provide a more comprehensive understanding of the pathways involved. It would also be beneficial to replicate the study in diverse populations, including rural, low-income, and clinical groups, to enhance external validity. Incorporating objective cognitive assessments alongside self-reports could reduce bias and yield more robust findings. Finally, intervention-based studies assessing the effects of mindfulness training on cognitive flexibility in trauma-exposed individuals would offer practical insights for clinical application.

Based on the findings of this study, mindfulness-based interventions should be integrated into educational and therapeutic programs targeting individuals with a history of childhood adversity. Practitioners should emphasize cognitive flexibility as a key skill to be developed in trauma-informed care. Early prevention programs in schools and community centers can incorporate mindfulness training to enhance resilience and executive functioning among at-risk youth. Mental health professionals are encouraged to assess for childhood adversity in routine evaluations and consider incorporating mindfulness practices into cognitive rehabilitation and emotional regulation therapies.

Authors' Contributions

Not applicable.

Declaration

In order to correct and improve the academic writing of our paper, I have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The author reports no conflict of interest.

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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