

Research Article

Adverse Childhood Experiences and Depressive Disorder: A Hospital-Based Cross-Sectional Case–Control Study from North India

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A B S T R A C T

Background: Adverse childhood experiences (ACEs) are increasingly recognized as important determinants of adult mental health. Evidence suggests that childhood adversity is associated with depression; however, studies exploring cumulative ACEs in the Indian context remain limited.

Objective: To examine the association between adverse childhood experiences and depressive disorder and explore their relationship with depression severity.

Methods: A hospital-based cross-sectional case–control study was conducted at a tertiary care teaching hospital. Fifty patients diagnosed with depressive disorder according to ICD-11 Diagnostic Criteria for Research (DCR) and 50 healthy controls were recruited using purposive sampling. Controls were screened using the Self Reporting Questionnaire-20 (SRQ-20), with scores ≤ 8 considered eligible. The Adverse Childhood Experiences International Questionnaire (ACE-IQ) was administered to both groups, while depression severity among cases was assessed using the Hamilton Depression Rating Scale (HDRS). Statistical analyses included chi-square test, Wilcoxon–Mann–Whitney U test, Spearman correlation, and Kruskal–Wallis test.

Results: Cases demonstrated significantly higher ACE frequency total scores than controls (mean \pm SD: 1.90 ± 1.58 vs 1.28 ± 1.31 ; $p=0.047$). ACE frequency related to parental abuse was significantly higher among cases (0.58 ± 0.64 vs 0.12 ± 0.39 ; $p < 0.001$), demonstrating a moderate-to-large effect size. Although ACE scores showed a positive trend with increasing depression severity, no statistically significant association was observed between cumulative ACE scores and HDRS severity.

Conclusion: Adverse childhood experiences, particularly parental abuse, were significantly associated with depressive disorder in adulthood. These findings highlight the importance of incorporating trauma-informed assessment into psychiatric care and underscore the need for preventive strategies addressing childhood adversity.

Keywords: Adverse Childhood Experiences, Depression, Childhood Trauma, ACE-IQ, Depressive Disorder, India

Introduction

India, home to nearly one-fifth of the global child population, faces unique socio-cultural and economic challenges in ensuring a safe and nurturing environment for children.^{1,2} Given that approximately 42% of the Indian population is below 18 years of age, understanding childhood adversity and its long-term implications remains a public health priority. Adverse Childhood Experiences (ACEs) refer to potentially traumatic events occurring before the age of 18 years, including emotional, physical, and sexual abuse, neglect, household dysfunction, and exposure to violence.^{3,4} These experiences have increasingly been recognized as major determinants of physical and mental health outcomes across the lifespan.

The landmark CDC–Kaiser Permanente ACE Study demonstrated a strong dose–response relationship between cumulative childhood adversity and adverse adult health outcomes, including psychiatric disorders.⁵ Subsequent studies have consistently shown that childhood trauma increases vulnerability to depression, anxiety, substance use disorders, and suicidal behaviour.^{6–9} Research examining adverse childhood experiences has expanded considerably over the past two decades, reflecting increasing recognition of their long-term health consequences.¹⁰ Meta-analytic evidence further suggests robust associations between child maltreatment and depression, with emotional abuse and neglect emerging as particularly important predictors.^{9,11}

Depressive disorders are characterized by persistent sadness, anhedonia, cognitive dysfunction, and impaired psychosocial functioning.¹² Depression contributes substantially to global disability and is associated with significant personal, occupational, and societal burden. While international evidence supports the role of ACEs in depression, Indian studies examining cumulative childhood adversity among adults with depressive disorder remain limited.^{13,14}

Furthermore, much of the literature has historically focused on isolated forms of trauma rather than cumulative adversity. The World Health Organization (WHO) Adverse Childhood Experiences International Questionnaire (ACE-IQ) offers a broader framework to assess cumulative adversity across multiple domains.³ Considering the limited evidence from India, the present study aimed to compare adverse childhood experiences among individuals with depressive disorder and healthy controls and examine the association between ACEs and severity of depression. The study hypothesis was that patients with depressive disorder will report higher adverse childhood experiences (ACEs) compared with healthy controls, and higher cumulative ACE scores will be correlated with greater severity of depression

as measured by the Hamilton Depression Rating Scale (HDRS). The null hypothesis was that there will be no significant difference in adverse childhood experiences (ACEs) between patients with depressive disorder and healthy controls, and cumulative ACE scores will not be significantly correlated with severity of depression as measured by the Hamilton Depression Rating Scale (HDRS).

Methods

Study Design and Setting

This hospital-based cross-sectional case–control study was conducted at a tertiary care teaching hospital in north India.

Objectives

The objectives of the present study were to compare adverse childhood experiences (ACEs) among patients with depressive disorder and healthy controls and assess the correlation between adverse childhood experiences and severity of depression as measured by the Hamilton Depression Rating Scale (HDRS).

Participants and Sampling

A total sample of 100 participants was recruited using purposive sampling, including 50 cases and 50 controls.

Cases included adults aged 18–60 years diagnosed with depressive disorder according to the International Classification of Diseases, 11th Revision (ICD-11).¹² Controls comprised healthy attendants accompanying patients at the hospital and not directly related to psychiatric patients or other attendants.

Controls were screened using the Self Reporting Questionnaire-20 (SRQ-20) [15], and individuals scoring ≤ 8 were included in the study.

Inclusion and Exclusion Criteria

Participants aged 18–60 years who provided informed consent were included.

Participants with severe mental illness, intellectual disability, or medical illness interfering with assessment were excluded.

Study Instruments

- **Self Reporting Questionnaire-20 (SRQ-20):** Used to screen healthy controls for psychiatric morbidity.¹⁵
- **Adverse Childhood Experiences International Questionnaire (ACE-IQ):** Developed by the World Health Organization (WHO), the ACE-IQ assesses exposure to childhood adversity across multiple domains including abuse, family dysfunction, violence, and neglect.³
- **Hamilton Depression Rating Scale (HDRS):** Used to assess severity of depressive symptoms among cases.¹⁶

Ethical Considerations

Institutional Ethics Committee approval was obtained prior to study initiation. Written informed consent was obtained from all participants before enrolment.

Statistical Analysis

Data were analysed using appropriate descriptive and inferential statistics. Continuous variables were summarized as mean \pm standard deviation (SD) and median with interquartile range (IQR). Categorical variables were

presented as frequencies and percentages. Chi-square test was used to compare proportions. Wilcoxon–Mann–Whitney U test was applied for comparison of ACE scores between groups. Spearman correlation was used to explore associations between ACE scores and HDRS severity, while Kruskal–Wallis test assessed group differences across depression severity categories. A p -value <0.05 was considered statistically significant.

Results

Table 1. Sociodemographic Characteristics of Cases and Controls

Variable	Cases (n=50)	Controls (n=50)	Test Statistic	p value
Age (years), mean \pm SD	37.24 \pm 12.60	31.82 \pm 11.42	t = 2.25	0.026*
Gender, n (%)	Male: 23 (46.0) Female: 27 (54.0)	Male: 27 (54.0) Female: 23 (46.0)	$\chi^2 = 0.36$	0.549
Employment status, n (%)	Full-time: 22 (44.0) Part-time: 7 (14.0) Unemployed: 21 (42.0)	Full-time: 35 (70.0) Part-time: 5 (10.0) Unemployed: 10 (20.0)	$\chi^2 = 7.08$	0.029*
Urban residence, n (%)	47 (94.0)	42 (84.0)	$\chi^2 = 1.63$	0.201
Married, n (%)	31 (62.0)	19 (38.0)	$\chi^2 = 4.84$	0.028*

Continuous variables were compared using independent samples t-test. Categorical variables were compared using the Chi-square test. *Statistical significance was considered at $p < 0.05$

Table 2. Comparison of ACE Scores Between Cases and Controls

Parameter	Cases (Mean \pm SD)	Controls (Mean \pm SD)	p value
ACE Binary: Total Score	3.18 \pm 2.04	2.70 \pm 1.33	0.317
ACE Frequency: Parental Abuse Score	0.58 \pm 0.64	0.12 \pm 0.39	$<0.001^*$
ACE Frequency: Total Score	1.90 \pm 1.58	1.28 \pm 1.31	0.047*

*Wilcoxon–Mann–Whitney U test; statistically significant at $p < 0.05$

Table 3. Association Between ACE Scores and Depression Severity (based on HDRS) Among Cases

Parameter	Mild (n=21)	Moderate (n=16)	Severe (n=13)	p value
ACE Binary: Total Score	3.10 \pm 1.55	2.81 \pm 2.10	3.77 \pm 2.62	0.642
ACE Frequency: Parental Abuse Score	0.43 \pm 0.60	0.44 \pm 0.63	1.00 \pm 0.58	0.017*
ACE Frequency: Total Score	1.71 \pm 1.31	1.44 \pm 1.31	2.77 \pm 2.01	0.139

*Kruskal–Wallis test; statistically significant at $p < 0.05$

Table 4. Correlation Between ACE Scores and Hamilton Depression Rating Scale (HDRS) Severity

Variable	Correlation Coefficient (ρ)	p value
ACE Binary: Total Score vs HDRS Severity	0.12	0.388
ACE Frequency: Total Score vs HDRS Severity	0.19	0.191

Spearman rank correlation test

Sociodemographic Characteristics

The mean age of cases was 37.24 \pm 12.60 years compared with 31.82 \pm 11.42 years among controls. Females constituted a slight majority among cases (54%), while males represented 54% of controls. Employment rates were lower among cases, with 42% unemployed compared to 20%

among controls. No substantial differences were observed between groups regarding gender and residence. Age, employment status and marital status showed significant difference which could act as a potential confounder. (Table 1).

Adverse Childhood Experiences Among Cases and Controls

Among cases, 78% reported at least one ACE on the ACE frequency score, compared with 62% of controls. However, the difference in proportions did not reach statistical significance ($\chi^2=3.046, p=0.08$).

Cases had significantly higher cumulative ACE frequency total scores than controls (mean \pm SD: 1.90 ± 1.58 vs 1.28 ± 1.31 ; median [IQR]: 2 [1–3] vs 1 [0–2]; $W=1531.0, p=0.047$). (Table 2)

A statistically significant difference was also observed in the parental abuse domain of ACE frequency scores, with cases demonstrating substantially higher scores than controls (mean \pm SD: 0.58 ± 0.64 vs 0.12 ± 0.39 ; median [IQR]: 0.5 [0–1] vs 0 [0–0]; $W=1747.50, p<0.001$). Point-biserial correlation indicated a moderate-to-large effect size ($r=0.40$).

No statistically significant differences were observed for ACE binary total scores or other ACE domains.

Relationship Between Adverse Childhood Experiences and Depression Severity

Among cases, severe depression demonstrated relatively higher ACE scores than mild and moderate depression categories. Severe depression was associated with higher parental abuse frequency scores (1.00 ± 0.58), and this association was statistically significant ($p=0.017$) (Table 3).

However, cumulative ACE scores did not demonstrate statistically significant correlations with depression severity. Spearman correlation revealed no significant association between ACE binary total score and HDRS severity ($\rho=0.12, p=0.388$). Similarly, ACE frequency total score was not significantly correlated with HDRS severity ($\rho=0.19, p=0.191$). (Table 4) Kruskal–Wallis analysis also revealed no statistically significant differences across HDRS severity groups for ACE binary total score ($\chi^2=0.887, p=0.642$) or ACE frequency total score ($\chi^2=3.952, p=0.139$) (Table 3).

Discussion

The present study examined adverse childhood experiences among individuals with depressive disorder and healthy controls in a tertiary care setting in North India. Findings demonstrated significantly higher cumulative ACE frequency scores among individuals with depressive disorder, supporting previous literature linking childhood adversity to adult depression.^{9,17,18}

Cases demonstrated significantly higher cumulative ACE frequency total scores compared with controls, while parental abuse emerged as the most significant domain associated with depressive disorder (Table 2). These findings align with previous work by Chapman et al. and Gardner et al., which demonstrated greater risk of depression among

individuals exposed to childhood adversity.^{17,18} Humphreys et al. similarly reported robust associations between child maltreatment and depression, particularly emotional abuse and neglect.⁹

Parental abuse emerged as an especially important correlate of depressive disorder in the present study. This finding is supported by Indian literature reporting that dysfunctional family environments and hostile parenting practices are associated with poor mental health outcomes, including depression.^{14,19} Exposure to parental hostility during formative years may impair emotional regulation, coping skills, and resilience, thereby increasing vulnerability to depression in adulthood.

Although participants with severe depression tended to report higher ACE scores, the relationship between cumulative ACE burden and HDRS severity was not statistically significant (Table 3). These findings suggest that while ACEs may be associated with the occurrence of depressive disorder, symptom severity may additionally be influenced by biological, psychological, and social determinants. Similar variability has been reported in previous studies examining the relationship between cumulative trauma and severity of depressive symptoms.^{20,21}

The findings should be interpreted in light of cultural and contextual factors. Compared with Western studies, ACE prevalence in the present sample appeared lower, potentially reflecting differences in reporting practices, family structures, sociocultural norms, or underreporting of childhood adversity.

Strengths and Limitations

This study contributes to the limited Indian literature exploring cumulative adverse childhood experiences among adults with depressive disorder using the WHO ACE-IQ. Inclusion of a control group and use of standardized instruments strengthen the methodological rigor.

However, several limitations warrant consideration. The cross-sectional design precludes causal inference. Purposive sampling and the relatively small sample size may limit generalizability. Recall bias is possible given the retrospective nature of ACE reporting. Additionally, participants were recruited from a tertiary care centre, potentially limiting representativeness of community populations.

Conclusion

Adverse childhood experiences were significantly associated with depressive disorder, with cumulative ACE burden and parental abuse demonstrating stronger associations among cases than controls. While cumulative ACE scores did not significantly correlate with depression severity, severe depression showed a tendency toward higher childhood adversity.

These findings underscore the importance of trauma-informed psychiatric assessment and early preventive interventions targeting childhood adversity. Addressing ACEs through family-focused interventions, early identification, and mental health support may contribute to reducing the burden of depressive disorders.

Declarations

Ethics approval and consent to participate: Institutional Ethics Committee approval was obtained prior to study commencement. Written informed consent was obtained from all participants.

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Conflict of interest: None

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