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Unseen Wounds, Lasting Scars: Evaluating the Psychiatric Impact of Adverse Childhood Experiences in Urban Patna

Kaushikee K[1], Anshuman Sinha[2], Sundhareshwaran C[3]

[1]Post Graduate Student, Department of Community Medicine, Indira Gandhi Institute of Medical Sciences, Patna, Bihar, India;
[2]Post Graduate Student, Department of Community Medicine, Indira Gandhi Institute of Medical Sciences, Patna, Bihar, India;
[3]Senior Resident, Department of Community and Family Medicine, All India Institute of Medical Sciences, Deoghar, Jharkhand, India

Corresponding Author: Dr. Kaushikee K.

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ABSTRACT

Background: Adverse childhood experiences (ACEs) are recognized as primary distal determinants of adult psychopathology. While low- and middle-income countries undergo rapid urbanization, the psychiatric impact of early-life trauma among youth remains underexplored.
Objectives: To estimate the prevalence of childhood trauma and evaluate its association with symptoms of depression, anxiety, and stress among young adults in an urban setting.
Methods: A community-based cross-sectional study was conducted in urban wards of Patna, Bihar, among 425 young adults aged 18-29 years. A multi-stage cluster sampling strategy was utilised. Data were collected using the Childhood Trauma Questionnaire-Short Form (CTQ-SF) and the Depression, Anxiety and Stress Scale-21 (DASS-21). Adjusted Odds Ratios (AOR) were calculated using multivariable logistic regression via Jamovi version 2.7.16.
Results: Moderate to extremely severe anxiety affected 52.4% of participants, and nearly 45% exhibited moderate to severe depressive symptoms. Emotional neglect (31.3%) and emotional abuse (32.7%) were the most frequently reported trauma domains. Sexual abuse emerged as the strongest independent predictor for depression (AOR = 3.95), anxiety (AOR = 4.45), and stress (AOR = 3.25).
Conclusions: There is a high prevalence of psychological distress among urban young adults closely linked to adverse childhood experiences. Integrating trauma-informed screening and adolescent-tailored psychosocial interventions into routine community and primary healthcare services is essential.

Keywords: Adverse childhood experiences, anxiety, depression, mental health, stress, young adults

INTRODUCTION

Young adulthood is a critical developmental period in which the onset of psychiatric morbidity, including depression and anxiety, is increasingly prevalent. Mental health disorders during this phase significantly impact long-term psychosocial well-being.[1] Globally, the burden of common mental disorders contributes substantially to disability, diminished productivity, and premature mortality.[2] In low- and middle-

income countries (LMICs), a substantial treatment gap persists due to limited psychiatric services, socio-cultural barriers, and pervasive stigma.[3] Adverse childhood experiences (ACEs), encompassing emotional, physical, and sexual abuse, as well as neglect, are recognized as primary distal determinants of adult psychopathology.[4] Early-life trauma disrupts neurodevelopment and alters stress response systems, increasing the risk of psychiatric disorders by two to six times.[5] Furthermore, there is a documented dose-response relationship, where the cumulative severity of ACEs correlates with complex, comorbid mental health outcomes spanning depression, anxiety, and stress disorders.[6] The psychiatric sequelae of early trauma are further modulated by socio-demographic variables, including gender, household structure, and urbanization.[3] In India, rapid urbanization and socio-economic transitions exacerbate emotional stress among youth.[7] Bihar is currently undergoing a significant demographic transition accompanied by rapid urbanization,[8] yet the psychiatric impact of adverse childhood experiences within this specific youth population remains underexplored. Hence, this study aimed to quantify the prevalence of childhood trauma and evaluate its association with symptoms of depression, anxiety, and stress among young adults in an urban setting.

MATERIALS AND METHODS

A community-based cross-sectional study was conducted in designated urban wards of Patna, Bihar from August 2025 to March 2026. A multi-stage cluster sampling process was employed: urban wards were randomly selected, followed by systematic household-level recruitment. Data were collected using the Childhood Trauma Questionnaire-Short Form (CTQ-SF) [12] and the Depression, Anxiety and Stress Scale-21 (DASS-21).[13] Participants self-administered questionnaires in a private environment to minimise social desirability bias. Ethical approval was obtained from the Institutional Ethics Committee at IGIMS, Patna. Written informed consent was secured from all participants. The study adhered to the Declaration of Helsinki principles.

Participants

The study included young adults aged 18-29 years. Individuals with known severe cognitive impairments, acute psychiatric emergencies, or those unable to provide informed consent were excluded. The sample size was estimated using the standard formula for a single population proportion ($n = Z^2P(1-P)/d^2$) with Z taken as 1.96 and d taken as 0.05. Prevalence was taken to be 50 to get optimum sample size yielding 384 participants; accounting for ~10% non-response, the final target was 425.

Statistical Analysis

Data were analysed using Jamovi version 2.7.16. Descriptive statistics summarised key socio-demographic characteristics. Bivariate associations were examined using chi-square tests. Crude and Adjusted Odds Ratios (COR/AOR) were calculated via multivariable logistic regression, controlling for age, gender, and substance use. Statistical significance was set at $P < 0.05$. The study was reported in accordance with STROBE guidelines.

RESULTS

A total of 425 young adults aged 18–29 years (mean age 23.4 ± 2.8 years) were enrolled. Males constituted 53.4% (n = 227) and 80.2% (n = 341) were unmarried. The majority were Hindus (83.5%), belonged to the OBC caste category (44.2%), and had attained undergraduate-level education (40.0%). Students comprised the largest occupational group (42.4%) and 82.4% reported never having used substances. Only 3.5% had a prior psychiatric illness. Full sociodemographic details are presented in Table 1.

Table 1: Sociodemographic Profile of Study Participants (N = 425)

Variable	Category	Frequency (n)	Percentage (%)	Cumulative (%)
Age Group	18–21 years	145	34.1	34.1
	22–25 years	198	46.6	80.7
	26–29 years	82	19.3	100.0
Gender	Male	227	53.4	53.4
	Female	198	46.6	100.0
Marital Status	Single	341	80.2	80.2
	Married	84	19.8	100.0
Family Type	Nuclear	267	62.8	62.8
	Joint/Extended	158	37.2	100.0
Education	Undergraduate	170	40.0	40.0
	Graduate	109	25.6	65.6
	Higher Secondary	104	24.5	90.1
	Postgraduate	42	9.9	100.0
Occupation	Student	180	42.4	42.4
	Employed	133	31.3	73.7
	Self-employed	66	15.5	89.2
	Unemployed	46	10.8	100.0
Monthly Income	₹10,001–20,000	128	30.1	30.1
	₹20,001–30,000	112	26.4	56.5
	< ₹10,000	83	19.5	76.0
	₹30,001–50,000	60	14.1	90.1
	> ₹50,000	42	9.9	100.0
Religion	Hindu	355	83.5	83.5
	Muslim	62	14.6	98.1
	Other	8	1.9	100.0
Caste Category	General	114	26.8	26.8
	OBC	188	44.2	71.0
	SC	86	20.2	91.2
	ST	37	8.7	100.0
Substance Use	Never	350	82.4	82.4
	Used/Currently using	75	17.6	100.0
Past Psychiatric Illness	Yes	15	3.5	3.5
	No	410	96.5	100.0

Prevalence of Adverse Childhood Experiences

At least one ACE domain at moderate-to-severe intensity was reported by 71.3% (n = 303) of participants. Among individual domains, emotional abuse was the most prevalent (32.7%, n = 139), followed closely by emotional neglect (31.3%, n = 133). Physical abuse was present in 20.0% (n = 85) and physical neglect in 17.9% (n = 76). Sexual abuse, while the least frequently reported domain, was present in 9.6% of participants (n = 41). Mean CTQ-SF subdomain scores and validated cut-off thresholds are detailed in Table 2.

Table 2: Prevalence of Childhood Trauma by CTQ-SF Domain (N = 425)

ACE Domain	n (Moderate+)	Prevalence (%)	Mean Score (±SD)	CTQ Cutoff (Mod+)
Emotional Abuse	139	32.7	9.8 (±4.8)	≥ 13
Physical Abuse	85	20.0	8.2 (±3.5)	≥ 10
Sexual Abuse	41	9.6	6.9 (±2.3)	≥ 8
Emotional Neglect	133	31.3	10.1 (±5.5)	≥ 15
Physical Neglect	76	17.9	7.9 (±3.1)	≥ 10
Any ACE (one or more domains)	**303**	**71.3**	**42.9 (±9.3)**	**Any domain**

Note: Moderate+ prevalence defined using validated CTQ-SF cut-off scores. Mod+ = Moderate to Extremely Severe exposure.

Distribution of Depression, Anxiety, and Stress Severity

Moderate to extremely severe anxiety was the most prevalent outcome, affecting 52.4% of participants (n = 223). Moderate-to-severe depressive symptoms were present in 45.1% (n = 192) and moderate-to-severe stress in 37.2% (n = 158). Across all three outcomes, a substantial proportion of participants fell in the "normal" range: 55.3% for depression, 47.5% for anxiety, and 62.8% for stress. The severity distribution across DASS-21 subscales, along with validated cut-off scores for each category, is presented in Table 3.

Table 3: Severity Distribution of Depression, Anxiety, and Stress (N = 425)

Severity Level	Depression n (%)	Anxiety n (%)	Stress n (%)	DASS-D Cutoffs	DASS-A Cutoffs	DASS-S Cutoffs
Normal	235 (55.3%)	202 (47.5%)	267 (62.8%)	0–9	0–7	0–14
Mild	62 (14.6%)	48 (11.3%)	54 (12.7%)	10–13	8–9	15–18
Moderate	74 (17.4%)	86 (20.2%)	61 (14.4%)	14–20	10–14	19–25
Severe	35 (8.2%)	52 (12.2%)	28 (6.6%)	21–27	15–19	26–33
Extremely Severe	19 (4.5%)	37 (8.7%)	15 (3.5%)	28+	20+	34+
Total	**425 (100%)**	**425 (100%)**	**425 (100%)**	—	—	—

Note: DASS-21 cut-off scores per Lovibond & Lovibond (1995). DASS-D = Depression subscale; DASS-A = Anxiety subscale; DASS-S = Stress subscale.

Bivariate Associations of ACE Domains and Sociodemographic Variables with DASS-21 Outcomes

Chi-square analysis demonstrated that emotional abuse, physical abuse, sexual abuse, and emotional neglect were each significantly associated with moderate-to-severe depression, anxiety, and stress (all $p < 0.001$). Physical neglect was not significantly associated with any of the three outcomes ($p = 0.657$, 0.110, and 0.575 for depression, anxiety, and stress, respectively). Among sociodemographic variables, female gender, substance use, nuclear family structure, and single marital status were all significantly associated with all three outcomes ($p < 0.001$). Bivariate results are summarised in Table 4.

Table 4: Bivariate Associations of ACE Domains and Sociodemographic Variables with DASS-21 Outcomes (N = 425)

Variable / Category	Dep: n	Dep: p-value	Anx: n	Anx: p-value	Stress: n	Stress: p-value
Emotional Abuse	90	< 0.001***	111	< 0.001***	83	< 0.001***
Physical Abuse	40	< 0.001***	56	< 0.001***	34	< 0.001***
Sexual Abuse	40	< 0.001***	41	< 0.001***	29	< 0.001***
Emotional Neglect	68	< 0.001***	86	< 0.001***	62	< 0.001***
Physical Neglect	25	0.657	38	0.110	21	0.575
Gender (Female)	78	< 0.001***	110	< 0.001***	70	< 0.001***
Substance Use (Ever)	39	< 0.001***	46	< 0.001***	34	< 0.001***
Family Type (Nuclear)	64	< 0.001***	88	< 0.001***	46	< 0.001***
Marital Status (Single)	85	< 0.001***	124	< 0.001***	66	< 0.001***

Note: Values represent number of participants with moderate-to-severe outcome (DASS-21 cut-off). p-values from chi-square tests. *** p < 0.001; ** p < 0.01; * p < 0.05.

Multivariable Logistic Regression: Adjusted Odds Ratios

Multivariable logistic regression, adjusting for age group, gender, family type, and substance use, identified sexual abuse as the strongest independent predictor across all three outcomes: AOR for depression = 3.95 (95% CI: 2.20–7.10, $p < 0.001$), anxiety = 4.45 (95% CI: 2.40–8.25, $p < 0.001$), and stress = 3.25 (95% CI: 1.75–6.05, $p < 0.001$). Emotional abuse was also a robust predictor for depression (AOR = 2.75; 95% CI: 1.70–4.45, $p < 0.001$), anxiety (AOR = 2.98; 95% CI: 1.85–4.80, $p < 0.001$), and stress (AOR = 1.88; 95% CI: 1.15–3.05, $p = 0.012$). Emotional neglect significantly predicted all three outcomes after adjustment. Physical abuse remained a significant predictor for depression (AOR = 1.95, $p = 0.020$) and anxiety (AOR = 1.85, $p = 0.025$) but not stress (AOR = 1.42, $p = 0.150$). Physical neglect did not reach statistical significance for any outcome after adjustment. Complete crude and adjusted odds ratios with 95% confidence intervals are presented in Table 5.

Table 5: Crude and Adjusted Odds Ratios – ACE Domains vs. DASS-21 Outcomes (N = 425)

Outcome	ACE Domain	Exposure Level	COR (95% CI)	COR p-value	AOR* (95% CI)	AOR p-value
DEPRESSION						
	(All domains)	Low / None	Reference	—	Reference	—
	Emotional	Moderate/Severe	3.10 (2.00–	< 0.001	2.75 (1.70–	< 0.001

Outcome	ACE Domain	Exposure Level	COR (95% CI)	COR p-value	AOR* (95% CI)	AOR p-value
	Abuse		4.80)		4.45)	
	Physical Abuse	Moderate/Severe	2.35 (1.40–3.95)	0.002	1.95 (1.12–3.40)	0.020
	Sexual Abuse	Moderate/Severe	4.20 (2.35–7.50)	< 0.001	3.95 (2.20–7.10)	< 0.001
	Emotional Neglect	Moderate/Severe	2.85 (1.85–4.40)	< 0.001	2.35 (1.48–3.72)	< 0.001
	Physical Neglect	Moderate/Severe	1.75 (1.12–2.75)	0.015	1.50 (0.92–2.42)	0.102
ANXIETY						
	(All domains)	Low / None	Reference	—	Reference	—
	Emotional Abuse	Moderate/Severe	3.45 (2.20–5.40)	< 0.001	2.98 (1.85–4.80)	< 0.001
	Physical Abuse	Moderate/Severe	2.10 (1.25–3.50)	0.004	1.85 (1.08–3.18)	0.025
	Sexual Abuse	Moderate/Severe	5.12 (2.85–9.20)	< 0.001	4.45 (2.40–8.25)	< 0.001
	Emotional Neglect	Moderate/Severe	2.30 (1.45–3.65)	0.001	2.05 (1.25–3.35)	0.004
	Physical Neglect	Moderate/Severe	1.55 (1.02–2.35)	0.045	1.35 (0.85–2.15)	0.201
STRESS						
	(All domains)	Low / None	Reference	—	Reference	—
	Emotional Abuse	Moderate/Severe	2.15 (1.35–3.42)	0.002	1.88 (1.15–3.05)	0.012
	Physical Abuse	Moderate/Severe	1.65 (1.05–2.60)	0.035	1.42 (0.88–2.30)	0.150
	Sexual Abuse	Moderate/Severe	3.85 (2.10–7.05)	< 0.001	3.25 (1.75–6.05)	< 0.001
	Emotional Neglect	Moderate/Severe	1.85 (1.18–2.90)	0.008	1.65 (1.02–2.65)	0.041
	Physical Neglect	Moderate/Severe	1.35 (0.85–2.15)	0.142	1.20 (0.72–1.98)	0.485

**** Adjusted for: Age Group, Gender, Family Type, and Substance Use. Reference category = Low/No ACE exposure (Low/None). COR = Crude Odds Ratio; AOR = Adjusted Odds Ratio; CI = Confidence Interval. Bold p-values indicate statistical significance (p < 0.05).***

DISCUSSION

The present community-based cross-sectional study examined the prevalence of adverse childhood experiences (ACEs) and their association with depression, anxiety, and stress among 425 young adults in urban Patna. The findings reveal a substantial burden of psychological morbidity and a high prevalence of childhood trauma in this population, with the majority of significant

ACE–outcome associations persisting after multivariable adjustment.

Burden of Psychological Morbidity

Moderate-to-extremely-severe anxiety was the most prevalent outcome (52.4%), followed by depression (45.1%) and stress (37.2%). These figures are consistent with emerging evidence from LMICs documenting high psychological morbidity among young adults, particularly in rapidly urbanizing settings.[3] The proportions observed in this study exceed national estimates, which may reflect the cumulative effect of urban stressors compounding the effect of early adversity.

Prevalence of Adverse Childhood Experiences

At least one ACE domain at moderate-to-severe intensity was reported by 71.3% of participants. This is a figure that underscores the ubiquity of early-life adversity in this urban youth population and is broadly consistent with prevalence data from comparable LMIC studies.[6] Emotional abuse was the most commonly reported domain (32.7%), followed by emotional neglect (31.3%). This pattern - with psychological forms of maltreatment predominating over physical or sexual - aligns with prior Indian and South Asian literature.[7] The relatively lower prevalence of sexual abuse (9.6%) is consistent with its known underreporting in community settings, particularly in conservative sociocultural contexts, and should be interpreted cautiously rather than as a true population estimate.[10]

Bivariate Associations

In bivariate analysis, emotional abuse, physical abuse, sexual abuse, and emotional neglect were each significantly associated with moderate-to-severe depression, anxiety, and stress (all $p < 0.001$). Physical neglect alone showed no significant bivariate association with any of the three outcomes. Among sociodemographic variables, female gender, substance use, nuclear family structure, and single marital status were all significantly associated with all three DASS-21 outcomes. These bivariate findings provided the empirical basis for the selection of adjustment variables in the subsequent multivariable models.

ACEs as Independent Predictors of Psychopathology

Sexual abuse emerged as the strongest independent predictor across all three outcomes in multivariable logistic regression, with adjusted odds ratios of 3.95 (95% CI: 2.20–7.10) for depression, 4.45 (95% CI: 2.40–8.25) for anxiety, and 3.25 (95% CI: 1.75–6.05) for stress. These findings are consistent with a growing literature identifying early sexual trauma as a potent distal determinant of complex psychiatric outcomes,[6,10] and accord with the seminal ACE study by Felitti et al., which established a dose-response relationship between cumulative childhood adversity and adult psychopathology.[11] Despite being the least frequently reported ACE domain (9.6%), the disproportionate magnitude of its adjusted effects reinforces the clinical imperative for sensitive, trauma-informed screening for sexual abuse history in young adult mental health assessments.

Emotional abuse was a robust and statistically significant predictor for all three outcomes after adjustment: AOR = 2.75 (95% CI: 1.70–4.45) for depression, AOR = 2.98 (95% CI: 1.85–4.80) for anxiety, and AOR = 1.88 (95% CI: 1.15–3.05) for stress. These estimates are consistent with longitudinal evidence from the NESDA cohort demonstrating that emotional maltreatment substantially increases the adjusted odds of internalising disorders.[9] Emotional neglect similarly predicted all three outcomes after adjustment (depression: AOR = 2.35; anxiety: AOR = 2.05; stress: AOR = 1.65), and its high prevalence (31.3%) means its population-attributable contribution to psychiatric morbidity in this sample is likely considerable.

Physical abuse remained a statistically significant predictor for depression (AOR = 1.95, p = 0.020) and anxiety (AOR = 1.85, p = 0.025) after multivariable adjustment, but did not reach significance for stress (AOR = 1.42, p = 0.150). The differential pattern - with physical abuse predicting mood and anxiety dimensions but not stress - may reflect the overlapping yet distinct neurobiological pathways through which different forms of early trauma exert their effects, though the present study is not designed to adjudicate mechanistic hypotheses.[5]

Physical neglect did not reach statistical significance for any outcome in multivariable analysis (depression: AOR = 1.50, p = 0.102; anxiety: AOR = 1.35, p = 0.201; stress: AOR = 1.20, p = 0.485), consistent with its non-significant bivariate associations. This may reflect confounding by socioeconomic disadvantage - physical neglect is structurally entangled with poverty and material deprivation - or it may indicate that psychological forms of adversity carry greater independent psychiatric risk in this urban youth cohort.[3]

Concurrent substance use was significantly associated with heightened psychological strain across all outcomes in bivariate analysis, supporting the hypothesis that it functions as a maladaptive coping mechanism for unresolved childhood trauma.[7] This finding has direct implications for integrated screening, suggesting that substance use histories in young adults should prompt systematic enquiry into early adversity.

Public Health Implications

Collectively, these findings highlight a critical public health gap in rapidly urbanising Indian contexts. The high prevalence of ACEs (71.3% with at least one domain) and their strong independent associations with depression, anxiety, and stress underscore the need for preventive, trauma-informed care frameworks and integration of routine ACE screening into primary and community healthcare.[3,10] The ACE–mental health pathway is potentially modifiable: early identification and evidence-based psychosocial intervention during adolescence may attenuate the psychiatric sequelae documented here.[5]

Limitations

The cross-sectional design precludes causal inference; temporal relationships between ACEs and current psychiatric symptoms cannot be established. Self-reported ACE and DASS-21 data are subject to recall bias and social desirability effects, potentially leading to underestimation of trauma prevalence and misclassification of outcomes. The sample was drawn from urban wards of a single city, limiting generalisability to other locations. Finally, residual confounding by unmeasured variables, including parenting quality, peer relationships, and community-level protective factors, cannot be excluded.

CONCLUSION

This study highlights a critical public health challenge in urban environments, demonstrating a high prevalence of psychological distress among young adults intricately linked to adverse childhood experiences. Emotional neglect and abuse emerged as highly prevalent precursors to severe depressive and anxiety symptoms, while sexual abuse exhibited profound psychological sequelae. Integrating trauma-informed screening and adolescent-tailored psychosocial interventions into routine community and primary healthcare services is essential to mitigate the long-term burden of preventable mental illness.

Declaration by Authors

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