

Childhood Trauma and Suicidal Behaviors: A Systematic Review and Meta-Analysis in Non-Clinical Populations

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Abstract

Aim: This meta-analysis was conducted to determine the effect size of childhood traumatic events on suicide attempts in non-clinical populations.

Method: A systematic search was conducted in PubMed, and longitudinal and cross-sectional studies that retrospectively assessed childhood trauma occurring before age 18 and examined suicide attempts in adulthood using validated self-report instruments were included. Ultimately, the random-effects meta-analysis included 26 independent studies (published between 2014 and 2024) from 14 countries, involving more than 380,000 participants and providing 56 effect sizes.

Results: Childhood traumatic experiences were associated with a 2.82-fold increased odds of suicide attempts (pooled OR = 2.82, 95% CI: 2.54–3.13, $P < 0.001$, $I^2 = 98.8\%$). The strongest associations were observed for childhood sexual abuse (OR = 4.93, 95% CI: 3.37–7.21), physical abuse (OR = 4.34, 95% CI: 3.33–5.66), and emotional abuse (OR = 3.24, 95% CI: 2.41–4.36).

Conclusion: A systematic review of previous studies demonstrated that childhood traumatic experiences, particularly sexual and physical abuse, significantly increase the risk of suicidal behaviors. These findings underscore the critical importance of implementing prevention programs and routine screening for childhood traumatic experiences in adolescent and young adult populations.

Keywords: Suicidal Behaviors, Childhood Trauma, Early Abuse Experiences, suicide attempts

Introduction

Suicide remains a critical global public health crisis, claiming approximately 700,000 lives annually (Maydom et al., 2024). A substantial body of evidence indicates that individuals with a history of childhood trauma—including physical, sexual, and emotional abuse, as well as neglect—are at a 3.5-fold higher risk for suicide attempts compared to their peers (Moçambique et al., 2024). Furthermore, the severity of this link is underscored by the finding that 80% of individuals who have attempted suicide report at least one moderate-to-severe childhood traumatic experience (Maydom et al., 2024).

The theoretical framework for this association integrates the stress-diathesis model with interpersonal theories of suicide. Childhood trauma acts as both a biological and psychological catalyst; it induces epigenetic changes in the serotonergic and HPA-axis systems, which raise pain tolerance and diminish fear of death, thereby fostering the “acquired capability for suicide” (Ludwig et al., 2017; Chalker et al., 2022). Simultaneously, these experiences shape insecure attachment styles, which calibrate the cognitive system toward chronic pessimism, perceived burdensomeness, and profound hopelessness (Ludwig et al., 2017). Within the Integrated Motivational-Volitional (IMV) model, these traumas function as pre-motivational drivers that, by facilitating feelings of defeat and entrapment, provide the psychological momentum required for the transition from suicidal ideation to an actual suicide attempt (Maydom et al., 2024).

Despite this established link, empirical research reveals inconsistencies regarding the specific nature of these traumas and their impact on suicide attempts. While a meta-analysis of 68 studies confirmed that various forms of maltreatment increase the risk of suicide attempts by 2 to 3 times (Angelakis et al., 2020), other investigations highlight a lack of consensus on the differential impact of trauma types; for instance, some evidence indicates that while sexual, physical, and emotional abuse are strongly associated with suicide attempts, neglect exhibits a more variable association (Zatti et al., 2018). Furthermore, research has shifted toward identifying mediators, such as persistent psychological pain (Pompili et al., 2022), avoidant attachment (Ihme et al., 2022), and cognitive deficits including executive dysfunction and impulsivity (Rogerson et al., 2022), all of which appear to exacerbate the transition from trauma to suicide attempt (Thompson et al., 2019).

Critically, most existing literature has been disproportionately confined to clinical cohorts, creating a gap in our understanding of how these mechanisms operate within the general population. In non-clinical, community-based settings, the presence of distinct social buffers and protective factors may alter the developmental trajectory of suicidality, a nuance often missed in high-risk clinical samples. Consequently, there is a clear need to disentangle these associations within a broader context. To address these methodological and population-based ambiguities, this study focuses specifically on suicide attempts. By systematically examining the relationship between diverse childhood traumatic experiences and suicide attempts in a non-clinical population, this research aims to move beyond simple correlation, clarifying the extent to which early-life adversity acts

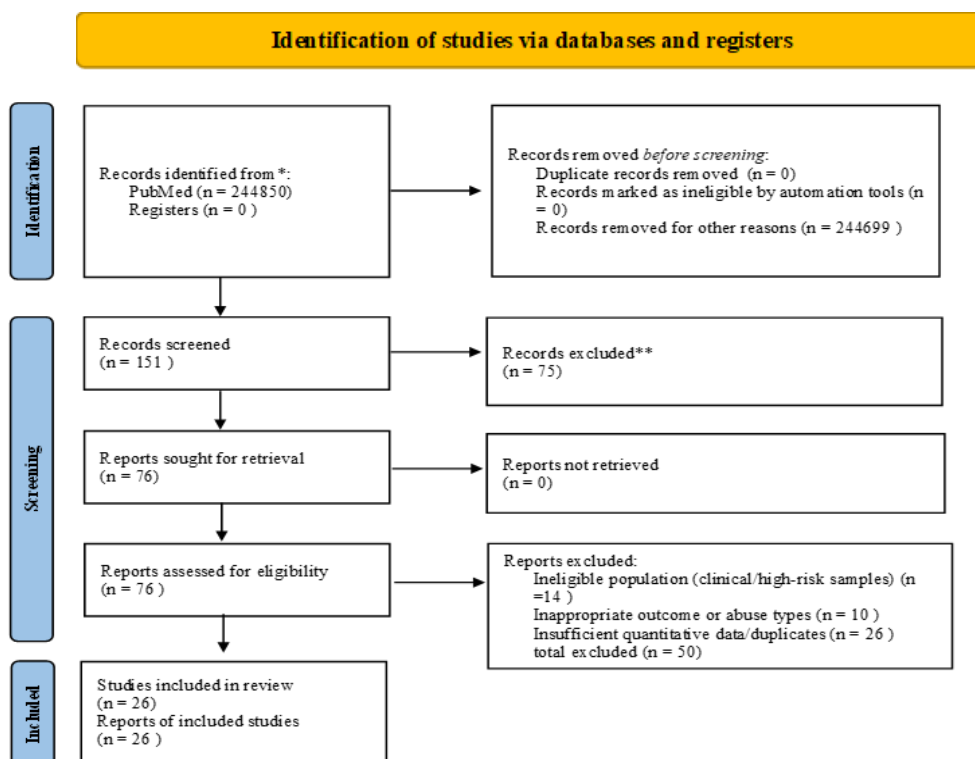
as an independent predictor or operates through the mediation of executive dysfunction and impulsivity.

Methodology

This systematic review and meta-analysis were conducted and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guideline (Page et al., 2021). The completed PRISMA checklist is provided as Supplementary Table S2. The review protocol was not prospectively registered in PROSPERO.

Search Strategy: A comprehensive literature search was conducted in the PubMed database to identify studies examining the relationship between childhood trauma and suicidal behaviors. The search was restricted to studies published in the last 15 years and limited to English-language articles. Multiple keyword combinations were employed, including: (1) adverse childhood experiences OR suicidal behaviour OR cohort study; (2) childhood trauma OR suicide OR longitudinal study; (3) child maltreatment OR suicide OR longitudinal study; (4) domestic violence OR suicide attempt study; (5) interpersonal violence OR suicide OR study; and (6) natural disaster OR suicide. These searches were performed separately, and the results were subsequently combined after deduplication.

Fig 1. PRISMA flow diagram



Eligibility Criteria: Studies were included in the meta-analysis if they were published between 2010 and 2025, examined the association between childhood traumatic and adverse experiences (including emotional, physical, or sexual abuse, neglect, and/or overall adverse experiences) and suicidal behaviors (ranging from suicidal ideation to suicide attempts) in non-clinical general population samples (e.g., school students, university students, or community-based samples), used validated self-report instruments, employed cross-sectional, longitudinal, or cohort designs, and reported sufficient quantitative data (primarily odds ratios with 95% confidence intervals) for meta-analytic synthesis. In contrast, studies conducted in clinical or high-risk populations, those that did not use standardized and validated instruments, and descriptive studies were excluded from the analysis.

Information sources: A comprehensive literature search was conducted in PubMed/MEDLINE. The search was initially performed in November 2025 and updated on December 15, 2025, to identify any newly published studies. Additionally, reference lists of included studies and relevant review articles were manually screened for potentially eligible studies. No trial registers (e.g., ClinicalTrials.gov or PROSPERO) or grey literature sources were searched.

Study Selection: The study selection process is illustrated in the PRISMA flow diagram (Figure 1). Initial searches in PubMed using multiple keyword combinations displayed a total of approximately 244,850 records across the results pages. From these, 151 potentially relevant articles were manually selected and downloaded. Bibliographic information for these 151 articles was extracted and managed using Zotero reference management software. The 151 records were then imported into the Rayyan web application (Ouzzani et al., 2016) for systematic screening. Title and abstract screening excluded irrelevant records, retaining 76 articles for full-text review. Full-text assessment of these 76 articles initially identified 44 potentially eligible studies. Ultimately, following detailed evaluation, manual verification of data availability, and exclusion of duplicates or studies with non-extractable quantitative data, 26 studies were included in the qualitative synthesis and meta-analysis. All systematic screening stages were conducted using Rayyan, with the main reasons for exclusion at the full-text stage including ineligible study population (clinical or high-risk samples), outcomes unrelated to suicidal behaviors, lack of separate reporting for relevant abuse types, or insufficient quantitative data for effect size extraction.

Data Extraction: A standardized data extraction form was developed in Microsoft Excel to capture the following information: bibliographic details (DOI/link, first author, year of publication, journal, country), study design (cross-sectional, longitudinal, or cohort), demographic characteristics (non-clinical general population, sample size, mean age at outcome assessment), exposure assessment (types of childhood trauma, including emotional, physical, or sexual abuse, neglect, or cumulative adverse childhood experiences), outcome measurement (suicidal behaviors), and effect size estimates (primarily odds ratios [ORs] with 95% confidence intervals and p-values). Data extraction

was conducted independently by two reviewers, and any discrepancies were resolved through discussion and consensus.

Risk of Bias Assessment: The methodological quality of the included studies was assessed using the Newcastle-Ottawa Scale (NOS) adapted for cross-sectional and cohort studies (Wells et al., n.d.). This scale evaluates studies based on three domains: selection of study groups (up to 4 stars), comparability of groups (up to 2 stars), and ascertainment of outcome/exposure (up to 3 stars), with a maximum score of 9 stars. Studies scoring 7–9 stars were classified as high quality (good to excellent), 5–6 stars as moderate quality, and below 5 stars as low quality. All 26 studies were rated as high quality. No studies were rated as low quality and excluded on this basis (Supplementary Table S1).

Data Synthesis and Statistical Analysis: Quantitative synthesis was performed using Comprehensive Meta-Analysis software version 4. Odds ratios (ORs) were used as the primary measure of effect size, with 95% confidence intervals (95% CI). Adjusted ORs were preferred when available; otherwise, crude ORs or raw event data were used to compute effect sizes. A random-effects model was employed to pool effect sizes, accounting for expected heterogeneity across studies. Heterogeneity was assessed using Cochran's Q statistic (with $p < 0.10$ indicating significant heterogeneity) and the I^2 statistic (interpreting values as low [$\leq 25\%$], moderate [$26\text{--}50\%$], or high [$>50\%$] heterogeneity). Subgroup analyses were conducted to explore potential sources of heterogeneity (based on type of childhood trauma: emotional, physical, sexual abuse, neglect, cumulative adverse childhood experiences). Sensitivity analyses were performed to assess the robustness of the findings. Publication bias was evaluated visually using funnel plots and statistically using Egger's regression test and Begg's rank correlation test; the trim-and-fill method was applied if asymmetry was detected. Statistical significance was set at $p < 0.05$. Forest plots were generated to display individual and pooled effect sizes.

Results

The literature search and study selection process is presented in the PRISMA 2020 flow diagram (Figure 1). Ultimately, 26 studies met the inclusion criteria and were included in the qualitative and quantitative synthesis. These studies have been summarized in Table 1.

Table 1. Characteristics of included studies

Author (Year)	Country	Study Design	Sample Size	Variables (Exposure / Outcome)	Effect Size (OR with 95% CI)	Measurement Instruments
Dunn et al. (2014)	USA	Longitudinal study	15,701	Physical abuse, Sexual abuse / Suicidal	Physical abuse (preschool 3–5): OR = 2.80 for suicidal ideation	Self-report questionnaires (single items for

				ideation, Depression	Sexual abuse (early childhood 0–5): OR = 3.94 for suicidal ideation Sexual abuse (preschool 3– 5): OR = 3.64 for suicidal ideation Sexual abuse (infancy 0–2): OR = 5.17 for suicidal ideation	abuse and suicidal ideation; 9- item CES- D for depression)
Pournaghas h & Amin (2019)	Iran	cross- sectional retrospect ive	487	Relational ACEs / Suicide risk suicidal ideation modified Likelihood of Future Suicide	Domains (from Table 3 – univariate OR for SR): • Caregivers' maltreatment: 3.83 (2.54–5.75) • Household relational dysfunction: 1.64 (1.06– 2.54) • School events: 2.68 (1.78–4.04) • Sexual abuse: 2.93 (1.43– 5.98) Cumulative events vs. no event (from Table 4 – Indicator method for SR): • 1-2 events: 1.86 (0.69– 5.03) [ns] • 3-4 events: 4.92 (1.82– 13.31) • 5-6 events: 6.75 (2.35– 19.39) • ≥7 events: 11.77 (4.04– 34.01) Highest cumulative for SR (vs. previous category): ≥7 events: 4.20 (2.29–7.71)	Custom questionnai re (12 Yes/No items based on CTQ, TEC, CDC/WHO definitions) Outcome: Suicide Behaviors Questionna ire-Revised (SBQ-R; Osman et al., 2001) - Item 2 → PYSI (binary) - Item 4 → mLoFS (binary) - Total score ≥7 → SR (at risk)
Yang et al. (2023)	USA	cross- sectional	13, 677	Recent violence experiences / Suicide plan, Suicide attempt	2 forms: Suicide plan 4.9 (3.7–6.6); Attempt 8.9 (5.6– 14.0) 3 forms: Suicide plan 13.0 (6.2–27.5); Attempt 48.7 (22.2–106.9)	Exposure & Outcome: Single items from 2019 Youth Risk Behavior

						Survey (YRBS) questionnaire (self-reported, dichotomized or categorized frequency)
Aytur et al. (2020)	USA	cross-sectional	14,837	ACE / Suicidal ideation	ACE _ adjusted = 1.61	New Hampshire Youth Risk Behavior Survey (NH YRBS 2015) self-report questionnaire
Hoertel et al. (2015)	USA	cross-sectional	34,653	Childhood maltreatment (emotional neglect, physical neglect, emotional/physical/sexual abuse) / Suicide attempt	Emotional abuse = 4.23 emotional neglect = 4.19 Physical abuse = 6.21 Physical neglect = 6.62 Sexual abuse = 6.43	AUDADIS-IV structured interview (items from CTS and CTQ)
Akunzirwe et al (2024)	Uganda	Longitudinal (prospective cohort)	2773	Physical/emotional/sexual violence (lifetime in early adolescence) / Depressive symptoms and suicide attempts	Sexual violence: aOR = 2.38; Emotional violence: aOR = 1.69; Physical violence excl. caning: aOR = 1.67 (for suicide attempt)	Self-report (ICAST-CI, WHO, CADRI for violence; PHQ-A for depression; single item for suicide attempts)

Harford et al. (2014)	USA	cross-sectional	34,653	Childhood physical/emotional/sexual abuse, neglect / Suicide attempt	Physical abuse: OR = 2.72 (95% CI: 1.87–3.96) for suicide attempt with aggression Sexual abuse: OR = 2.80 (95% CI: 2.20–3.55) for suicide attempt with aggression; OR = 2.45 for suicide attempt only Emotional abuse: OR = 1.56 (95% CI: 1.14–2.14) for suicide attempt with aggression	AUDADIS-IV (items from CTS, CTQ, Wyatt)
Lensch et al. (2021)	USA	Cross-sectional	10321	Adverse childhood experiences (sexual/physical/verbal abuse, witnessing violence, etc.) / Suicidal ideation, plan, attempt	3+ ACEs (middle school): APR = 8.03 (95% CI: 5.66–11.37) for suicide attempt 3+ ACEs (high school): APR = 3.63 (95% CI: 2.51–5.25) for suicide attempt	Youth Risk Behavior Survey (YRBS) self-report (CDC core + state-added items)
Jones et al. (2024)	USA	cross-sectional	23078	Adverse childhood experiences / Suicidal thoughts and suicide attempt	ACEs: b = 0.187 (suicidal thoughts); b = 0.178 (suicide attempt); indirect mainly through depressive symptoms	FYSAS 2022 self-report questionnaire (10 dichotomous ACE items + single items for suicidality)
McGraw et al. (2021)	USA	Cross-sectional (two waves)	10,988 (2016) + 10,563 (2018)	Adverse childhood experiences / Suicidal/self-harming thoughts and suicide attempts	Total ACEs: OR = 1.36 for suicide attempt; LGB: OR = 2.58 for suicide attempt (no significant interaction)	BRFSS (11-item ACEs questionnaire; PHQ-9 single item for thoughts; single item

						for attempts)
Thompson et al. (2018)	USA	Longitudinal (prospective cohort)	9421	Adverse childhood experiences / Suicidal ideation and suicide attempts	Sexual abuse: AOR = 2.79 for suicide attempt; AOR = 2.56 for ideation Emotional abuse: AOR = 2.36 for attempt; AOR = 2.38 for ideation Physical abuse: AOR = 1.91 for attempt; AOR = 2.01 for ideation Cumulative 3+ ACEs: AOR = 3.53 for suicide attempt; AOR = 3.13 for ideation (strong graded association)	Add Health in-home survey (face-to-face + audio CASI)
Cluver et al. (2015)	South Africa	Longitudinal (prospective cohort)	3515	Adverse childhood experiences / Suicidal behavior (ideation, planning, attempts)	ACE score (per unit): OR = 1.16 for suicide attempt; OR = 1.28 for planning; OR = 1.20 for ideation Cumulative >5 ACEs vs. 0: OR = 4.40 for suicide planning (strongest); OR = 2.46 for attempt	MINI suicidality scale; UNICEF scales for abuse; verbal autopsy for AIDS; adapted checklists for violence
McMahon et al. (2018)	USA	cross-sectional	34653	Childhood maltreatment/ suicide attempt, self-injury, interpersonal violence	Shared maltreatment factor (women): $\beta = 0.51$ for suicide attempt (strongest) Shared maltreatment factor (men): $\beta = 0.42$ for suicide attempt	AUDADIS-IV (CTS/CTQ items for maltreatment; single items for outcomes)
Ahouansea et al. (2022)	China	cross-sectional	4732	Adverse childhood experiences / Suicidal ideation and NSSI	Emotional abuse: OR $\approx$ 2.08–2.79 for suicidal ideation Emotional neglect: OR $\approx$ 1.47–2.28 for suicidal ideation	Self-report (CDC-Kaiser/AC E-IQ for ACEs; BSSI for

					Parent social support: OR = 0.63–0.66 for suicidal ideation (protective) Parent support mediates 24–44% of emotional neglect-SI association	SI; FASM for NSSI)
Maydom et al. (2024)	UK	Mixed (cross-sectional + 7-day daily diary)	489 (Phase 1); 243 (Phase 2)	Childhood trauma / Daily defeat, entrapment, stress; Lifetime suicidal ideation/attempt	Childhood trauma strongly predicts daily stress ($\beta = 6.836$), entrapment ($\beta = 2.451$), defeat ($\beta = 1.556$)	CTQ (28-item); APMS items for suicidality; ECR-RS for attachment; PSS-Brief daily
Wu et al. (2022)	China	cross-sectional	780	Childhood Trauma / Suicidal ideation; Suicidal behaviors	EA → Suicide behaviors: $\beta = 0.13, p < 0.001$; EA → Suicidal ideation: $\beta = 0.78, p < 0.001$;	Exposure: Childhood Trauma Questionnaire-Short Form (CTQ-SF) Outcome: Beck Scale for Suicide Ideation (SSI); Suicidal Behaviors Questionnaire-Revised (SBQ-R) Mediators: Perceived Stress Scale (PSS); Pittsburgh Sleep Quality Index (PSQI)

Xiao et al. (2023)	China	cross-sectional	16853	Adverse Childhood Experiences (ACEs) patterns / Suicidal ideation, Suicidal plan, Suicidal attempt	Suicidal ideation: High ACEs: aOR 7.82 (6.95–8.83) High abuse/neglect: aOR 3.78 (3.40–4.15) Moderate ACEs: aOR 2.07 (1.90–2.26) Suicidal plan: High ACEs: aOR 7.74 (6.79–8.84) High abuse/neglect: aOR 3.54 (3.15–3.99) Moderate ACEs: aOR 1.92 (1.71–2.16)	Exposure: Adverse Childhood Experiences International Questionnaire (ACE-IQ) Outcome: Single-item questions for suicidal ideation, plan, and attempt (yes/no in past 12 months)
Wan et al. (2019)	China	cross-sectional	14820	Cumulative Adverse Childhood Experiences / NSSI (Non-Suicidal Self-Injury), Suicidal ideation, Suicide attempt	Suicide Attempt (girls, highest): 5–6 ACEs: 7.14 (3.92–13.01) (boys: 3.05 (1.57–5.92))	Exposure: Child Trauma Questionnaire (CTQ) + CDC/Kaiser household dysfunction items Outcomes: Single yes/no items (NSSI: list of 8 methods + frequency; Ideation & attempt: YRBS items)

Boduszek et al. (2021)	Uganda & Jamaica	cross-sectional	18700	Corporal punishment, Physical abuse, Emotional abuse, Sexual abuse, Physical neglect, Emotional neglect, Medical neglect / NSSI only, Suicidal ideation (SI) only, Suicide attempt (SA) only, Co-occurring NSSI/SI/SA	ganda (selected significant): • Emotional abuse: All groups OR 1.96–3.36 • Severe depression: All groups OR up to 10+ • Emotional neglect: Most groups OR ~2–3 Jamaica (selected significant): • Emotional neglect: All groups OR 1.81–2.98 • Corporal punishment: All groups OR ~2–3 • Severe depression: SA & co-occurring OR extremely high (10+) • Emotional/physical abuse: SI & SA groups OR ~2	Exposure: 29-item Child Victimization Experience Questionnaire (lifetime yes/no) Anxiety/Depression: PROMIS short forms Sleep: PROMIS shortened Social support: MSPSS Outcomes: Single custom yes/no items (lifetime)
He et al. (2024)	China	cross-sectional	95549	ACEs / suicidal behaviors Adverse childhood experiences (15 types, cumulative) / Suicidal ideation and suicide attempt	4+ ACEs: PR = 1.41 for suicidal ideation; Threat-related ACEs strongest; Supportive school environment buffers association	Self-report (CDC-Kaiser/AC E-IQ for ACEs; single items for suicidality)
Stickley et al. (2018)	Estonia	cross-sectional	2455	Childhood Hunger/ Recurrent thoughts of death or suicide	Childhood hunger (sometimes): OR = 1.74; (often): OR = 1.17 (for recurrent thoughts of death/suicide)	Self-report questionnaire (Emotional State Questionnaire)

						ire, single item for suicidal thoughts; single item for childhood hunger; MINI for depression; De Jong Gierveld Loneliness Scale for social support)
Peng et al. (2022)	China	cross-sectional	16111	Childhood physical abuse / Suicidal ideation, plan, attempt	Severe childhood physical abuse: OR = 4.21 (95% CI: 3.12–5.67) for suicide attempt Moderate CPA: OR = 1.99 (95% CI: 1.60–2.47) for suicide attempt Overall aggression mediates 27.2% of the association	CTS-PC subscale (12 items) for CPA; single items for suicidal behaviors
Lannoy et al. (2025)	USA	Longitudinal (cohort)	Total: 4596 European Ancestry: 3424 African Ancestry: 1172	Adverse childhood experiences / Suicide ideation, Suicide attempt	Suicide ideation (EA): OR = 1.22 (95% CI: 1.09–1.37) Suicide attempt (EA): OR = 1.08 (95% CI: 0.99–1.17)	Exposure: Items from Add Health Waves II & III (home environment items + abuse/neglect frequency items) Outcome: Single items from Add Health Waves IV & V:

						- “During the past 12 months, did you ever seriously think about committing suicide?” - “During the past 12 months, how many times did you actually attempt suicide?” (binary recorded)
Li et al. (2021)	China	cross-sectional	14500	ACEs types & patterns (LCA: High ACEs, High abuse+neglect, High neglect, Low) / Ideation, Plan, Attempt	Patterns vs. Low ACEs: High ACEs: Ideation 5.08 (4.29–6.01); Plan 6.71 (5.45–9.25); Attempt 7.03 (5.24–9.44) High abuse+neglect: Ideation 4.15 (3.70–4.66); Attempt 5.05 (3.96–6.45) Types (highest): Emotional abuse: Ideation 3.20 (2.94–3.48); Sexual abuse: Attempt 3.81 (3.23–4.49)	CTQ-SF (maltreatment) + household dysfunction items + YRBS items
Muwanguzi et al. (2023)	Uganda	cross-sectional	653	Cumulative ACEs / Suicidal ideation	umulative ACEs (per 1 increase): aOR 1.264 (1.090–1.465) for suicidal ideation	WHO ACE-IQ (13 categories) + PHQ-9 item 9
Bravo, et al. (2024)	USA	cross-sectional	10532	Parental incarceration/ arrest / Ideation, Attempt,	Parent arrest: Ideation 1.89 (1.51–2.37); Attempt 2.69 (1.70–4.25)	PhenX + KSADS

NSSI
(lifetime)

Table 2 shows that the random-effects meta-analysis included 56 effect sizes from 26 independent studies. The squares represent the odds ratio for each study, with their size proportional to the study weight; the horizontal lines indicate the 95% confidence intervals. The diamond at the bottom of the plot represents the pooled odds ratio (OR = 2.82, 95% CI 2.54–3.13).

A random-effects meta-analysis on 56 effect sizes from 26 independent studies (with a total sample size exceeding 380,000 individuals) showed that adverse childhood experiences are associated with a 2.82-fold increased odds of suicidal attempts across the lifespan (pooled OR = 2.82, 95% CI: 2.54–3.13, $P < 0.001$, $I^2 = 98.8\%$, $K = 56$). The 95% prediction interval (OR = 1.38–5.77) indicates considerable heterogeneity in the true effect size across different populations

Table 2. Main results of random-effects meta-analysis of adverse childhood experiences and lifetime suicidal attempts

Model	k	Pooled log OR	95% CI (log)	Pooled OR	95% CI (OR)	Z-value	p-value	Q (df)	p(Q)	I ²	Tau ²	Tau	95% Prediction Interval (OR)
Random-effects	56	1.037	0.933 — 1.140	2.82	2.54 — 3.13	19.58	<0.001	465 2.58 (55)	<0.001	98.8 %	0.12 5	0.3 54	1.38 — 5.77
Fixed-effect	56	0.132	0.125 — 0.140	1.14	1.13 — 1.15	33.82	<0.001	—	—	—	—	—	—

The contour-enhanced funnel plot displays the standard error against the logarithmic odds ratio (log odds ratio) for 56 effect sizes from 26 independent studies examining the association between adverse childhood experiences and lifetime suicidal attempts. Table 2 shows that a slight asymmetry is observed in the lower-left region, suggesting potential small-study effects. The vertical line represents the pooled random-effects estimate (OR = 2.82; log OR = 1.037).

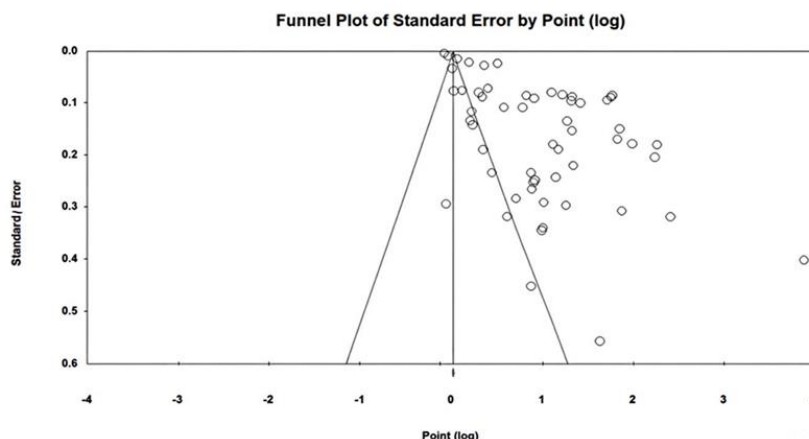


Figure 2. Funnel plot of the association between adverse childhood experiences and lifetime suicidal behaviors ($k = 56$ effect sizes).

The Duval and Tweedie trim-and-fill method estimated 18 missing studies on the left side of the mean under the random-effects model (Figure 2 / Table 3). This adjustment reduced the pooled odds ratio from 2.82 (95% CI: 2.54–3.13) to 1.82 (95% CI: 1.41–2.35). Nevertheless, the association between adverse childhood experiences and lifetime suicidal attempts remained statistically significant, indicating relative robustness against potential publication bias.

Table 3. Duval and Tweedie's trim-and-fill analysis

Model	Imputed studies (to the left of the mean)	Observed OR (95% CI)	Adjusted OR (95% CI)
Random-effects	18	2.82 (2.54–3.13)	1.82 (1.41–2.35)

Table 3. Results of the Duval and Tweedie trim-and-fill analysis for publication bias. Eighteen studies were imputed on the left side of the mean under the random-effects model, reducing the pooled odds ratio from 2.82 to 1.82. The association remained statistically significant after adjustment.

Egger and Mazumdar's rank correlation test was non-significant (Kendall's $\tau = -0.16$, one-tailed $p = 0.0398$, two-tailed $p = 0.0796$), indicating no strong evidence of publication bias.

Subgroup analysis by type of adverse childhood experience revealed a significant moderating effect ($Q_{\text{between}} = 59.61$, $df = 7$, $p < 0.001$). The strongest associations with lifetime suicidal attempts were observed for sexual abuse (OR = 4.93, 95% CI: 3.37–7.21) and physical abuse (OR = 4.34, 95% CI: 3.33–5.66), followed by emotional abuse

(OR = 3.24, 95% CI: 2.41–4.36) and neglect (OR = 2.19, 95% CI: 1.40–3.43). Cumulative/multiple adverse childhood experiences showed the weakest association, although it remained significant (OR = 1.99, 95% CI: 1.79–2.22).

Table 4. Subgroup analysis by type of adverse childhood experience

Type of ACE	k (effect sizes)	Pooled OR	95% CI	p-value	I ² (%)
Cumulative / Multiple ACEs	22	1.99	1.79–2.22	<0.001	98.8
Sexual abuse	5	4.93	3.37–7.21	<0.001	93.6
Physical abuse	11	4.34	3.33–5.66	<0.001	91.5
Emotional abuse	7	3.24	2.41–4.36	<0.001	98.5
Neglect	4	2.19	1.40–3.43	<0.001	82.1
Overall	56	3.26	2.93–3.63	<0.001	99.2
Q-between (df=7)				<0.001	

Table 4 reveals that the leave-one-out sensitivity analysis demonstrated that no single study disproportionately influenced the results. The pooled odds ratio varied from 1.99 (95% CI: 1.79 –2.22) to 3.26 (95% CI: 2.93 – 3.63) when sequentially removing individual effect sizes, confirming the robustness and stability of the overall association.

Discussion

This study comprehensively examined childhood traumas, including sexual, physical, and emotional abuse, neglect, and other adverse experiences in 26 studies with 56 effect sizes, assessing their association with suicide attempts. To enhance the comprehensiveness and generalizability of the results, studies were selected that covered four continents: the Americas, Asia, Europe, and Africa. Subgroup analyses revealed that sexual abuse had the strongest association with the emergence of suicide attempts compared to other traumas (OR = 4.93, 95% CI: 3.37–7.21). Although the present study exhibited high heterogeneity (I² = 98.8%), this was partially explained by subgroup analysis based on trauma type (Q_{between} = 59.61, df = 7, p < 0.001).

This systematic review demonstrated that childhood traumas are consistently associated with an increased risk of suicide attempts in adulthood. Among the various trauma groups, sexual abuse emerged as the strongest predictor, followed by physical abuse, emotional abuse, and neglect. This finding is consistent with the results of Lo Iacono et al. (2021), Yucel et al. (2024), Tuttleman et al. (2024), Kennedy et al. (2025), Gartland et al. (2022),

Wang et al. (2022), Chen et al. (2022), Tang et al. (2025), Ensink et al. (2021), Zhang et al. (2024), Laghaei et al. (2023), and Gamaso et al. (2025).

Psychologically, the findings are supported by the Traumagenic Dynamics Model (Finkelhor & Browne, 1985, as cited by Yucel et al., 2024). This model suggests that childhood sexual abuse fosters internalized shame through traumatic sexualization, betrayal, powerlessness, and stigmatization, all of which drive suicidal behaviors. Furthermore, Kennedy et al. (2025) note that sexual abuse distorts self-concept, increasing self-hatred. Attachment theory (Ensink et al., 2021) suggests that harm from trusted figures creates insecure internal working models, impairing emotion regulation. Similarly, Laghaei et al. (2023) identify childhood trauma as a distal risk factor that impairs emotional and cognitive processing. While Zhang et al. (2024) observed varying strengths of association for different trauma types, such differences likely reflect variations in statistical methods and populations.

Biologically, trauma-induced chronic stress overactivates the HPA axis, resulting in persistent cortisol secretion, oxidative stress, and DNA damage (Lo Iacono et al., 2021). Over time, these processes reduce hippocampal volume and prefrontal cortex activity while increasing amygdala reactivity, leading to impaired impulse control and mood regulation (Gartland et al., 2022; Lo Iacono et al., 2021). These changes, coupled with epigenetic modifications and chronic inflammation, predispose individuals to the impulsive behaviors that characterize suicide attempts (Gamaso et al., 2025).

This study has several limitations that should be acknowledged for a nuanced interpretation of the findings. Despite our rigorous subgroup analyses, high statistical heterogeneity ($I^2 = 98.8\%$) remained, suggesting that variations in measurement instruments, study designs, and demographic characteristics across the included studies may have influenced the pooled estimates. Furthermore, because many of the original studies treated childhood trauma as a secondary risk factor rather than the primary focus, there was occasional inconsistency in data transparency and the ability to control for all potential confounders. The restriction of our review to non-clinical populations also limits the direct generalizability of these findings to high-risk clinical cohorts. Additionally, the reliance on retrospective self-reports increases the risk of recall bias, and while our sensitivity and trim-and-fill analyses suggest that the results are robust, the exclusion of non-English and grey literature may still leave the review susceptible to minor language or publication biases.

Building on these findings, future research should prioritize a more comparative framework that explicitly controls for study-specific characteristics and demographic factors, such as age, gender, and cultural context, to better resolve the observed heterogeneity. We strongly recommend that future investigations employ structural equation modeling (SEM) to more clearly elucidate the mediating pathways—such as shame, self-esteem, emotion dysregulation, and cultural variables—that link early-life adversity to later suicidal behavior. From a practical standpoint, the strong association between childhood trauma, particularly sexual and emotional abuse, and suicide attempts underscores an urgent need for routine trauma screening protocols within schools, primary health centers, and youth counseling services. Implementing community-based prevention programs, educating parents on the prevention of neglect and abuse, and

providing trauma-focused therapeutic interventions, such as trauma-focused cognitive-behavioral therapy (TF-CBT) or shame-focused approaches, are critical steps toward mitigating the long-term impacts of early-life trauma and reducing the broader societal burden of suicide.

Conclusion

This study comprehensively examined childhood traumas, including sexual, physical, and emotional abuse, neglect, and other adverse experiences, assessing their association with suicidal behaviors (including suicidal ideation and attempts). Separate subgroup analyses for different types of trauma revealed that sexual abuse had the strongest predictive power compared to other types of trauma and adverse experiences in the emergence of suicidal behaviors.

This finding emphasizes the importance of early screening for traumatic experiences in children and underscores the necessity of providing care and educational training to parents and children to protect them. Additionally, for systems providing physical and mental health services, these results serve as a reminder that individuals with suicidal behaviors have deeper underlying causes that must be seriously investigated and addressed.

Disclosure Statements

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Conflict of interest

This study did not have any conflict of interest for the authors

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Supplementary

Table S1. Quality assessment of included studies using the adapted Newcastle-Ottawa Scale (NOS)

First Author, Year	Study Design	Selecti on	Comparabil ity	Outcom e/Expos ure	Total Score	Quality Rating
Dunn et al. (2014)	Cohort	4/4	2/2	3/3	9/9	High
Pournaghash & Amin (2019)	Cross-sectional	3/5	2/2	3/3	8/10	High
Yang et al. (2023)	Cross-sectional	5/5	2/2	3/3	10/10	High
Aytur et al. (2020)	Cross-sectional	4/5	2/2	3/3	9/10	High
Hoertel et al. (2015)	Cross-sectional	5/5	2/2	3/3	10/10	High
Akunzirwe et al (2024)	Cohort	4/4	2/2	3/3	9/9	High
Harford et al. (2014)	Cross-sectional	5/5	2/2	3/3	10/10	High
Lensch et al. (2021)	Cross-sectional	4/5	2/2	3/3	9/10	High
Jones et al. (2024)	Cross-sectional	4/5	2/2	3/3	9/10	High
McGraw et al. (2021)	Cross-sectional	4/5	2/2	3/3	9/10	High
Thompson et al. (2018)	Cohort	4/4	2/2	3/3	9/9	High
Cluver et al. (2015)	Cohort	4/4	2/2	3/3	9/9	High

McMahon et al. (2018)	Cross-sectional	5/5	2/2	3/3	10/10	High
Ahouanse et al. (2022)	Cross-sectional	3/5	2/2	3/3	8/10	High
Maydom et al. (2024)	Cross-sectional	3/5	2/2	3/3	8/10	High
Wu et al. (2022)	Cross-sectional	2/5	2/2	3/3	7/10	High
Xiao et al. (2023)	Cross-sectional	4/5	2/2	3/3	9/10	High
Wan et al. (2019)	Cross-sectional	4/5	2/2	3/3	9/10	High
Boduszek et al. (2021)	Cross-sectional	4/5	2/2	3/3	9/10	High
He et al. (2024)	Cross-sectional	5/5	2/2	3/3	10/10	High
Stickley et al. (2018)	Cross-sectional	4/5	2/2	3/3	9/10	High
peng et al. (2022)	Cross-sectional	4/5	2/2	3/3	9/10	High
Lannoy et al. (2025)	Cross-sectional	5/5	2/2	3/3	10/10	High
Li et al. (2021)	Cross-sectional	4/5	2/2	3/3	9/10	High
Muwanguzi et al. (2023)	Cross-sectional	3/5	2/2	3/3	8/10	High
Bravo, et al. (2024)	Cross-sectional	5/5	2/2	3/3	10/10	High

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Title (Page 1)
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Abstract (Page 1)
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Introduction (Pages 2)
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Introduction (last paragraph, Page 2) & Abstract (page1)
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	2.2 Eligibility Criteria (Page 3) & subgroup in synthesis
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	2.3 Information sources (Page 3)
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	2.1 Search Strategy (Page 2)

Section and Topic	Item #	Checklist item	Location where item is reported
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	2.4 Study Selection (Page 3-4) & Figure 1
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	2.5 Data Extraction (Page 4)
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Eligibility Criteria & Data Extraction (Pages 3-4)
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	2.5 Data Extraction (Page 4)
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	2.6 Risk of Bias Assessment (Page 4)
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	2.7 Data Synthesis (Page 4) – Odds ratios
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Eligibility & Study Selection (page 2-3)
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Not reported
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Tables1, Figure 2 (Pages 4-10)
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	2.7 Data Synthesis (Page 4) – random-effects, I ² , CMA v4
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-	Subgroup analysis by trauma type (Table 4,

Section and Topic	Item #	Checklist item	Location where item is reported
		regression).	Page 10)
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Leave-one-out sensitivity (Page 10)
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Funnel plot, Egger's, Begg's, trim-and-fill (Pages 10)
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Not reported
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	2.4. Study Selection, Figure 1(page 3-4)
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	2.4. Study Selection, Figure 1(page 3-4)
Study characteristics	17	Cite each included study and present its characteristics.	Table 1, (page 4-6)
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Supplementary, table S1, (page 13)
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Table 1, (page 4-9)
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	2.6. Risk of Bias Assessment (page 4), table 1 (page 4-9), table 4 (page 10)
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	table 4 (page 10)
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	(page 10)
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	(page 10)
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Figure 2. Funnel plot, Egger's test, Trim-and-fill (page-10)
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Not reported

Section and Topic	Item #	Checklist item	Location where item is reported
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Discussion (page 10-12)
	23b	Discuss any limitations of the evidence included in the review.	Discussion (page 10-12)
	23c	Discuss any limitations of the review processes used.	Discussion (page 10-12)
	23d	Discuss implications of the results for practice, policy, and future research.	Discussion (page 10-12)
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	The review protocol was not prospectively registered, (page 2-3)
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	No detailed protocol was prepared for this review.
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Not applicable – no protocol was prepared or registered
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Financial support (page 12)
Competing interests	26	Declare any competing interests of review authors.	Conflict of interest (page 12)
Availability of data, code, and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Availability of data and materials (page 12)

