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Adverse childhood experiences and violent extremism: A scoping review of the literature

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Adverse Childhood Experiences (ACEs) are stressful and potentially traumatic events that occur during the first two decades of life, with the potential for detrimental effects on development. ACEs are associated with a range of negative outcomes, including various violent behaviors. While there is interest in the relationship between ACEs and violent extremism (VE), it is unclear how systematically this has been studied. We conducted a scoping review of qualitative, quantitative, and mixed methods studies to synthesize the literature on ACEs and VE by searching APA PsycINFO, ProQuest Social Science Premium Collection, PubMed, and Scopus up to April 2026. Data extraction and quality appraisal were done following the Mixed Methods Appraisal Tool (MMAT). 847 records were screened. We included 23 studies that consisted of *n* = 4,946 individuals who supported or engaged in a range of right- and left-wing, Islamist, white supremacist, and other extremist groups. The most common ACEs reported across studies were related to the domain of household dysfunction, followed by maltreatment. VE individuals were observed to have a higher prevalence of ACEs compared to the general population, suggesting that ACEs may play a role in the radicalization process. Further research is needed to explore the complex relationship between ACEs and VE through longitudinal studies, adopting standardized tools and definitions, inclusion of appropriate control groups, and exploration of developmental pathways and causal mechanisms.

Keywords: adverse childhood experiences, mental health, radicalization, trauma, violent extremism

1. INTRODUCTION

Adverse Childhood Experiences (ACEs) are stressful and potentially traumatic events that occur during the first eighteen years of life. ACEs include exposure to sexual, physical, or emotional violence, neglect, household dysfunction, and deprivations and poverty (Felitti et al., 1998; The Lancet Public Health, 2021). ACEs are thought to affect a significant portion of the global population, with 39% of people retrospectively reporting at least one of these types of adverse experiences in their childhood (Kessler et al., 2010). Exposure to ACEs has the potential to

have long-lasting impacts on emotional regulation, stress-response, and cognitive development (Lund et al., 2018; Patel et al., 2018; The Lancet Public Health, 2021). Although ACEs have been used as a measure in developmental research for decades, there is substantially less literature on understanding the relationship between ACEs and violent extremism (VE).

There are several theoretical frameworks that may provide insight into the potential relationship between ACEs and VE. Social learning theory emphasizes the role of environments shaping behavioral norms, and learning through observation (Bandura & Walters, 1977). Exposure to violence during the developmental years may normalize violence and increase chances of engaging with extremist groups. Attachment theory describes how early relationships shape emotional security and emotional regulation; disruption of these relationships due to adversities may impact behavior, trust, and feelings of belonging (Bowlby, 1979; Choi et al., 2020) leaving one vulnerable to seeking secure attachments in extremist groups. General strain theory indicates that exposure to adversities may impair emotional regulation and increase vulnerability to maladaptive coping strategies such as crime and violence (Agnew, 1992).

Empirical research widely supports these frameworks and demonstrates the long-term impact of ACEs. In the health domain, a meta-analysis with 253,719 participants showed that 31,795 (13%) reported at least four ACEs and were at increased risk for all negative health outcomes, with the strongest effect size for problematic drug use and interpersonal and self-directed violence (Hughes et al., 2017). ACEs were strongly associated with violence perpetration later in life, such as intimate partner violence, physical violence, and child neglect (Hughes et al., 2017). These findings are in line with those of other reviews exploring the relationship between early-life adversities with violent and criminal behaviors (Fry et al., 2012; Papalia et al., 2018). A cross-continental study including 3,797 youth in 10 high-, middle-, and low-income countries highlighted how ACEs are associated with a range of criminal behaviors (including theft, drug trafficking, and aggression), independently of a country's level of development (Basto-Pereira et al., 2022). While this suggests that ACEs can have detrimental effects on children across countries of varying levels of development, it should be noted that exposure to adverse events in youth disproportionately affects those living in fragile contexts (Ataullahjan et al., 2020). Conflicts or natural disasters escalate the risk of stressful life events due to their impact on individual children, as well as disruption of family and community social structures that would typically protect them (Seddighi et al., 2021). It is therefore of particular importance to recognize the potential impact of ACEs on children living in fragile and conflict-affected settings, mostly located in low- middle-income countries (LMICs) (World Bank, 2023, 2022). Recent frameworks have suggested extending our understanding of the role of trauma in violence perpetration and criminal behavior to encompass the realm of VE, but this field is in early stages of exploration (Lewis & Marsden, 2021).

2. OBJECTIVE

To date, no comprehensive synthesis of existing research investigating the relationship between ACEs and VE has been carried out. Gaining a better understanding of emerging evidence can help increase our comprehension of the extremization process, while also laying the groundwork for shaping future research. By synthesizing and critically appraising the current literature on the topic, we can understand the strengths and shortcomings in this field, identifying areas that should be prioritized in future work. In addition, identifying the key trends and hypotheses in research on the potential ACE-VE relationship can help us shape future endeavors aimed at developing interventions for the prevention of ACEs and the mitigation of their consequences, with relevance for both humanitarian and national security actions. With this scoping review, we therefore aim to synthesize current qualitative, quantitative, and mixed-methods research on the relationship between ACEs and VE, assess the quality of these studies, and highlight gaps in current knowledge as well as priorities for future research.

3. METHODS

The present scoping review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-analyses Extension for Scoping Reviews (PRISMA-ScR) (Tricco et al., 2018); see Supplementary Materials, Appendix A for the complete PRISMA checklist. The scoping review methodology was chosen to provide an overview of the current evidence base rather than answer a specific research question (Munn et al., 2018).

3.1. Search Strategy

We searched four electronic databases – APA PsycINFO, ProQuest Social Science Premium Collection, PubMed, and Scopus – to obtain literature across psychology, political science, behavioral science, and the social sciences through both field-specific and multidisciplinary sources. The search encompassed the period from the inception of the database to April 17, 2026. No language restrictions or date restrictions were applied at the search stage. The search terms covered the concepts of adversity during childhood (ACE* OR adverse childhood experience* OR adverse child experience* OR childhood trauma* OR child trauma* OR child maltreatment OR child abuse OR child neglect OR broken home*) *and* violent extremism (violent extremism* OR extremism* OR radicaliz(s)ation OR terrorism OR terrorist*), requiring both to be present. The full search string for all databases is provided in Supplementary Materials, Appendix B. To ensure that all relevant literature had been captured, electronic database searches were supplemented with a manual backward citation search of included papers and recommendations from experts in the authors' professional networks.

3.2. Eligibility Criteria and Definition of Terms

Studies were eligible when they fit the following criteria: (a) report empirical data on ACEs – whether described as adverse childhood experiences or using other terms including childhood trauma, maltreatment, abuse, neglect, or broken homes – occurring in childhood or adolescence, (b) studied individuals that were part of, either through convicted involvement or self-identification, any extremist group or ideology, (c) any study design, and (d) any location. Published and unpublished studies were considered. Papers were excluded for the following reasons: explored perceptions of ACEs and VE by third parties (e.g., counter-VE practitioners, members of community affected by VE), explored susceptibility to VE in general populations, lack of English language version, or access was not available through the academic institution. For the purposes of this scoping review, adverse childhood experiences were defined using the framework developed by Felitti and colleagues, which conceptualized ACEs as potentially traumatic events occurring before the age of eighteen including psychological, physical, or sexual abuse, domestic abuse, or living with household members who were substance abusers, suffered from mental health issues, or were imprisoned (Felitti et al., 1998). These items fall under the concepts of household dysfunction (witnessing harm or violence) and maltreatment (experiencing harm or violence) (Felitti et al., 1998). Expansions of the ACE framework, particularly within developmental and trauma research, have also incorporated broader forms of adversity, including community violence and peer victimization (Finkelhor et al., 2013). Due to the variation of types of ACEs used across the included studies, this review adopts an inclusive definition that encompasses both maltreatment and social and environmental adversities occurring during childhood to build a comprehensive scoping review. Similarly, given the variation in how VE populations were defined across studies, this review applies a broad definition of VE to guide study inclusion. Most studies specified the ideological context of the population examined (e.g., far-right, white supremacist), but some did not report a specific ideology and instead characterized participants using other indicators such as court records, clinical files, or referral to prevention/intervention services. Therefore, in the absence of an internationally accepted definition, this review draws from Gill and colleagues to define VE as a behavioral outcome encompassing both objective measures (police data, institutional records) and subjective measures (self-reported) (Borum, 2011; Gill et al., 2021). Studies that explored VE attitudes in

general population samples, or more broadly political activism, were excluded from this review on the basis that the sample studied did not directly engage in VE or extremist groups.

3.3. Study Selection, Extraction, and Appraisal

Studies that fit the search terms were screened in two stages: 1) title and abstract and 2) full text. Eligible studies were imported onto Rayyan, a web-based platform which provides researchers tools to complete literature reviews (Ouzzani et al., 2016). The first stage of screening was carried out by three authors. For 35% of records that were independently screened by a second author, there was 98% agreement on decisions; disagreements were resolved by a third author. Records that appeared to meet the inclusion criteria based on the title and abstract were retrieved in their full text versions and underwent a second screening to select those that fully met the inclusion/exclusion criteria. At the full-text stage, all records were screened by at least two authors, with 85% agreement; disagreements were resolved through discussion and consensus among the team. Those that met the inclusion criteria were extracted and appraised by four authors, with two authors then checking all extracted data for accuracy. From each included study, information of interest was collected using a piloted extraction form on ACEs prevalence, method of measurement, ACEs-VE association, and possible mechanisms driving the association. In addition, details on the study (e.g., the study design, location) and population characteristics (e.g., age range, gender) were also collected. Included studies were appraised using the Mixed Methods Appraisal Tool (MMAT), which is designed to appraise the methodological quality of empirical research using a checklist of questions that is specific to the type of study (quantitative, qualitative, or mixed method) (Hong et al., 2018).

3.4. Data Analysis and Synthesis

A narrative synthesis was employed to systematically summarize and interpret qualitative, quantitative, and mixed-method findings, identifying common themes and variations across the studies and using text to summarize and explain the findings (Popay et al., 2006). This approach was chosen due to the heterogeneity of eligible studies and outcomes, which made a meta-analysis or a purely quantitative approach unfeasible. Tabular forms were used to compare the study design and approach, population characteristics, method of ACE measurement, method of VE measurement, association between ACEs and VE, and results from the quality appraisal (see Appendices C and E).

4. RESULTS

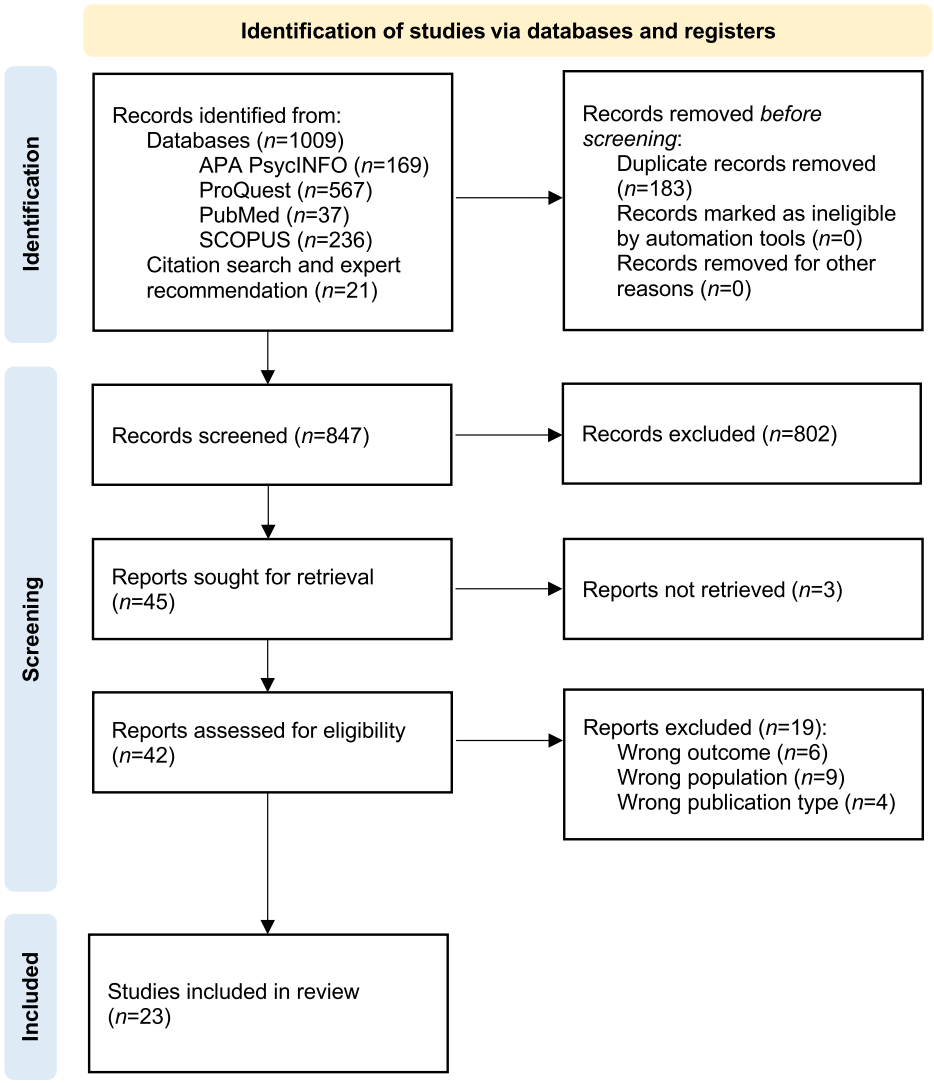
4.1. Study Selection

A total of 847 records were screened at the title and abstract stage after excluding the duplicates. We found 45 studies eligible for full-text screening; however, it was not possible to retrieve a full text for 3 of these. Of the 42 that were screened at the full-text stage, 23 met the inclusion criteria and 19 records were excluded. The primary reasons for exclusion: the variables assessed were not ACEs or proxies, they did not report empirical data (e.g., commentaries, editorials), or populations did not meet the inclusion criteria (e.g., perception of ACE-VE relationships among counter VE practitioners). Rates of attrition are noted in Figure 1. See Appendices C and D for the full list of references for included and excluded records, alongside reasoning for exclusion.

4.2. Study Characteristics

We included 23 studies analyzing ACEs and VE, with a total sample of 4,946 individuals; see Table 1 for an overview of the study characteristics. Most included studies employed a quantitative approach (n = 13), followed by mixed methods (n = 8), and then qualitative (n = 2). Among these, most used a retrospective study design (n = 15), followed by cross-sectional (n = 7), with one study utilizing a prospective design (n = 1). Most studies (n = 19) were conducted in high-income countries, with the United States being the most frequently represented. Four studies were carried out in low- middle-income countries, three of them exclusively in Iraq. Participants ranged from adolescents to older adults and included former or current members of far-left or far-right extremist groups, former white supremacists, Islamist extremists (ISIS,

Figure 1
PRISMA flowchart



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Salafi-Jihadist groups), and individuals convicted of terrorism. ACEs were measured using a wide range of methods, with semi-structured interviews and case files utilized as the most common method of data collection. The types and categories of ACEs studied varied. VE populations were identified through different pathways including self-identification with an extremist group or ideology, conviction of terrorism or extremism-related offences, or referral to countering VE services. Therefore, studies were also characterized according to how VE was conceptualized: ideological (e.g., self-identified extremist affiliation), behavioral (but unsure if individual entered the criminal justice system), criminal justice system identified extremist, or prevention/intervention-referred individual (see Table 1). However, throughout the review, VE populations are referred to retaining the terminology used in the primary sources to maintain the context in which the empirical research was conducted. In addition to ACEs and VE, studies assessed several other domains including sociodemographic information, truancy, psychopathology (e.g., PTSD, externalizing behavior disorders), and exposure to traumatic events in adulthood.

4.3. Quality of Included Studies

The MMAT was used to assess the methodological quality of the studies. The tool enables reviewers to appraise empirical studies in a single

Table 1

Characteristics of included studies

Author, year	Analytic approach	Study design	How VE population was identified	Data source	Location	Sample description	Men (%)	Mean age (*SD*) [Range]	Sample size	MMAT rating [1 To 5]
Antonelli, 2025	Quantitative	Retrospective	Criminal justice system	Pre-sentencing reports (PSR), Behavioral Risk Factor Surveillance System (BRFSS)	US	US right wing domestic violent extremists and violent offenders without extremist affiliation	97	37.10 (8.89)	207	4
Becker et al., 2022	Mixed methods	Retrospective	Criminal justice system	PIRUS dataset, SSIs	US	Political extremists radicalized in the US and gang members	100	NR	83	3
Campelo et al., 2018	Mixed methods	Prospective	Prevention/intervention referred	SSIs and secondary data such as recruit's interactions on social media, computers and phones	France	Radicalized young people followed by the CPDSI	33	19.82 (5.28) [13-40]	150	4
Carthy & Schuurman, 2024	Quantitative	Retrospective	Ideological, behavioral	SSIs, autobiographical materials, investigative files (NITV dataset)	Europe and North America (mostly US, Germany, NL, UK)	Individuals radicalized to either right-wing or jihadist extremism involved or non-involved in terrorist violence	90	1980 mean year of birth	206	3
Cleary et al., 2024	Quantitative	Cross-sectional	Criminal justice system	Semi-structured questionnaire	Iraq	Men convicted of terrorism in Iraq	100	34.10 (9.7)	160	3
Colvin & Campion, 2025	Mixed methods	Retrospective	Prevention/intervention referred	Case files	Australia	Young people previously or currently engaged in violent extremism	94	20 [13-27]	17	4
Dhumad et al., 2020	Quantitative	Cross-sectional	Criminal justice system	Semi-structured tool	Iraq	Men convicted of terrorism, men convicted of murder, members of the community with no offending history	100	34.06 (9.79)	313	3
Grimbergen & Fassaert, 2022	Quantitative	Cross-sectional	Prevention/intervention referred	Clinical SSIs	NL	Suspects of violent extremism	85	27.60 (5.50) [19-39]	34	3

Table 1 continued

Author, year	Analytic approach	Study design	How VE population was identified	Data source	Location	Sample description	Men (%)	Mean age (*SD*) [Range]	Sample size	MMAT rating [1 To 5]
Jensen & LaFree, 2016	Mixed methods	Cross-sectional	Criminal justice system	PIRUS dataset	US	Domestic extremist individuals across a range of ideologies who engaged in ideologically motivated criminal activity or had affiliations with extremist organizations	90	34.18 (13.22)	1473	4
Lankford & Silva, 2025	Quantitative	Retrospective	Criminal justice system	The Violence Project's database: official reports, court documents, news reports + added information from PIRUS, GTD, ECDB	US	Public mass shooters (1) with and (2) without extreme ideological interest	>97	(1) 30.70 (2) 34.90	193	3
Logan et al., 2022	Mixed methods	Retrospective	Ideological	SSIs	US	Self-identified former left- and right-wing extremist individuals	85	45 (11.20)	20	4
Moeller & Scheithauer, 2024	Mixed methods	Retrospective	Criminal justice system	Court files	Germany	Offenders convicted of a terrorism-related offense in Germany	91	24 (5) [15-38]	45	4
Mohammed & Neuner, 2022	Quantitative	Cross-sectional	Criminal justice system	Clinical interviews	Iraq	Adolescents & young adults incarcerated for terrorism	100	18 (2.29) [14-24]	59	3
Oppetit et al., 2019	Quantitative	Cross-sectional	Prevention/intervention referred	SSIs, group therapy with family, police investigations, computer visited websites	France	(1) Minors and (2) adults who aimed to join Islamic State, followed by CPDSI	(1) 19 (2) 45	(1) 15.82 (1.14) [13-17], (2) 23.32 (4.99) [18-40]	150	3
Schuurman & Carthy, 2023a	Quantitative	Retrospective	Ideological, behavioral	SSIs, autobiographical materials, investigative files (NITV dataset) + biographical information from the *Analysen*	NITV: Europe and North America (mostly US, Germany, NL, UK) *Analysen*: West Germany	NITV: Right-wing and Salafi-Jihadist extremists *Analysen*: Left-wing and right-wing extremists convicted or suspected of terrorism-related offenses	NITV: 90; *Analysen*: NR	NITV: 1980 mean year of birth *Analysen*: NR	456	2

Table 1 continued

Author, year	Analytic approach	Study design	How VE population was identified	Data source	Location	Sample description	Men (%)	Mean age (*SD*) [Range]	Sample size	MMAT rating [1 To 5]
Schuurman & Carthy, 2023b	Quantitative	Retrospective	Ideological, behavioral	SSIs, autobiographical materials, investigative files (NITV dataset)	Europe and North America (mostly US, Germany, NL, UK)	Individuals radicalized to either right-wing or jihadist extremism (1) involved and (2) non-involved in terrorist violence	90	Mean age at radicalization onset (1) 21.60 (6.50) (2) 18.60 (5.40)	206	4
Schuurman & Carthy, 2025	Quantitative	Retrospective	Ideological, behavioral	SSIs, autobiographical materials, investigative files (NITV dataset)	Europe and North America (mostly US, Germany, NL, UK)	(1) Terrorists (involved in violent attacks) and (2) Extremists (supported terrorism but not involved in attacks)	(1) 96 (2) 84	1980 median year of birth	206	2
Simi et al., 2016	Qualitative	Retrospective	Ideological	Life histories	US	Former members of violent White supremacist groups	86	[19-61]	44	5
Speckhard & Ellenberg, 2020	Qualitative	Retrospective	Ideological, behavioral, criminal justice system	SSIs	Across countries, including Syria, Iraq as well as European countries and US	ISIS members	83	Men: 29.95 (9.06) [14-58] Women: 27.33 (7.56) [14-49]	220	4
Stemmler et al., 2021	Mixed methods	Retrospective	Criminal justice system	Structured interviews	Germany	(1) Salafi/Jihadi Muslim prisoners and (2) Muslim prisoners without radicalization histories	100	(1) 30.54 (9.81) (2) 25.33 (4.35)	26	3
Varaine, 2023	Quantitative	Retrospective	Criminal justice system	PIRUS dataset	US	(1) Suicide and (2) non-suicide US-radicalized domestic terrorists	(1) 95 (2) 93	(1) 30 (12) (2) 33 (13)	1234	2
Weenink, 2019	Quantitative	Cross-sectional	Criminal justice system	Police files	NL	Jihadi travelers	69	Men: 24.10 Women: 23.60	319	4

Table 1 continued

Author, year	Analytic approach	Study design	How VE population was identified	Data source	Location	Sample description	Men (%)	Mean age (*SD*) [Range]	Sample size	MMAT rating [1 To 5]
Windisch et al., 2022	Mixed methods	Retrospective	Ideological, behavioral	Life histories + SSIs	US	Former members of US-based white supremacist organizations	77	41.50 (8.60) [19-61]	91	2

Note. Where not mentioned, data pertaining to age (mean, standard deviation and range) are not reported; percentages have been rounded to the nearest whole number. MMAT: Mixed Methods Appraisal Tool, NA: Not Applicable, NITV dataset: (Non-)Involvement in Terrorist Violence dataset, PIRUS dataset: Profiles of Individual Radicalization in the United States dataset, GTD: Global Terrorism Database, ECDB: Extremist Crime Database, CPDSI: Centre de Prévention contre les Dérives Sectaires liées à l'Islam, NL: the Netherlands, UK: United Kingdom, US: United States, NR: Not reported, SD: Standard deviation, SSI: Semi-structured interview.

framework with design-specific criteria evaluating key aspects of methodological rigor including suitability of approach, data collection methods, sampling strategy, risk of bias, appropriateness of statistical analysis, interpretation of results, coherence, and convergence of qualitative and quantitative components for mixed method approaches. The score can range from 0.0 to 5.0, a 5.0 indicating that all criteria have been met (Hong et al., 2018). The overall average MMAT score across all included studies was 3.30. Out of 13 studies which employed purely quantitative methods, 3 studies were rated a 4.0 (Antonelli, 2025; Schuurman & Carthy, 2023b; Weenink, 2019), 7 studies were rated a 3.0 (Carthy & Schuurman, 2024; Cleary et al., 2024; Dhumad et al., 2020; Grimbergen & Fassaert, 2022; Lankford & Silva, 2025; Mohammed & Neuner, 2022; Oppetit et al., 2019), and 3 studies were rated a 2.0 (Schuurman & Carthy, 2023a; Schuurman & Carthy, 2025; Varaine, 2023). There were 8 mixed method studies, out of which 5 were rated a 4.0 (Campelo et al., 2018; Colvin & Campion, 2026; Jensen et al., 2016; Logan et al., 2022; Moeller & Scheithauer, 2024), 2 were rated a 3.0 (Becker et al., 2022; Stemmler et al., 2021), and 1 was rated a 2.0 (Windisch et al., 2022). A purely qualitative approach was used the least with just 2 studies, one rated a 5.0 (Simi et al., 2016) and one appraised with a score of 4.0 (Speckhard & Ellenberg, 2020). Hence, qualitative studies received the highest MMAT mean scores (4.5), with mixed method papers scoring on average the second highest (3.5), and quantitative studies scoring the lowest (3.0). It is worth noting that the qualitative components of the mixed method papers all scored a 4.0 or 5.0. The criteria for quantitative papers place a stronger emphasis on methodological rigor and assess the study on the sample being representative of the target population, completeness of outcome data, controlling for confounding variables, and low risk of nonresponse bias. Even if these factors are discussed as limitations by the authors, the study is still assessed against these criteria; many studies failed to meet the criteria for low non-response bias and/or basing their study on a sample representative of the target population. An overview of the ratings is reported in Table 1, while the complete table with all criteria can be found in Supplementary Materials, Appendix E.

4.4. ACEs Characteristics in Left-wing Extremists, Right-wing Extremists, and White Supremacists

The most prevalent ACEs among US right-wing extremists were caregiver loss (70%), caregiver substance abuse (70%), witnessing domestic violence (60%), emotional neglect (50%), emotional abuse (50%), and physical abuse (50%); 70% reported four or more ACEs (Logan et al., 2022). A sample of US right-wing violent extremists reported similarly with divorce (73%), household substance abuse (58%), household member struggling with mental illness (51%), physical abuse (49%), and incarcerated family member (42%) as ACEs (Antonelli, 2025). Among a sample of right- and left-wing extremists, 33% reported having experienced severe familial conflict and 26% having experienced the loss of a caregiver (Schuurman & Carthy, 2023a).

In a sample of US left-wing extremists, caregiver loss (70%), emotional neglect (60%), caregiver substance abuse (50%), and witnessing domestic violence (40%) were among some of the ACEs reported; 50% reported four or more ACEs (Logan et al., 2022). Further, 25% of left-wing extremists reported growing up in a broken home (Schuurman & Carthy, 2023a).

Among former white supremacists, 63% experienced four or more ACEs with caregiver loss (68%) and caregiver substance abuse (66%) as the most commonly reported, followed by physical abuse (48%) (Windisch et al., 2022). In a separate study involving white supremacists, 51% reported three or more ACEs, and some of the most prevalent ACEs included living in households with family disruption (defined by the authors as “divorce, deceased parents, or parents who were never married”) (73%), witnessing of serious violence (64%), and household substance abuse (59%) (Simi et al., 2016). Overall, among left- and right-wing extremists, as well as white supremacists, the most reported ACEs related to household dysfunction, followed by experiences of maltreatment.

4.5. ACEs Characteristics in Islamist Violent Extremists

Among current and former members of Islamist violent extremist groups, similar trends can be identified. From a sample of Jihadi travelers from the Netherlands, 49% were from single-parent families, which Weenink categorized as a childhood adversity (Weenink, 2019). Similarly, among individuals convicted of Islamic terrorism in Germany, 49% had experienced parental separation before adulthood (Moeller & Scheithauer, 2024). In addition, it was noted that during childhood, 11% of the sample experienced violent behavior from a primary caregiver, while 4% experienced a racially motivated assault, and 2% were a victim of sexual assault (Moeller & Scheithauer, 2024). High rates of physical or sexual abuse (30%), neglect or psychological abuse (87%), and abandonment (77%) were also found in a sample of adolescents aiming to join ISIS (Oppetit et al., 2019). Additionally, 31% had experienced parental drug abuse, and 41% had grown up with a depressed relative (Oppetit et al., 2019). In a sample of radicalized Muslim prisoners, 64% had experienced violent childrearing practices, such as excessive corporal punishment, while around half (55%) had lost their father due to death or separation (Stemmler et al., 2021). In a Jihadist sample, 61% grew up in a "familial environment characterized by fractured relationships, lack of emotional warmth, and/or frequent conflict", and 7% of Jihadists lost parents before the age of 21 (Schuurman & Carthy, 2023a). In a sample of radicalized young people from France, neglect or psychological abuse (85%), abandonment (82%), and depression in a relative (41%) were reported as occurring before radicalization. It should be noted that although the age range of this sample characterized as "young people" was 13 to 40 years, the timeframe of these events was not specified beyond "history before radicalization" (Campelo et al., 2018). In a sample of adolescents and young adults who were incarcerated for terrorism, being hit (81.4%), witnessing family members being hit (50.8%), and being told they were a bad son (50.8%) were the most commonly reported events (Mohammed & Neuner, 2022). Along the same lines, among former and current ISIS members, family conflict, parental death, household substance abuse or mental disorders, and exposure to domestic violence were experienced in childhood (Speckhard & Ellenberg, 2020).

4.6. ACE Characteristics in Mixed Samples or Those With Unspecified Ideology

Consistent results are also observed in studies with mixed populations where results were not reported separately by group. In a sample of young people in Australia who previously or currently engaged in right-wing extremism or Salafi-jihadism, 70% experienced ACEs. Although statistics for all types of ACEs were not specified, witnessing or experiencing violence (41%), deprivation and poverty, imprisonment of a family member, sexual abuse, witnessing death, and witnessing the effects of war were reported (Colvin & Campion, 2026). Along those lines, among right-wing, left-wing, single issue and Islamist extremists, 35% had four or more ACEs, and the three most reported were emotional neglect (47%), household mental disorders (44%), and caregiver loss (38%) (Grimbergen & Fassaert, 2022). High rates of broken families (45%) were also noted among a sample of political extremists across the spectrum (Becker et al., 2022). In a sample of radicalized individuals across Europe and North America, 86% of those involved in terrorist violence, and 74% of those not involved in terrorist violence, reported an ACE (Schuurman & Carthy, 2025). Furthermore, in considering a group of mass shooters driven by extreme ideologies, 33% were found to have experienced some form of child trauma, including physical, sexual, emotional abuse, or parental suicide or death during childhood (Lankford & Silva, 2025). In a study exploring differences between non-suicide and suicide domestic terrorists in the US, prevalence of child abuse ranged from 4% in non-suicide terrorists to 20% in suicide terrorists (Varaine, 2023). Similarly, suicide terrorists presented higher prevalence of caregiver absence (67%) compared to non-suicide terrorists (33%) (Varaine, 2023).

4.7. Comparisons With Control Groups

While the rates of ACEs in these high-risk populations appear to be higher than the base rate in

the general population, relatively few studies included control groups; where control groups were included, they ranged from high risk (e.g., other violent offenders) to low risk populations (e.g., community members) and results were mixed. Within a sample that included comparisons between right-wing domestic violent extremists (DVE), violent offenders (VO), and general population statistics, both the DVE (M = 3.24, SD = 1.76) and VO group (M = 2.74, SD = 1.63) had significantly higher mean ACE scores than the general population (M = 1.60), and DVEs had a higher mean ACE score than VOs (p<.05) (Antonelli, 2025). Similarly, both extremists (74%) and terrorists (86%) were reported to have experienced ACEs more commonly than the general population (38-39%) (Schuurman & Carthy, 2025). In contrast, several other studies showed the rate of ACEs was not significantly higher in the VE group than the non-VE group. Political extremists were no more likely to come from broken homes than a control group of gang members (Becker et al., 2022), and the number of ACEs experienced was not significantly different between individuals who radicalized and became involved in terrorist violence verses those who radicalized but did not become involved in terrorist violence (Carthy & Schuurman, 2024). In Iraq, there was no significant difference in the prevalence of childhood physical abuse or emotional neglect between incarcerated offenders convicted of terrorism, incarcerated offenders convicted of murder, and community members without criminal history (Dhumad et al., 2020). Similarly, the difference in childhood trauma rates reported between extremist mass shooters (33%) and non-extremist mass shooters (20%) was not statistically significant (Lankford & Silva, 2025). Further, non-radicalized Muslim inmates actually showed higher rates of violent punishment in childhood (77%) than radicalized Muslim inmates (64%) (Stemmler et al., 2021). In the PIRUS database (Profiles of Individual Radicalization in the United States), 2-4% of profiles across right-wing, left-wing, single issue, and Islamic extremism demonstrated evidence of history of abuse as a minor (Jensen et al., 2016), a rate much lower than the US national prevalence for physical abuse of 23% (Swedo et al., 2023). This discrepancy in findings may reflect the coding methodology employed for the PIRUS database where cases with missing information were coded as “no evidence of abuse as a minor” (Jensen et al., 2016). Overall, the evidence suggests that the link between ACEs and violence may be population specific, though methodological differences between studies make it hard to draw firm conclusions.

4.8. Association Between ACEs and VE

Four studies reported on the relationship between ACEs and VE. Adverse childhood experiences and involvement in terrorist violence were significantly associated (as reported by the authors: x^2 = 4.07; OR = 2.08; $p \leq 0.05$) in populations of radicalized individuals across North America and Europe (Carthy & Schuurman, 2024; Schuurman & Carthy, 2023b). Along these lines, among residents of a juvenile prison in Iraq, a significant association between violence perpetration committed during their time in ISIS and childhood and adolescent exposure to war events (r = 0.446, p < 0.01), general traumatic events (r = 0.601, p < 0.01), and ISIS-related traumatic events (r = 0.771, p < 0.01) was found, all statistics as reported by the authors (Mohammed & Neuner, 2022). However, this should be interpreted cautiously – the ages of the participants ranged from 14-24, and there is uncertainty whether these events occurred concurrently. In contrast, childhood abuse was not statistically significantly associated with participation in violence in a sample of extremist individuals from the US (Jensen et al., 2016), nor was there a statistically significant association between childhood abuse and terrorism in a sample of Iraqi prisoners and community controls (Dhumad et al., 2020).

4.9. Pathways and Mechanisms of Action

Few studies discussed frameworks that could explain how adversity in childhood is associated with extremism on a hypothetical level and only two studies formally tested possible mechanisms. The most reported hypothesis is one presented by Simi and colleagues, then adopted in two other studies (Logan et al., 2022; Simi et al., 2016; Windisch et al., 2022). In this framework, ACEs are thought to contribute to the parallel

rise of (a) negative emotionality (e.g., anger, depression) and (b) adolescent conduct problems (e.g., aggressive behaviors, truancy), which in turn contribute to participation in extremist groups as a coping mechanism in the attempt to seek social support (Logan et al., 2022; Simi et al., 2016; Windisch et al., 2022). Becker and colleagues discuss theories based on the idea that social factors play a central role in linking ACEs to VE (Becker et al., 2022). Through analysis of life stories and semi-structured interviews (Becker et al., 2022), they highlight how physical abuse, parental divorce, and emotional abuse can act as barriers to the formation of prosocial bonds during the first decades of life. Entry into VE groups can therefore act as a coping mechanism to access a social environment in the absence of family or community ties (Becker et al., 2022). Another view is presented by Mohammed and Neuner, who highlight how exposure to adversity from a young age can lead to an overall habituation to violence, which can then predispose individuals to higher perpetration of violence (Mohammed & Neuner, 2022).

Perhaps related to social exclusion, Carthy and Schuurman test the theory and find that, among radicalized individuals in Europe and North America, abandonment of education was a moderating factor increasing the likelihood of ACEs culminating in involvement in terrorist violence ($p < 0.05$) (Carthy & Schuurman, 2024). Enrollment in education is therefore suggested as a potential protective pathway to mitigate the impact of ACEs on violent extremist behavior.

Cleary and colleagues explored potential developmental pathways toward VE using quantitative modeling. They employed a path analysis to examine the hypothesized relationship between childhood exposures and the severity of terrorism behavior among those convicted of terrorism in Iraq, showing potential indirect pathways between ACEs and the severity of VE behavior. It should be noted that this study was based on cross-sectional data and causal and directional conclusions cannot be drawn from a mediation analysis. The authors reported the following findings (all reported values were statistically significant and are noted here in the same language as they were by the authors): adverse childhood experiences had a significant positive effect on childhood conduct disorder ($\beta = 0.45$, $p < 0.0001$), which in turn had a significant positive effect on anti-social personality disorder ($\beta = 0.62$, $p < 0.0001$), which then had a significant positive effect on attitudes towards terrorism ($\beta = 0.37$, $p < 0.0001$). Attitudes towards terrorism were found to have a significant direct effect on the severity of terrorist behavior ($\beta = 0.19$, $p < 0.05$); however, the authors report the direct path between ACEs and severity of terrorism behavior was not statistically significant. ACEs also had a significant positive effect on religion as a guiding principle ($\beta = 0.18$, $p < 0.01$), which in turn had a direct effect on severity of terrorism behavior ($\beta = 0.24$, $p < 0.01$), offering another potential pathway between ACEs and VE (Cleary et al., 2024). Additionally, the authors noted that due to the sample consisting only of those who had engaged in acts of terrorism, this cannot tell us about the likelihood of these factors *not* leading to VE behavior.

5. DISCUSSION

This scoping review aimed to provide an overview of the literature on adversity during childhood and its relation to VE, critically evaluating its quality. We included 23 studies on individuals supporting a range of right and left wing, Islamist, and other extremist groups and ideologies. Most studies employed quantitative (descriptive) methods, followed by mixed methods and qualitative. Quality ratings were variable, with an average score of 3.3 out of 5.0 across all studies. Overall, the most common ACEs were related to household dysfunction (such as caregiver loss or imprisonment, caregiver mental or substance disorders, and witnessing violence) followed by experiences relating to maltreatment (such as emotional neglect, and physical and sexual abuse). ACEs were mostly reported at much higher prevalence than seen in general population samples (Antonelli, 2025; Schuurman & Carthy, 2025) but were not necessarily higher than rates seen in control samples that included prisoners, gang members, and community controls (Becker et al., 2022; Carthy & Schuurman, 2024; Dhumad et al., 2020). This

Table 2

Overview of variables and results from all studies

Study	Sample	ACE measure	ACE prevalence in VE groups	ACE prevalence in control groups (if relevant)	Did ACE prevalence differ between groups?	Association between ACEs and measure of VE	Mechanisms of action
Studies with control or comparison groups							
Antonelli, 2025	(1) Right-wing domestic violent extremists (2) violent offenders (3) comparison to national statistics	Physical/verbal/sexual abuse, domestic violence, parental divorce/incarceration/substance abuse/mental illness	(1) 51% mentally ill household member, 58% household substance use, 42% incarcerated family member, 73% divorce, 49% physical abuse	(2) 45% mentally ill household member, 39% household substance use, 20% incarcerated family member, 62% divorced parents, 37% physical abuse (3) 17% mentally ill household member, 27% household substance abuse, 9% incarcerated family member, 28% divorced parents, 23% physical abuse	Statistically significant differences ($p < 0.05$) between: (1) and (2) in total ACE score, basic needs met, drugs in the home, domestic violence, household incarceration, and divorce (1) and (3) in total ACE score, household mental illness, household substance abuse, household incarceration, divorce, domestic violence, basic needs met, sexual and physical abuse	NA	NR
Becker et al., 2022	(1) Political extremists (2) gang members	Broken family, poor family connections	(1) 45% broken families, 26% poor family connections	(2) 44% broken families, 44% poor family connections	No statistical difference	NA	*Hypothesis (not tested): ACES may affect formation of pro-social bonds during childhood.* *VE groups could be a coping mechanism to access a social environment in the context of poor social bonds*

Table 2 continued

Study	Sample	ACE measure	ACE prevalence in VE groups	ACE prevalence in control groups (if relevant)	Did ACE prevalence differ between groups?	Association between ACEs and measure of VE	Mechanisms of action
Carthy & Schuurman, 2024	Right-wing or Jihadist radicalized individuals (1) involved or (2) non-involved in terrorist violence	Physical abuse, neglect, household mental illness, divorce, or parental separation	86% were coded as "present" for ACEs	74% were coded as "present" for ACEs	The overall presence of ACEs in radicalized individuals involved in terrorist violence vs those not involved in violence (OR = 2.08 $p < .05$)		Continuation of education moderated risk posed by ACEs
Dhumad et al., 2020	(1) Incarcerated terrorist offenders (2) offenders convicted of murder (3) community members with no offending history	Physical abuse, emotional neglect, harsh treatment by parents or others, authoritarian father	(1) 18% physical abuse, 16% emotional neglect, 10% harsh parental treatment	(2) 16% physical abuse, 17% emotional neglect, 6% harsh parental treatment (3) 17% physical abuse, 14% emotional neglect, 26% harsh parental treatment	No statistical difference between groups for childhood abuse or emotional neglect (3) more likely than (1) and (2) to experience harsh treatment by parents (X^2=18.9, df = 2, $p < 0.0001$)	No association observed	NR
Lankford & Silva, 2025	US public mass shooters (1) with extreme ideological interest (2) without extreme ideological interest	"Childhood trauma" measure: physical/ emotional/sexual abuse, parental suicide or parental death	(1) 33% childhood trauma	(2) 20% childhood trauma	No statistically significant difference between groups in childhood trauma frequency	NR	NR
Stemmler et al., 2021	(1) Muslim extremist prisoners (2) Muslim non-extremist prisoners	Violent child rearing practices, death of a father, or separation of parents	(1) 64% violent childrearing practices, 55% lost their father	(2) 77% violent childrearing practices, 39% lost their fathers	Differences not tested statistically / NR	NR	NR
Studies without control groups							
Campelo et al., 2018	Radicalized young people	Physical or sexual abuse, death of a relative, physical or mental health issue in relative	85% neglect or psychological abuse, 82% abandonment, 41% depression in a relative *	NA	NA	NR	NR

Table 2 continued

Study	Sample	ACE measure	ACE prevalence in VE groups	ACE prevalence in control groups (if relevant)	Did ACE prevalence differ between groups?	Association between ACEs and measure of VE	Mechanisms of action
Cleary et al., 2024	Men convicted of terrorism in Iraq	Neglect, physical, sexual, emotional abuse, authoritarian father	NR	NA	NA	ACEs → attitudes to terrorism (β = 0.19, $p < 0.01$)	ACEs → conduct disorder (β=0.45, $p < 0.0001$) → anti-social personality disorder (β = 0.62, $p < 0.0001$) → attitudes towards terrorism (β = 0.37, $p < 0.0001$). ACEs → religion acting as a guiding principle (β = 0.18, $p < 0.01$), ACEs → attitudes towards terrorism (β = 0.19, $p < 0.01$) Attitudes towards terrorism → severity of terrorism behavior (β = 0.19, $p < 0.05$)
Colvin & Campion, 2025	Young people previously or currently engaged in violent extremism	War exposure, deprivation, domestic violence, violent/chaotic childhoods, witnessed death/dead bodies, family death or imprisonment	70% of case files (12 of 17) contained evidence of ACEs	NA	NA	NA	NR
Grimbergen & Fassaert, 2022	Suspects of violent extremism	Physical abuse, sexual abuse physical/emotional neglect, household incarceration/ substance abuse/mental health problems/ domestic violence and loss of a parent	35% exposed to 4+ ACES, 47% emotional neglect, 44% household mental illness, 38% loss of parent	NA	NA	NA	NR
Jensen & LaFree, 2016	US extremist individuals from a range of ideologies	Verbal, physical, or sexual abuse by a family or non-family member	3% abuse (average across ideologies)	NA	NA	Childhood abuse not significantly associated with ideological category $\chi^2 = 1.37$, $p = .771$	NR

Table 2 continued

Study	Sample	ACE measure	ACE prevalence in VE groups	ACE prevalence in control groups (if relevant)	Did ACE prevalence differ between groups?	Association between ACEs and measure of VE	Mechanisms of action
Logan et al., 2022	Self-identified former (1) left-wing and (2) right-wing extremists	Abuse, neglect, parental separation/divorce, household physical violence/substance abuse/mental illness or suicide attempt, incarcerated household member	(1) 50% experienced four or more, 70% caregiver loss, 50% caregiver substance abuse, 40% witnessed domestic violence, 60% emotional neglect (2) 70% experienced four or more, 70% caregiver loss, 70% caregiver substance abuse, 60% witnessed domestic violence, 50% emotional neglect, 50% physical abuse, 50% emotional abuse	NA	NA	NA	NR
Moeller & Scheithauer, 2024	German individuals convicted of terrorism-related offense	Parental separation, caregiver violence, racially motivated assault, drug abuse	49% parental separation, 11% violent behavior from a caregiver, 4% racially motivated assault, 2% victim of sexual assault	NA	NA	NA	NR
Mohammed & Neuner, 2022	Adolescents & young adults incarcerated for terrorism	Childhood Family Violence Scale: physical/verbal/sexual violence, neglect War and Adversity Exposure Checklist: food and water deprivation, loss of loved ones 'Trauma exposure' composite consisting of family violence, war events, ISIS-related events	81% physical abuse, 51% witnessed family members hit, 51% told they were a bad son	NA	NA	Childhood/adolescence exposure to war and violence perpetration (r = .446, p < 0.01) Trauma exposure and violence perpetration (r = .601, p < 0.01)	*Hypothesis (not tested): ACEs = habituation to violence, predisposing individuals to a higher perpetration of violence*
Oppetit et al., 2019	French (1) minors and (2) adults who aimed to join Islamic State	Physical/sexual abuse, neglect or psychological abuse, abandonment, substance abuse or relative, depression of a relative, health issue of relative	(1) 30% physical or sexual abuse, 87% neglect or psychological abuse, 77% abandonment, 31% parental drug abuse, 41% depressed relative, 29% health issue of relative *	NA	NA	NA	NR

Table 2 continued

Study	Sample	ACE measure	ACE prevalence in VE groups	ACE prevalence in control groups (if relevant)	Did ACE prevalence differ between groups?	Association between ACEs and measure of VE	Mechanisms of action
Schuurman & Carthy, 2023a	Left-, right-, and jihadist extremists and terrorists	Divorce/separation of parents, conflicts with parents, broken home before age 14, poor family cohesion, criminal antecedents, parental death	*Analysen*: 33% familial conflict (left/right-wing), 26% loss of a caregiver & 25% broken home (left-wing) NITV: 52% right wing extremist & 48% of jihadists separated/divorced parents, 58% right wing extremist & 61% jihadists fractured/conflict filled/cold family, 12% right-wing extremists & 7% jihadists lost parents before age 21	NA	NA	NA	NR
Schuurman & Carthy, 2023b	Right-wing or Jihadist radicalized individuals (1) involved or (2) non-involved in terrorist violence	Victimization, serious illness, stability of household relationships, safe/nurturing home environment	ACEs among those involved in terrorist violence: 86% ACEs among those not involved in terrorist violence: 74%	NA	NA	ACEs → involvement in terrorist violence (χ^2: 4.07; OR: 2.08; $p \leq 0.05$; OR: −0.06, $p > .05$ when controlling for covariates)	NR
Schuurman & Carthy, 2025	(1) Terrorists (involved in violent attacks) and (2) Extremists (supported terrorism but not involved in attacks)	NR	ACE exposure: (1) 86 % (2) 74%	NA	NA	NA	NR
Simi et al., 2016	Former members of violent US White supremacist groups	Physical/sexual abuse, emotional/physical neglect, abandonment, parental incarceration, witnessed serious violence, household substance abuse, family disruption, family mental health problems, abandonment	84% reported one or more and 51% reported three or more ACEs: 43% physical abuse, 23% sexual abuse, 41% neglect, 27% parental incarceration, 73% family disruption, 64% witnessed serious violence, 59% household substance abuse	NA	NA	NA	*Hypothesis (not tested): ACEs contribute to (a) increased negative emotionality and (b) adolescent conduct problems, increasing participation in extremist groups for social support*

Table 2 continued

Study	Sample	ACE measure	ACE prevalence in VE groups	ACE prevalence in control groups (if relevant)	Did ACE prevalence differ between groups?	Association between ACEs and measure of VE	Mechanisms of action
Speckhard & Ellenberg, 2020	ISIS members	Abuse, neglect, domestic violence, household substance abuse/mental illness/incarceration, parental separation/divorce, death of a parent, family conflict	Men: 9% parental separation, 9% family conflict, 12% deceased parent Women: 8% emotional abuse, 8% physical abuse, 3% sexual abuse, 21% parental separation, 8% household substance abuse, 24% family conflict, 5% domestic violence exposure	NA	NA	NA	NR
Varaine, 2023	Suicide and non-suicide domestic terrorists radicalized in US	Verbal or physical abuse, parental absence (separation, divorce, death)	Child abuse: 20% (suicide terrorists), 4% (non-suicide terrorists) Caregiver absence: 67% (suicide terrorists), 33% (non-suicide terrorists)	NA	NA	NA	NR
Weenink, 2019	Jihadi travelers from the Netherlands	Single-parent families (divorce, death of parent)	49% part of single-parent household	NA	NA	NA	NR
Windisch et al., 2022	Former members of US-based white supremacist organizations	Abuse, neglect, witnessed domestic violence, caregiver substance abuse/loss/mental illness/incarceration	68% caregiver loss, 66% caregiver substance abuse, 48% physical abuse, 47% witnessed domestic abuse, 47% caregiver mental illness, 46% emotional neglect, 46% emotional abuse	NA	NA	NA	NR

Note. * These two studies include the same sample of young people followed by the CPDSI (see Table 1), framed according to the study objective. For the study by Oppetit et al., only data from the minors is presented; adult reports of adverse experiences were not necessarily restricted to childhood. For the study by Campelo et al., these adverse experiences of young people are reported to have occurred before radicalization, although the time frame is not specified. Statistics were taken directly from the literature and are presented here using the same notation and format employed by the original authors; percentages have been rounded to the nearest whole number. NA: Not applicable, NR: Not reported.

suggests evidence of multifinality: ACEs may be associated with VE in some people but can also lead to a range of other adverse outcomes (e.g., criminality). For this reason, as well as the lack of causal data, ACE scores alone cannot identify which individuals will participate in violence and cannot be reliably used as a screening tool that will predict VE behavior. Research is needed to understand the conditions under which ACE increases the risk of VE.

Four studies found positive and significant correlations between ACEs and VE (Carthy & Schuurman, 2024; Cleary et al., 2024; Mohammed & Neuner, 2022; Schuurman & Carthy, 2023b). One study did not observe ACEs to be linked to participation in violence among an extremist sample (Jensen et al., 2016), and one study reported no association between ACEs and VE attitudes (Dhumad et al., 2020). These differences in findings could be explained by the various methodological approaches of these studies, i.e., retrospective versus cross-sectional. Relying on retrospective self-reports may have biased the reporting of ACEs, possibly overestimating their association (Baldwin et al., 2019; Danese, 2020). The discrepancies may also relate to the types of ACEs studied: Dhumad and Jensen focused primarily on ACEs that can be categorized as childhood abuse rather than family dysfunction, suggesting that adverse experiences related to the household may carry higher risk.

Regarding the possible developmental processes relating ACEs to VE, only two studies formally assessed data to identify the strength of associations between risk factors and outcomes through path analysis, both basing the analysis on quantitative data (Carthy & Schuurman, 2024; Cleary et al., 2024). Cleary et al. (2024) sampled men who had already been convicted of terrorism offences and were held in an Iraqi prison. They used path analysis to explore pathways to terrorist behaviors, finding evidence for several potential mediating pathways between ACEs and severity of terrorist acts committed. One path involved ACEs to childhood conduct disorder to antisocial personality disorder in adulthood to terrorism attitudes, and finally to severity of terrorism. There was also a direct path from ACEs to terrorism attitudes. There was also a path with significance from ACEs to the extent to which religion was a guiding principle to severity of terrorism (Cleary et al., 2024). It is important to highlight here that this analysis was conducted on cross-sectional data and causality and direction cannot be proven. In the other study, Carthy and Schuurman (2024) found that continuation in education moderated the association between ACEs and involvement in terrorist violence in radicalized individuals (Carthy & Schuurman, 2024). This highlights the role of protective factors having the potential to buffer the impact of ACEs on subsequent development. Psychopathology and social level factors may be central in the pathways linking ACEs to VE.

Although untested, three studies proposed potential mechanisms, most highlighting how ACEs might increase vulnerability to mental disorders and impair social level outcomes, thereby making individuals with ACEs more vulnerable to supporting VE groups and activities (Becker et al., 2022; Mohammed & Neuner, 2022; Simi et al., 2016). These different frameworks hypothesize distinct mechanisms of actions and recognize that mental health symptoms may play a role in making some individuals more vulnerable to participation in VE groups and activities. Similarly, social exclusion and impaired social bonds are commonly presented as potentially important vulnerabilities. More specifically, involvement in VE groups could act as a coping mechanism to overcome the social exclusion experienced by adults who have had ACEs, and this could occur first through association with more general criminal groups, which could in turn lead to these VE environments. It should be acknowledged that ACEs alone do not determine which individuals will participate in violence, but more so ACEs may be a contributing factor in the pathway to radicalization and subsequent involvement in VE activities.

Despite the growing body of evidence on ACEs and VE, we note significant heterogeneity and gaps in the literature. The definitions used for ACEs and VE varied greatly across studies. A wide range of ACEs were assessed, ranging from household dysfunction and child maltreatment

to being a victim of crime and exposure to war. One study also included parents who never married as an indicator of family disruption. However, this may not necessarily be considered or perceived as an adversity in every culture, limiting comparability of findings across different populations. Furthermore, ACEs are often measured as the presence or absence of each type of ACE, but this likely loses important information about the severity, chronicity, and impact of adversity. Dimensional measures that capture variance in these experiences would allow a more nuanced exploration of the role of ACEs in developmental pathways towards VE. VE was also conceptualized in various ways, ranging from conviction for terrorism offences, to those intending to join an extremist group, to self-reporting as an extremist, depending on the type of sample used. Additionally, different investigations employed diverse approaches (e.g., qualitative, quantitative, mixed) and methods (e.g., semi-structured interviews, life-history interviews, surveys) to measure these two dimensions. Most studies did not include control groups, and where control groups were used, they consisted of varying populations with mixed results. Hence, it is not clear the extent to which ACEs were more common than would be expected by chance. Control groups drawn from similar neighborhoods, controlling for factors such as socioeconomic status, will be necessary to establish how consistently certain types of ACEs precede VE. These methodological variations pose challenges in comparing and synthesizing the results across studies, especially when statistical analyses and datasets were not made publicly available by all authors. We would therefore urge researchers to make materials open access to support reproducibility and help improve methodology across the field. Further gaps pertain to study design and study quality. Most investigations analyzed data based on retrospective recall, which relies on cross-sectional correlational data and can be prone to recall bias. This also limits the ability to draw causal conclusions, which would require well-designed longitudinal studies. Overall, many papers fail to evaluate potentially mediating and moderating factors in the relationship between ACEs and VE. ACEs may also co-occur with other risk factors for VE and so studies that control for confounding factors, and model the interplay between factors over time, will be necessary to understand potential causal pathways. Another gap relates to the geographical scope of included studies. Most investigations were conducted in a handful of high-income countries, limiting the generalizability of findings to LMICs, and further, to fragile and conflict-affected areas where children are likely to experience a wide range of adversities.

In addition to shortcomings at the level of the studies included, the findings of this review should be interpreted considering some limitations as well. Given the scoping nature of this review, the search was limited to the four databases that were most relevant and available through the academic institution. As such, it is possible that some literature on the topic, including grey literature, was missed due to selection bias and publication bias. We attempted to mitigate this by including studies in the screening process which were recommended by experts in the field. In addition, although a second reviewer checked all extracted data to minimize the likelihood of errors, formal inter-rater reliability statistics were not calculated, limiting the ability to quantify accuracy.

Several recommendations for future research flow from these findings. To enhance the comparability of findings across studies, consistent definitions and standardized and validated assessment tools should be employed for the assessment of both ACEs and VE-related outcomes. When measuring ACEs, items representing both the maltreatment and household dysfunction categories should be assessed. Further, ACE measures designed for Western, high-income contexts may not accurately capture adversities experienced in non-Western settings, such as specific forms of chronic and collective adversities occurring in conflict-affected contexts; validated and context-specific measures of ACEs are required. Expanding the geographical scope of investigations is also a crucial step to enhance the overall quality of evidence in the field. Conducting further research in LMICs, and conflict-affected areas, would provide a more comprehensive understanding of the ACEs-VE

relationship across contexts, ensuring that the development of future intervention efforts is based on a less biased body of knowledge. Lastly, the adoption of prospective longitudinal designs would allow researchers to explore causality and shed light on the nature of the ACE-VE relationship, with the potential to investigate mediators and moderators of their relationship. This would allow for the developmental pathways linking ACEs to VE, that to date have been mostly hypothesized on a theoretical level, to be tested. However, this may be difficult to implement in practice as participant retention, low rates of VE in general populations, and ethical concerns around selecting populations for such studies would pose challenges.

6. CONCLUSION

This scoping review reports on the literature exploring the links between ACEs and VE. The findings indicate a growing body of evidence on if and how adversity in childhood might be related to VE later in life, assessed using a variety of measures and approaches. There were a few findings that supported the link between ACEs and VE: 1) when it comes to types of ACEs, the ones that fall under household dysfunction seem to be more prevalent across different extremist groups than those that fall under the category of maltreatment; 2) the prevalence of ACEs in extremist groups seems to be on average higher than in the general population; 3) some studies found a positive and significant association between ACEs and VE. However, the evidence linking ACEs and VE is inconsistent, with other studies showing the rates of ACEs are no higher in VE groups than in violent non-extremist or community control samples, and further, some studies showing no significant association between ACEs and VE at all. It is not clear based on existing evidence if these discrepancies reflect differences between populations or different methodologies used in different studies. Regardless of these uncertainties, it is worth noting that the majority of those affected by childhood adversity do not become involved in VE. It will be necessary to conduct research in representative population samples to fully understand why a minority of those with ACEs become involved in VE. In addition, the current evidence is highly heterogeneous, and some are of limited quality. Our review underscores the need for standardized definitions and assessment methods, with more rigorous research aimed at exploring the potential causality and developmental pathways in the ACE-VE relationship, as well as research beyond HICs. Improving the quality and scope of the research is essential to provide data that can be used to guide the development of targeted interventions that can support young people most at risk of becoming involved in VE.

7. DECLARATIONS OF INTEREST

The authors declare no competing interests.

8. AUTHOR CONTRIBUTIONS

CC, FM, NH designed the review approach. CC and TP conducted literature search. CC, TP, SH, and JC conducted the screening, extraction, quality appraisal processes and data analysis. FM and NH provided oversight and resolved conflicts in these processes. CC and TP drafted the manuscript. All authors contributed to critical revision of and approved the final manuscript.

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11. DATA AVAILABILITY STATEMENT

Supplementary online materials are available at: https://osf.io/ekdqh/

12. CONFLICTS OF INTEREST

The authors declare no competing interests.

13. SUPPLEMENTARY MATERIALS

The supplementary materials can be found here.

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