

Original Paper

Adverse Childhood Experiences and Neighborhood Characteristics: A Systematic Review

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Abstract

Adverse childhood experiences (ACEs), including abuse and neglect, are strongly associated with children’s long-term development and have become a global policy priority. Although existing research has highlighted the predictive effects of ACEs and neighborhood characteristics on individual health outcomes, there is still a lack of systematic integration and review of evidence on the association between neighborhood characteristics and ACEs, which is critical to understanding child development. Following the PRISMA guidelines, we searched four major databases, screened the search results from 1999 to 2025, and used standardized tools for quality assessment. Ultimately, we identified 39 pieces of evidence and conducted a systematic review of these 39 studies, narratively summarizing the research findings. This review incorporates multidimensional neighborhood characteristics into the theoretical framework with the aim of exploring the association between neighborhood structural characteristics (such as poverty, racial diversity, safety, and resource accessibility) and non-structural characteristics (such as collective efficacy) with ACEs. The research results indicate that there is a significant association between neighborhood characteristics and ACEs risk. Therefore, considering neighborhood characteristics when developing ACEs intervention and prevention policies and strategies can help ensure the comprehensiveness of the plan.

Keywords

Adverse childhood experience, Children development, Structural Characteristics, Nonstructural Characteristics, Systematic review

1. Introduction

Adverse Childhood Experiences (ACEs) refer to a variety of traumatic and stressful events experienced by children ages 0 to 18 (Felitti et al., 1998). ACEs are defined by: physical and psychological abuse and neglect; sexual abuse; family member's substance abuse, incarceration, and mental illness; intimate partner violence and parental separation/divorce (Maguire-Jack & Showalter, 2016). Studies have found that nearly half of the children experienced at least one ACE. These experiences can have a profound impact on children's health risks, such as brain damage, cancer and diabetes, as well as impairing mental health and leading to social adjustment challenges in adulthood (Anda et al., 2006; Belis et al., 2015; Herzog & Schmahl, 2018; Bick & Nelson, 2016). Not only that, but ACEs also cause social-level impacts, such as increased healthcare expenditures and continued deterioration of the health of vulnerable populations in their later years (Peterson et al., 2023; Canizares et al., 2018). Therefore, many countries have made ACEs a policy priority and incorporated ACEs prevention into their practices.

Neighbourhood are defined as geographically bounded environments that encompass physical environments and social interactions, which together shape everyday life experiences (Sampson et al., 1997). As critical environments for children's development, neighborhood exhibit multidimensional characteristics that have a significant impact on individual development. Studies have focused on structural characteristics (e.g., poverty, racial heterogeneity) that are shaped over time by objective factors such as institutions and history (Odumegwu et al., 2025). This study further expands neighborhood characteristics into structural and nonstructural dimensions: structural characteristics refer to the "skeleton" shaped by objective forces over time such as economics, policies, and institutions (including poverty, racial heterogeneity, resource accessibility, and safety), while nonstructural characteristics refer to social processes or residents' spontaneous behaviors (including collective efficacy, social support networks) (Odumegwu et al., 2025). and social support networks (Sampson et al., 1997). Evidence suggests that neighborhood economic disadvantage and racial disparities are directly associated with behavioral problems (Aryee et al., 2022), low birth weight (Vandeleur et al., 2024), and somatic illnesses in children (Ellen, Mijanovich, and Dillman, 2001; Solmi et al., 2017), and that insufficient food and healthcare resources can further threaten children's health outcomes (Sui, Ettema, & Helbich, 2022); at the mental health level, unfavorable community environments significantly increase the risk of mental illness and depression (King, Huang, & Dewan, 2022; Newbury et al., 2018), and exposure to community violence exacerbates adolescent trauma accumulation (Molnar et al., 2016).

Evidence suggests that both neighborhood characteristics and ACEs are strongly associated with individual health, and scholars have begun to progressively focus on the association between the two by viewing neighborhood characteristics as one of the causes of ACEs. This study categorizes neighborhood characteristics into structural and non-structural characteristics; structural characteristics have been the dominant direction of research because census data are widely available and the data are easily accessible (Freisthler, B., & Maguire-Jack, K., 2015). Studies have confirmed that poverty and racial heterogeneity affect the incidence of child maltreatment (Barboza-Salerno, 2020; Maguire-Jack et al., 2022), exposure to neighborhood violence exacerbates the intergenerational transmission of ACEs (Valentino et al., 2012), and chaotic and disorganized (with low collective efficacy and cohesion) neighborhoods increases the risk of parental child abuse (Pei et al., 2019). Although research has identified the effects of structural and nonstructural characteristics of neighborhoods on ACEs, current research has failed to establish a systematic theoretical framework that encompasses multidimensional neighborhood characteristics, reviews and integrates existing evidence to analyze the multiple pathways of neighborhood characteristics on ACEs, and the discussion of the dimensions of the interactions is incomplete. Given the profound impact of neighborhood characteristics and ACEs across the lifespan, systematically reviewing and analyzing the links between the two would benefit child development and protection. Therefore, this study aimed to achieve two objectives: (1) to systematically review and integrate the literature on the relationship between neighborhood characteristics and ACEs; and (2) to elucidate the potential pathways (direct, indirect, or mediated effects) through which neighborhood characteristics lead to ACEs and to explain whether there are linkages between neighborhood characteristics. This work not only provides evidence to explain the causes of ACEs, but also provides a basis for providing targeted prevention and protection measures based on neighborhoods.

2. Methods

We searched four databases (PubMed, Embase, Web of Science, and ProQuest). During the search, we used a combination of the following keywords: (“Adverse childhood experience” OR ACEs* OR abuse* OR Neglect* OR maltreatment* OR violence* OR “Adverse childhood event” OR Conflict OR sexual abuse* OR Trauma*) AND (Neighborhood* OR Community* OR “Neighborhood characteristic” OR Residential characteristic* OR “Structural characteristic” OR “Multivariate analysis” OR “Collective efficacy” OR “Resource accessibility” OR Poverty* OR Racial diversity* OR Safety* OR “Housing instability” OR Traffic conditions OR Assessment*) AND (Child* OR Adolescen* OR Youth* OR Small child* OR Young child*). Gray literature was also screened through Google Scholar and the first 10 pages of results were reviewed.

This systematic review protocol was registered with PROSPERO International Prospective Register of Systematic Reviews (protocol ID: CRD42017064781). The study process was guided by the Preferred Reporting Items for Systematic Evaluation (PRISMA) statement (Booth et al., 2012).

After the research team searched and removed duplicate records, two independent reviewers (Y.C. and X.L.) screened the abstracts and titles of all identified studies. The remaining literatures were subsequently evaluated for full texts against predetermined inclusion criteria, exclusion criteria, and quality assessment metrics. The third investigator (F.D.) only intervened when discrepancies arose between the two reviewers; if initial screening judgments aligned, F.D. did not participate in data processing. Risk of bias was assessed across four key domains: Population representativeness (including sampling frame adequacy, response bias, and attrition rate); Validity of measurement instruments (differentiating between ACEs measurement and neighborhood indicators assessment); Risk of over-adjustment (specifically addressing potential mediator variable misclassification).

3. Results

Our initial search of four databases (PubMed, Embase, Web of Science, ProQuest) yielded 448,563 records, which were narrowed down to 3,589 after a broad screening of titles and article types, and after removing 1,705 duplicates, 1,884 studies were independently researcher screened for titles/abstracts and tracked for inclusion in the citation section of the literature, resulting in 57 literatures. We then screened the full text of these literatures to assess the results. We identified 13 studies that did not include ACEs as a final outcome, 2 studies that focused on immigration factors, 2 studies that lacked an ACEs trajectory measure, and 1 study that prioritized parenting patterns. The final number of included studies was 39, and the quality assessment categorized 6 as high quality, 28 as moderate quality, and 5 as low quality. The search process is shown in Figure 1.

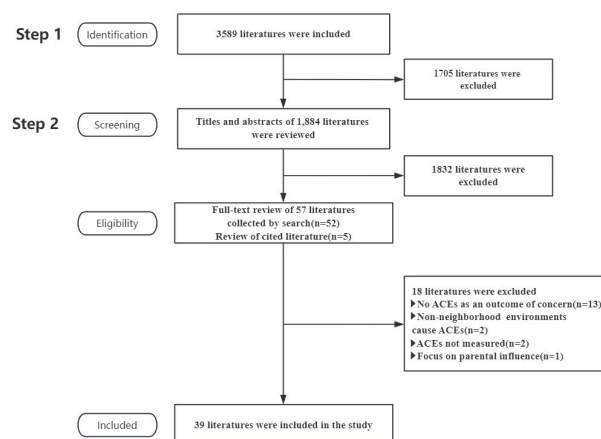


Figure 1. Search Process

The study systematically reviewed international literatures exploring the association between ACEs and neighborhood characteristics, covering research from the United States, United Kingdom, Canada, China, and Spain. Geographically, literatures distribution was highly concentrated: 35 studies (89.5%) originated from the United States, while the remaining 4 (10.5%) were distributed across the United

Kingdom (n=1), Canada (n=1), China (n=1), and Spain (n=1). Cumulatively, the included studies encompassed over 370,000 participants and 6,600 census tracts. Of the 39 studies included in the analysis, 31 explored the impact of neighborhood structural factors on ACEs, with 22 focusing on the association between neighborhood poverty and ACEs, 6 analyzing the role of racial diversity, and 10 examining the impact of collective efficacy. The remaining eight studies focused on non-structural factors, including five that assessed the impact of resource accessibility, and three that explored the association between neighborhood safety and ACEs. Notably, 18 studies used multivariate analysis to simultaneously analyze the combined impact of two or more neighborhood indicators.

Based on the systemic and historical correlations of the indicators, scholars have categorized as structural factors those factors that are profoundly influenced by long-term institutions, economic structures, and historical policies that cannot be resolved through short-term interventions. Key neighborhood structural factors include economic disadvantage, racial heterogeneity, and access to resources (housing, education, transportation), while collective efficacy is not usually categorized as a structural factor because it is a social process that is subjectively constructed by residents. (Sampson, Morenoff, & Gannon, 2002; Molnar et al., 2016; Ernst, 2001). The relevant studies included all identified neighborhood characteristics as important risk factors for ACEs and reported correlations between structural or nonstructural factors and ACEs. Of these studies, five were categorized as high quality.

The most frequently cited structural factors are neighborhood poverty, racial diversity, followed by resource accessibility and neighborhood safety, both of which are derivative outcomes of neighborhood poverty. Because of the broad range of structural factors, which have been measured differently in different studies, this review will prioritize the analysis of a few common indicators (neighborhood poverty, racial diversity, resource accessibility, and neighborhood safety), with characteristics outside of that range collectively referred to as “structural factors,” and housing insecurity and accessibility to transportation included in resource accessibility sex in the context of resource accessibility. Among the non-structural factors, only studies related to neighborhood collective efficacy (collective efficacy = social cohesion + informal social control) were sufficiently numerous and met the criteria for inclusion in this review. When describing the types of ACEs measured in the literature, the classic 10 ACEs (Felitti et al., 1998) are typically used, plus witnessing/ experiencing violence.

3.1 Structural Characteristics

3.1.1 Neighborhood Poverty

Neighborhood poverty is the most common structural factor. Existing research suggests that there is a significant association between neighborhood poverty and ACEs, and that economic disadvantage can also lead to a range of consequences, such as community safety and unequal distribution of resources (Maguire-Jack & Font, 2017).

Table 1 summarizes studies linking neighborhood poverty to ACEs. Three high-quality U.S.-based studies identified consistent linkages between both area-level economic status and poverty with ACEs.

Specifically, Barboza-Salerno (2020) employed child maltreatment incidence density ratios (IDRs) and Bayesian multilevel spatio-temporal modeling to analyze substantiated referrals in New Mexico. The analysis revealed positive correlations between child maltreatment incidence density and negative economic indicators, including rent burden and low-income areas, indicating that the local economy constitutes a critical risk factor for child maltreatment. Similarly, Graif and Matthews (2017) through a cross-city study encompassing Chicago, New York, and Boston, demonstrated that ACEs exhibit stronger associations with poverty in adjacent neighborhoods compared to residential neighborhoods, while physical proximity to extreme-poverty areas may mitigate child victimization risks. Additionally, a Florida-based study established significant associations between concentrated disadvantage, wealth disparity, and ACEs, with their combined economic structure accounting for 10.4% of the variance in ACEs scores (Baglivio et al., 2017).

Among moderate-quality studies, a consensus emerged regarding economic disadvantage as a significant predictor of ACEs. In summary, neighborhood poverty was positively correlated with ACEs incidence in all 22 studies.

Table 1. Neighborhood Poverty and ACEs (See Table for Supplementary Documents)

Authors	Country	Sample size	Study quality	Individual/Regional studies	Measurement dimension	Type of ACEs	Data source
Gracia et al. (2018)	Spain	552 census tract	1,5**,6 (medium)	Regional	Neighbourhood poverty	Physical abuse	Longitudinal cohort
Maguire-Jack et al. (2022)	USA	4898	2,3,5** (medium)	Individual	Neighbourhood poverty Neighbourhood safety	Physical abuse Emotional abuse	Longitudinal cohort
Fong et al. (2019)	USA	32737	3,5**,6 (medium)	Individual	Neighbourhood poverty	Physical abuse Emotional neglect	Longitudinal cohort
Barboza-Salerno (2020)	USA	499 census tracts	1,3,4,5**,6 (high)	Regional	Neighbourhood poverty Racial diversity	Physical abuse Emotional neglect	Longitudinal cohort
Graif et al.	USA	4446	1,2,3,4,5**,6	Individual	Neighbourhood	Witnessed/	Longitudinal

(2017)			(high)		poverty	experienced violence	cohort
Maguire-Jack & Sattler. (2023)	USA	3001	1,3,4,5** (medium)	Individual	Neighbourhood poverty	Physical abuse Emotional abuse Emotional neglect	Longitudinal cohort
Elizabeth et al. (2014)	USA	1172	3,4,5**,6 (medium)	Individual	Neighbourhood poverty	Sexual abuse	Longitudinal cohort
Maguire-Jack et al. (2021)	USA	89820	1,2,3,5** (medium)	Individual	Neighbourhood poverty	Physical abuse Emotional abuse Emotional neglect	Longitudinal cohort
Maguire-Jack et al. (2017)	USA	3023	3,5** (low)	Individual	Neighbourhood poverty	Physical abuse Emotional neglect	Cross-sectional survey
Maguire-Jack et al. (2017)	USA	946	2,3,5* (low)	Individual	Neighbourhood poverty	Physical abuse	Cross-sectional survey
McLeigh et al. (2018)	USA	483	2,3 (low)	Individual	Neighbourhood poverty Collective efficacy	Physical abuse Emotional neglect	Cross-sectional survey
Seon et al. (2021)	USA	4898	3,4,5** (medium)	Individual	Neighbourhood poverty Collective efficacy	Physical abuse Emotional abuse Emotional neglect	Longitudinal cohort
Merritt et al.	USA	196 census	2,3,5*,6	Regional	Neighbourhood	Physical	Cross-sectional

(2009)		tracts		(medium)		poverty	abuse Emotional neglect	survey
Baglivio et al. (2015)	USA	59342		1,3,4,5**,6 (high)	Individual	Neighbourhood poverty	10 ACEs	Longitudinal cohort
Freisthler et al. (2007)	USA	941		3,4,5**,6 (medium)	Regional	Neighbourhood poverty	Physical abuse Emotional abuse	Cross-sectional survey
Freisthler et al. (2004)	USA	940	census tracts	3,4,5**,6 (medium)	Regional	Neighbourhood poverty	Physical abuse Emotional abuse Emotional neglect	Cross-sectional survey
Zimmerman et al. al. (2011)	USA	8782		1,2,5** (medium)	Individual	Neighbourhood poverty	Witnessed/ experienced violence	Longitudinal cohort
Coulton et al. (2018)	USA	475	census tracts	3,4,5**,6 (medium)	Regional	Neighbourhood poverty	Physical abuse Emotional abuse	Longitudinal cohort
Coulton et al. (1999)	USA	20	census tracts	2,3,4,6 (medium)	Individual	Neighbourhood poverty Collective efficacy	"Physical abuse Emotional abuse"	Cross-sectional survey
Kravitz-Wirtz et al. al. (2022)	USA	2471		2,4,5**,6 (medium)	Individual	Neighbourhood poverty Racial diversity	Witnessed/ experienced violence	Longitudinal cohort
Farrell et al. (2017)	USA	11149		3,4,5**,6 (medium)	Individual	Neighbourhood poverty	Physical abuse	Cross-sectional survey
Swanson et al. (2001)	USA	159	census tracts	1,3,5*,6 (medium)	Regional	Neighbourhood poverty	Physical abuse	Longitudinal cohort

Table 2. Racial Diversity and ACEs (See Table for Supplementary Documents)

Authors	Country	Sample size	Study quality	Individual/ Regional studies	Measurement dimension	Type of ACEs	Data source
Barboza-Salerno (2020)	USA	499 census tracts	1,3,4,5**,6 (high)	Regional	Racial diversity Neighbourhood poverty	Physical abuse Emotional neglect	Longitudinal cohort
Wolff et al. (2018)	USA	92017	2,4,5**,6 (medium)	Individual	Racial diversity	Emotional abuse Substance Abuse	Longitudinal cohort
Kravitz-Wirtz & Bruns. (2022)	USA	2471	2,4,5**,6 (medium)	Individual	Racial diversity Neighbourhood poverty	Witnessed/ experienced violence	Longitudinal cohort
Coulton et al. (2018)	USA	475 census tracts	3,4,5**,6 (medium)	Regional	Neighbourhood poverty Racial diversity	Physical abuse Emotional abuse	Longitudinal cohort
Littleton et al. (2024)	USA	1137 census tracts	1,3,5**,6 (medium)	Regional	Racial diversity	Physical Abuse Sexual Abuse Emotional Abuse Physical / Emotional Neglect	Cross-sectional survey

When a study is included in a table for a particular variable, the measurement method column indicates the method used in the study to measure the main variables covered in the table.

3.1.3 Neighbourhood Safety

In this study, neighborhood safety is not a single criminal incident or short-term intervenable situation, It's influenced by historical policies (e.g., redlining policies; Estien et al., 2024) as well as other structural factors (neighborhood poverty, racial segregation) over time and broadly, and is therefore equally considered one of the structural factors. Existing research suggests that children witnessing or

experiencing violence should also be considered ACEs, and poor community safety may be a vector for these ACEs (Khazanchi et al., 2024; Son et al., 2022). Specifically, living in violence-prone neighborhoods not only increases children's risk of exposure to violence, but also increases the stress in parents' lives, leading to greater supervision and discipline and indirectly increasing the probability of child maltreatment (Chen & Lee, 2017).

Four studies specifically explored neighborhood safety (Table 3). Two of these studies used the same longitudinal birth cohort data (FFCWS): the first study confirmed through longitudinal path analysis that exposure to community violence was positively associated with the risk of maltreatment at all three childhood ages (3, 5, and 9 years). Moreover, exposure to community violence may also indirectly increase maltreatment risk through maternal depression and substance use (Maguire-Jack et al. et al. 2022). The second study, based on longitudinal data from 47 Latino immigrant mother-child dyads, revealed the pathways through which exposure to community violence influenced mothers' harsh discipline: mothers' witnessing of community violence was significantly and positively associated with psychological aggression, physical aggression, and frequency of corporal punishment and the effects were independent of factors such as domestic violence, depression, and substance use, with direct experience of community violence only marginally significantly associated with psychological aggression, and no significant direct effects on physical aggression and corporal punishment (Chen, & Lee, 2017). Intergenerational studies have also found that higher exposure to violence in the mother's neighborhood is associated with a significant increase in the risk of intergenerational transmission. Violent environments exacerbate mothers' stress, weakening their emotional regulation and leading to harsher parenting behaviors (Valentino et al., 2012). The last study did not measure parents separately, but also pointed out that parents living in chaotic communities experience more stress, which ultimately exacerbates the risk of abuse (Fei Pei, 2019).

Table 3. Neighbourhood Safety and ACEs (See Table for Supplementary Documents)

Authors	Country	Sample size	Study quality	Individual/Regional studies	Measurement dimension	Type of ACEs	Data source
Chen, & Lee (2017)	USA	2840	1,2,3,5** (medium)	Individual	Neighbourhood safety	Physical abuse Emotional abuse	Longitudinal cohort
Maguire-Jack et al. (2022)	USA	4898	2,3,5** (medium)	Individual	Neighbourhood poverty Neighbourhood safety	Physical abuse Emotional abuse	Longitudinal cohort

Valentino et al. (2012)	USA	140	2,3,4(low)	Individual	Neighbourhood safety	Physical abuse Emotional abuse Sexual abuse	Longitudinal cohort
Pei et al. (2019)	USA	3036	1,2,3,5** (medium)	Individual	Neighbourhood safety	Physical abuse	Longitudinal cohort

3.1.4 Resource Accessibility

Inequality in resource distribution does not develop overnight, but is influenced over time by structural factors such as poverty and race, and therefore exhibits significant structural characteristics (An, Yu, & Zhu, 2020; Elenbaas, & Killen, 2017). It contributes to inequalities in children's well-being, such as marginalized neighborhoods being disadvantaged in the distribution of resources such as transportation, health care, and education, and exacerbates exposure to ACEs through resource disconnection (Fong, 2019). This review distinguishes between neighborhood poverty and resource accessibility because, although they are spatially coupled, nonprofit interventions, government subsidies, and residents' self-initiated activities may result in communities receiving more resources than expected.

Table 4 summarizes relevant studies of resource accessibility that have systematically examined the ways in which resources influence ACEs. Studies in Scotland measuring housing, transportation, childcare, breastfeeding counseling, and park proximity found that transportation resources reduced the incidence of ≥ 3 ACEs by 8 percentage points among low-income households and reduced the incidence of ACEs due to income-based inequality by 21%. Among higher-income households, housing and breastfeeding counseling were also associated with fewer ACEs (10% and 9%, respectively) (Blair et al., 2019). Georgeades et al. (2023) conducted a case-control study using the Area Deprivation Index (ADI) and Children's Opportunity Index (COI), reporting that the median age of assault-injured children admitted to trauma centers was 14 years, with 62.7% residing in moderate/high ADI areas. Similarly, 64.6% of these children lived in low/very low COI areas. However, this conclusion risks selection bias due to sampling limited to Level I trauma centers. Another team applied geographically weighted regression (GWR) to analyze spatial heterogeneity, identifying clusters with ≥ 4 ACEs that exhibited socioeconomic resource scarcity, poor food access, negative health perceptions, higher drug overdose mortality, elevated crime rates, and limited green spaces. These patterns suggest a traumatic retention effect—resource deprivation restricts residents' mobility, perpetuating an “adversity trap” (Skiendzielewski et al., 2024). Lastly, a cross-sectional spatial regression analysis of administrative data from 2,052 census tracts in a major U.S. city focused on childcare needs revealed negative

associations between informal child supervision resources and maltreatment referrals, with lower maltreatment rates in affluent and immigrant-dense neighborhoods (Klein, 2011).

Table 4. Resource Accessibility and ACEs (See Table for Supplementary Documents)

Authors	Country	Sample size	Study quality	Individual/Regional studies	Measurement dimension	Type of ACEs	Data source
Camacho et al. (2022)	USA	81	2,4 (low)	Individual	Resource accessibility	Emotional neglect Sexual abuse Substance Abuse	Cross-sectional survey
Blair, Marryat, & Frank (2019)	UK	3456	1,2,3,4,5** (high)	Individual	Resource accessibility Neighborhood poverty	Physical abuse Emotional neglect Substance Abuse	Cross-sectional survey
Skiendzielewski et al. (2024)	USA	1679	3,4,5**,6 (medium)	Individual	Resource accessibility Neighborhood poverty	Physical abuse Emotional abuse Sexual abuse Physical/Emotional neglect	Cross-sectional survey
Georgeades et al. (2023)	USA	1224	3,4,5**,6 (medium)	Individual	Resource accessibility	Witnessed/experienced violence	Cross-sectional survey
Klein (2011)	USA	2052 census tracts	1,3,5**,6 (medium)	Regional	Resource accessibility Neighborhood poverty	Physical abuse Emotional abuse	Cross-sectional survey

3.2 Non-structural Characteristics

3.2.1 Collective Efficacy

Collective efficacy is an extension of Bandura's (1977) self-efficacy theory, is a group's shared belief in their capabilities to succeed at given tasks (Sampson, 2003). Classic research divides the measurement of collective efficacy into a combination of mutual trust (cohesion) among community residents and the willingness to participate in informal interventions (social control) to promote the common good of the community (Sampson et al., 1997). While community collective efficacy is influenced by structural factors, it is not itself a structure, as it depends on trust, interaction, and shared cognition among residents, and is fundamentally the result of residents' subjective perceptions.

Table 5 summarizes key studies on collective efficacy. Due to the difficulty of collecting collective efficacy data at the community level, all relevant studies used self-reported data to measure collective efficacy. Most studies (8/9) improved upon two scales developed by Sampson et al. (1997) in a human development project in Chicago communities to measure social control and community cohesion. Four of these studies measured both social control and cohesion, while the remaining four studies measured either social control or cohesion separately. High-quality cross-sectional analyses show that as collective efficacy declines, the incidence of abuse (especially neglect) surges from 8.2 cases per 1,000 children to 37.3 cases (Molnar et al., 2016). A Chinese cross-sectional study found a significant negative correlation between community social cohesion and mild parental physical violence, but no such association was observed with severe physical violence (Wang et al., 2019). Maguire-Jack and Showalter (2016) identified social cohesion as a partial mediating variable between community poverty and abuse, but this mediating effect was absent in cases of neglect. In contrast, McLeigh et al. (2018) found no significant mediating effect of social cohesion between community poverty and abuse through standardized abuse assessments, attributing the discrepancy in research findings to bias introduced by parents' self-reported parenting strategies. Follow-up research by Maguire-Jack and Marçal (2022) confirmed the mediating role of cohesion in the abuse pathway, but the data still relied on parents' self-reported parenting strategies, necessitating further validation. These findings were further confirmed by Seon's study, which showed that cohesion and social control mediated the relationship between structural characteristics and child abuse and neglect (Seon, 2021).

Table 5. Collective efficacy and ACEs (See table for supplementary documents)

Authors	Country	Sample size	Study quality	Individual/ Regional studies	Measurement dimension	Type of ACEs	Data source
Wang, Chen, & Lyu (2019)	China	1337	2,3,4,5** (medium)	Individual	Collective efficacy	Physical abuse	Cross-sectional survey
Freisthler &	USA	3023	2,3,4,5**	Individual	Collective efficacy	Physical abuse	Cross-sectional

Maguire-Jack (2015)			(medium)				survey
McLeigh, McDonnell, & Lavenda (2018)	USA	483	2,3 (low)	Individual	Neighbourhood poverty	Physical abuse Emotional neglect	Cross-sectional survey
Seon (2021)	USA	4898	3,4,5** (medium)	Individual	Neighbourhood poverty	Physical abuse Emotional abuse Emotional neglect	Longitudinal cohort
Molnar et al. (2016)	USA	847 census tracts	2,3,4,5**,6 (high)	Regional	Collective efficacy	Physical abuse Sexual abuse	Cross-sectional survey
Maguire-Jack et al. (2022)	USA	3123	2,3,5** (medium)	Individual	Collective efficacy	Physical abuse Emotional abuse	Longitudinal cohort
Kohen et al. (2008)	Canada	3528	1,2,3,5** (medium)	Individual	Collective efficacy	Physical abuse Emotional abuse	Longitudinal cohort
Coulton et al. (1999)	USA	20 census tracts	2,3,4,6 (medium)	Individual	Neighbourhood poverty	Physical abuse Emotional abuse	Cross-sectional survey
Spilsbur et al. (2022)	USA	400	2,3,4,6 (medium)	Individual	Collective efficacy	Physical abuse	Longitudinal cohort

4. Discussion

Neighborhoods serve as a critical context for children's development, with profound ties to their well-being. This study systematically reviewed 39 articles exploring how structural and non-structural characteristics of neighborhood influence ACEs. It found that these characteristics are associated with ACEs and do not act independently, but rather interact with each other to jointly shape ACEs.

When it comes to structural characteristics, the most commonly mentioned one is poverty. A systematic review of 22 studies related to neighborhood poverty shows that poverty primarily influences ACEs through two main pathways: 1. By undermining parents' ability to meet children's basic needs, thereby triggering stress, depression, and anxiety, which in turn disrupt parenting behaviors (Maguire-Jack & Sattler, 2023); 2. By weakening community cohesion, reducing social support, increasing crime rates,

and limiting access to educational, transportation, and healthcare resources, these factors collectively exacerbate the risk of ACEs (Gracia et al., 2018; Maguire-Jack et al., 2022). These two pathways encompass the vast majority of high- and medium-level studies, regardless of data type (longitudinal cohort studies or cross-sectional surveys), abuse reporting sources (self-reporting, parental reporting, or official/social organization administrative records), or study locations (Florida, California, Illinois, Valencia, and national samples). All results are statistically significant.

There are differences in how racial diversity is measured, but three key findings emerge: 1. Racial/ethnic minorities in high-vulnerability communities (low racial diversity communities) faced elevated violence exposure risks; 2. Slight changes in diversity minimally impacted child maltreatment rates, with significant correlations emerging only under extreme segregation; 3. Immigrant neighborhoods (characterized by high racial/ethnic heterogeneity) may buffer child maltreatment risks. Interdisciplinary analysis further identifies dual protection mechanisms for Immigrant neighborhoods: Enhanced familialist values and intergenerational support networks in immigrant communities reduced harsh discipline and neglect incidence (Kenny et al., 2021); First-generation immigrant parents preferentially employed culturally adapted protective strategies to mitigate adolescent exposure to community violence (Pottie et al., 2015).

There are limited studies on safety, but one study reported the role of parental stress in neighborhood safety issues, while the results of the other three studies all indicated that mothers play a more critical role in the relationship between neighborhood safety and ACEs. Several scholars have offered possible explanations for this phenomenon: first, as more stable caregivers, mothers bear greater responsibility for early education and child protection (Maguire-Jack et al., 2022); second, fathers' involvement and mobility make data collection difficult and hard to quantify, leading researchers to avoid treating fathers' roles as core factors (Valentino et al., 2012). Researchers acknowledge that they may have overlooked the potential role of fathers. Future studies could refine the research framework by adopting a multi-perspective approach (mothers, fathers, and children), but focusing on mothers remains the most pragmatic option at present.

Existing evidence provides preliminary insights into the association between resource accessibility and ACEs, suggesting that resource accessibility may play a protective role for children experiencing poverty-related adversity. However, these studies have limitations, including overreliance on cross-sectional designs (4/5 studies) and sampling bias. More importantly, current measurement methods overlook certain novel dimensions of resources, such as a range of neighborhood resources centered around networks, which are equally beneficial to child development (Sinko et al., 2024; Chaffin et al., 2024). Therefore, traditional resource indicators need to be expanded.

For non-structural characteristics, reviewed studies consistently indicate that collective efficacy, as a non-structural characteristic, mediates the relationship between structural characteristics and ACEs, and increases the likelihood of punitive parenting (Freisthler & Maguire-Jack, 2015), elevates parental health risks (Kohen et al., 2008), and heightens children's exposure to physical/psychological abuse

(Seon, 2021). Communities with higher collective efficacy exhibit protective socialization patterns, where frequent interactions among residents help intervene in child abuse (Freisthler & Maguire-Jack, 2015). However, such protective effects only emerge when collective efficacy exceeds a critical threshold (Spilsbury et al., 2022).

Furthermore, these studies have methodological flaws, and potential issues may affect the validity of the research. For example, longitudinal studies ($n=22$) face several limitations: due to insufficient representation of small towns and rural areas in the sample, the generalizability is limited (Maguire-Jack & Sattler, 2023; Kravitz-Wirtz et al., 2022), reduced temporal validity due to the use of data spanning a decade (Seon, 2021), and selection bias toward low socioeconomic status populations (Maguire-Jack & Marçal, 2022; Kravitz-Wirtz et al., 2022). Cross-sectional studies ($n=17$) also have limitations, including the difficulty in determining the sequence of events due to the cross-sectional nature of community exposure and ACEs data, which makes causal inference unclear (Freisthler & Maguire-Jack, 2015; Kholmatova, 2016; Wolff et al., 2018), sampling bias and information bias in cross-sectional data (Georgeades et al., 2023; Maguire-Jack & Font, 2017), and the neglect of dynamic ACEs trajectories in cross-sectional studies (Wolff et al., 2018). Although longitudinal studies require higher time and economic investments, they offer significant advantages in establishing causal relationships and tracking dynamic processes. Future research should prioritize longitudinal designs while focusing on enhancing the spatio-temporal representativeness of samples and establishing mechanisms for regular data updates to improve timeliness.

In addition, the method of data reporting is critical to the validity of the study. After conducting a quality assessment of the 39 included studies, significant differences in reporting scores were found, primarily attributed to variations in data sources: studies using child self-reports, official records, or community reports received a score of 1, while those relying solely on parent reports were excluded from scoring due to data limitations. Parent self-reports may be influenced by memory bias and social expectations, potentially leading to memory contamination or false accusations (Principe & London, 2022). While official records are objective, relying solely on confirmed cases (e.g., Georgeades et al., 2023, trauma center sample) may introduce selection bias; the validity of community reports depends on collective efficacy levels, which must reach a threshold to trigger intervention measures (Spilsbury et al., 2022). In studying collective efficacy, we found that different ACEs measurement tools may have an impact on the results. Two representative studies, both based on social disorganization theory, exemplify this complexity: McLeigh et al. (2018) and Maguire-Jack and Showalter (2016) operationalized neighborhood cohesion (collective efficacy = cohesion + informal social control) as the core mediating variable. Despite employing similar mediation frameworks, divergent measurement strategies led to conflicting results. McLeigh et al. (2018), using official child maltreatment reports, found cohesion mediated only the poverty-maltreatment relationship. In contrast, Maguire-Jack and Showalter (2016), utilizing the Parent-Child Conflict Scale (CTSPC), identified mediation effects solely between poverty and neglect. These contradictions underscore methodological factors

moderating outcomes: objective administrative records and subjective reporting systems likely capture distinct dimensions of maltreatment. It is worth noting that, given the limitations of all methods, children's self-reports provide subjective information, while official records and community reports serve as key objective validations, offering advantages over parental self-reports. Based on these findings, future research is recommended to adopt a data triangulation validation approach, systematically integrating evidence from multiple sources to enhance methodological rigor.

After reviewing the included studies, we found that there is currently no uniform standard for measuring ACEs. Current research on ACEs exhibits substantial methodological heterogeneity in measurement tools, rooted in the historical evolution of assessment frameworks. The foundational Felitti et al. (1998) study established a binary assessment system with 7 indicators (4 abuse categories vs. 3 family dysfunction categories). Subsequent expansions incorporated dimensions like physical/emotional neglect and parental separation, culminating in the standardized 10-item framework endorsed by the Centers for Disease Control and Prevention in 2019 (National Center for Injury Prevention and Control, 2019). Notably, empirical studies from 2013-2023 demonstrate parallel usage of three distinct frameworks: the original 7-item scale (Kravitz-Wirtz et al., 2022), a 9-item adaptation (Sampson, 2003), and the CDC-endorsed 10-item criteria (Maguire-Jack & Showalter, 2016). Although ACEs have been found to be positively associated with health outcomes in various studies, differences in the configuration of indicator dimensions (especially when indicators related to parental mental illness are involved) make cross-study comparisons difficult to achieve methodologically. This fragmentation in measurement may lead to bias in the identification of vulnerable populations and cause systematic errors in risk stratification models.

4.1 Limitations

First, in terms of the time frame, the literature review is limited to studies conducted after 1999, which aligns with the pioneering research by Felitti et al. (1998) and subsequent mainstream developments. While this approach is appropriate for studies based on ACEs, it may overlook some earlier literature on abuse.

In terms of geographical distribution, 34 out of 39 included studies (87.2%) were from the United States, with only 4 involving samples from China, Europe, and Australia. This geographical bias raises questions about the cross-cultural validity of the findings and increases the difficulty of elucidating the developmental mechanisms of ACEs in different cultural and socioeconomic contexts. Even for studies conducted within the United States, there are significant geographical, cultural, and socioeconomic differences between states, which may influence researchers' judgments about child development. For example, the large-scale migration from rural areas to cities in China has led to community instability, left-behind children, and marginalized migrant populations, all of which are strong risk factors for ACEs. Additionally, language screening criteria may have led to gaps in the literature. While the strategy of including only English-language literature enhanced the feasibility of the study, it may have overlooked the differentiated theoretical perspectives offered by non-English literature.

Finally, regarding the definition of neighborhood characteristics, this study primarily focuses on several of the most common structural and non-structural characteristics. While this strategy is targeted, the potential risk lies in the possibility of overlooking the impact of other characteristics on children, thereby limiting the comprehensiveness of the framework. Future research should gradually address these limitations.

4.2 Implications for Future Research

This review synthesizes multidisciplinary evidence, demonstrating that neighborhood characteristics (whether structural or non-structural) interact through complex pathways to shape ACEs.

Two studies on collective efficacy, despite reaching different conclusions due to differences in ACEs measurement methods, both confirmed the interaction between structural or non-structural characteristics and ACEs. Subsequent studies further refined this mediating pathway: Marçal et al. (2022) identified housing instability as a secondary mediating variable, confirming the negative correlation between declining community cohesion and abuse risk, thereby establishing the transmission pathway: “poverty $\uparrow \rightarrow$ cohesion $\downarrow \rightarrow$ housing instability $\uparrow \rightarrow$ abuse risk $\uparrow$.” The results of other studies included in this review collectively indicate that structural and non-structural factors do not act independently. These findings collectively outline the “structural or non-structural risk transmission—child outcomes” framework and clarify the mediating effects between the two. Future research should not only focus on structural and non-structural characteristics as causes of ACEs but also examine the interactive relationships between structural or non-structural characteristics as mediating variables and moderating variables (such as family socioeconomic status thresholds) and ACEs, constructing a multidimensional causal model.

Crucially, research spanning geography (Barboza-Salerno, 2020), public health (Molnar et al.; Kathryn Maguire-Jack et al., 2022), and criminology (Graif & Matthews, 2017; Kravitz-Wirtz et al., 2022) collectively emphasizes the necessity of interdisciplinary integration to transcend single-discipline perspectives. This integration not only enhances theoretical rigor but also provides a basis for actionable interventions, such as community empowerment models like the U.S. “Strong Communities Program”. This program has demonstrated effectiveness in mitigating ACEs through cross-sectoral collaboration and strengthened social networks (McDonell et al., 2015), indicating that isolated interventions are insufficient to address the intertwined challenges of poverty, resource inequality, and safety risks. Based on the findings of this review and the cross-sectoral collaboration intervention model, we propose the following recommendations: (a) Enhance neighborhood belonging and responsibility through participatory design to boost residents’ collective efficacy. (b) Utilize tools such as geographic information systems to dynamically monitor resource allocation, precisely identify areas at risk of resource inequality, and integrate social work resources to provide parents with physical and mental support (e.g., health screenings + counseling + experience-sharing groups), focus on parents’ physical and mental health. These methods aim not only to create child-friendly neighborhood but also to build parent-friendly neighborhood. (c) Develop standardized ACEs assessment tools and conduct

multinational longitudinal cohort studies to overcome the limitations of cross-sectional studies and enhance causal inference capabilities. (d) When applying the “Strong community” cross-sectoral collaboration model in practice, cross-sectoral working groups (education, healthcare, urban planning) should incorporate the Child Safety Index into government performance evaluation systems.

5. Conclusion

This systematic review systematically synthesized evidence from 39 empirical studies to construct a theoretical framework that incorporates multidimensional neighborhood characteristics. This framework clarifies the association between neighborhood characteristics and adverse childhood experiences (ACEs), providing key insights for future intervention strategies and policy development. The review categorizes neighborhood characteristics into two dimensions: structural and non-structural characteristics. Among structural characteristics, neighborhood poverty is identified as a core risk determinant, directly or indirectly increasing ACEs risk through pathways such as exacerbating parental stress and influencing other structural factors (neighborhood safety and resource accessibility). This review also found a mediating effect of racial diversity: moderate diversity can buffer ACEs risk, while extreme racial segregation amplifies it. In addition, access to resources has a protective effect on poverty-related ACEs, while neighborhood safety has a profound impact on the physical and mental health of parents (especially mothers). Among non-structural factors, collective efficacy serves as an important mediating variable between structural characteristics and ACEs, and when collective efficacy reaches a certain threshold, it has a protective effect on children. Overall, these findings underscore how multidimensional neighborhood characteristics influence and shape child development.

To promote development in this field, future research should focus on developing standardized ACEs measurement tools, prioritizing the use of longitudinal cohort data from self-reports or third-party reports to capture ACEs. During the review process, we found that ACEs may vary across different national contexts. Expanding the scope of cross-cultural comparisons is crucial for comprehensively understanding ACEs in different countries, and also helps to propose more valuable child protection policies and measures.

In summary, the relationship between neighborhood and child well-being requires interdisciplinary and multi-sectoral cooperation. At the same time, it is difficult to thoroughly solve child protection issues without considering neighborhood.

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