

# KNOWLEDGE SYNTHESIS IMPACTS OF ADVERSE CHILDHOOD EXPERIENCES (ACES) ON ADULthood

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## INTRODUCTION

### THE COMMISSION

The objective of this research is to broaden the understanding of Adverse Childhood Experiences (ACEs) by synthesising literature that goes beyond the traditional framework of individual trauma to include a wider range of structural and environmental stressors. ACEs are defined as potentially traumatic events that occur during childhood — such as abuse, neglect, and household dysfunction — which can disrupt healthy development and lead to long-term negative outcomes in mental, physical, and social well-being.

In this study, ACEs are further expanded to include systemic and collective traumas shaped by structural racism, socioeconomic inequality, colonization, religion, and psychological factors that impact both mental and physical health. This expanded framework also considers individual experiences of war and genocide as significant contributors to adversity. By integrating these intersecting dimensions, the research emphasises how broader social and historical forces compound the effects of ACEs — particularly for marginalised communities — and underscores the need for prevention and resilience-building strategies that address both individual and structural sources of trauma.

In British Columbia (BC), the prevalence of ACEs is notably higher than in other Canadian provinces. Indigenous communities in particular face disproportionately high rates of ACEs due to historical and ongoing colonial violence, systemic inequalities, and intergenerational trauma.

## WHAT IS KNOWLEDGE SYNTHESIS?

In collaboration with the **Network to Eliminate Violence in Relationships (NEVR)**, a non-profit organisation committed to addressing and preventing relationship violence through advocacy, education, and evidence-based policy. As part of NEVR's ongoing efforts to deepen its understanding of the root causes and impact of interpersonal violence, this project was initiated to explore the broad and evolving landscape of Adverse Childhood Experiences (ACEs).

A knowledge synthesis (KS) is a systematic and rigorous process of collecting, evaluating, and integrating findings from existing research to produce a comprehensive understanding of a given topic. It aims to identify patterns, gaps, and implications across studies to inform policy, practice, and future research (Grimshaw, 2010).

A research team of five postgraduate students from Simon Fraser University (SFU) conducted a knowledge synthesis to support further research and intervention strategies related to Adverse Childhood Experiences (ACEs). The team found peer-reviewed journal articles, primarily within the Canadian context, while also including relevant sources from the United States, the United Kingdom, Australia and other countries. Unless mentioned otherwise, the research or studies included are based in Canada.

## METHODOLOGY

This knowledge synthesis aims to provide a foundation for NEVR and other community-based organisations to inform future research, policy development, and intervention programming that addresses the broad and complex nature of Adverse

Childhood Experiences (ACEs). The results of the synthesis are presented in the later pages according to the relevant categories identified by this multidisciplinary team of researchers, whose backgrounds vary across communication, nursing, psychology and counselling, gender studies, political science, and social activism.

The team first met to brainstorm factors related to ACEs and decided to focus their search on the most recent studies, specifically from January 2015 to January 2025. The proposed factors were sorted into categories in an initial search. Various database platforms were used in accordance with the disciplines of the proposed categories. In the first attempt, the number of articles yielded was either overwhelming and unproductive or of little relevance. After the second meeting, the team finalised a list of nine main categories, with further subcategories, which is organised and summarised in Table 1 below. In subsequent searches, only peer-reviewed academic articles from the last decade were included in this synthesis.

Using Zotero, the articles were organised, managed, and then presented in the following sections. Each section represents one category and its subcategories, with a bibliography of the included or selected articles provided under the reference list of each subcategory. Given the uniqueness of each category, the search process and selection of relevant articles were further discussed in each section.

This knowledge synthesis highlights the complexity and evolving nature of ACEs through an expanded framework that includes structural and collective traumas such as poverty, structural racism, gender and ethnic disparities, health care inequities,



psychological factors, religion, socioeconomic adversity, and abuse. It also considers key areas of prevention, intervention, and policy.

These broader systemic stressors intensify the effects of individual ACEs, posing significant challenges, especially for marginalised communities. For instance, in British Columbia, ACEs are notably more prevalent, with Indigenous populations disproportionately (Toombs et al., 2022) affected due to intergenerational trauma and ongoing systemic injustices.

Overall, this synthesis serves as a foundation for future research and action, offering a comprehensive lens to understand and address the root causes and long-term impacts of ACEs.

**TABLE 1: THEMATIC CATEGORIES AND SUBCATEGORIES OF ACES LITERATURE**

Thematic Category	Subcategories
Epigenetics	<ul style="list-style-type: none"> <li>• Early Life</li> <li>• Childhood and Adolescence</li> <li>• Adulthood and Aging</li> <li>• Implications for Health</li> </ul>
Ethnicity and Gender	<ul style="list-style-type: none"> <li>• Health Disparities among First Nations Communities</li> <li>• Recidivism &amp; Justice System (FNs)</li> <li>• Gender-Based Victimization &amp; Sexual and Gender Minorities (SGM)</li> <li>• Immigrants &amp; Psychosocial Health</li> </ul>

Health and Health Care	<ul style="list-style-type: none"> <li>• Pregnancy and Maternal Health</li> <li>• ACEs Screening and Parenthood</li> <li>• Substance Use and Addiction</li> </ul>
Psychology	<ul style="list-style-type: none"> <li>• Corporal Punishment</li> <li>• Physical Discipline and Punishment</li> <li>• Parenting</li> <li>• Bullying</li> <li>• Individualism vs. Collectivism</li> <li>• Social Norm or Traditional Values</li> <li>• Prosocial Behaviour</li> </ul>
Prevention, Intervention & Policy	<ul style="list-style-type: none"> <li>• Technology-Assisted Intervention Models and Social Support</li> </ul>
Religion	<ul style="list-style-type: none"> <li>• Religiosity</li> <li>• Religion as a Coping Mechanism</li> </ul>
Socioeconomic Status (SES)	<ul style="list-style-type: none"> <li>• BIPOC, Immigrant Communities</li> <li>• Familial Support as a Protective Mechanism</li> </ul>
Schooling	<ul style="list-style-type: none"> <li>• School-Based Disciplinary Experiences</li> <li>• Learning and Behaviour</li> </ul>
Domestic violence as ACE	<ul style="list-style-type: none"> <li>• Health and Developmental Impacts</li> <li>• Addiction Risks and Substance Use</li> <li>• Resilience and Long-Term Consequences</li> </ul>



## CHAPTER 1 - WITNESSING DOMESTIC ABUSE ON FUTURE OUTCOMES

Adverse Childhood Experiences (ACEs) encompass various forms of trauma that significantly affect individuals' psychological, physiological, and behavioural development. Nine sources were investigated for this section out of the original search of 468 results. The peer-reviewed articles range from Witnessing abuse, whether physical, emotional, or psychological, contribute to the detrimental effects associated with ACEs, influencing future mental health, substance use, and overall well-being. This paper synthesises findings from multiple studies to explore the lasting impact of witnessing abuse during childhood.

### HEALTH OUTCOMES AND PSYCHOLOGICAL WELL-BEING

Bochicchio et al. (2024)) highlight how individuals with ACEs, including exposure to abuse, experience higher rates of mental health disorders, particularly among sexual minority women. The study underscores the link between ACEs and increased vulnerability to conditions such as depression and anxiety. Similarly, Liebman et al. (2020) examine the relationship between childhood abuse and posttraumatic stress disorder (PTSD), revealing a strong association between ACEs and eating disorders, further emphasising the negative psychological consequences.

### EPIGENETIC AND DEVELOPMENTAL EFFECTS

Lussier et al. (2023) explore the biological consequences of ACEs, demonstrating how childhood adversity alters epigenetic patterns, affecting stress regulation and mental health outcomes. The study provides evidence that the timing and nature of childhood

trauma, including witnessing abuse, influence long-term physiological changes that may predispose individuals to mental health disorders. We will go into more detail about epigenetics in the dedicated section.

## SUBSTANCE USE AND ADDICTION RISKS

Several studies examine the correlation between ACEs and substance use. Marchica et al. (2022) identify ACEs as significant predictors of addictive behaviours in adolescence, particularly among individuals exhibiting internalising and externalising symptoms. Fuller-Thomson E et al. (2020) further establish a link between different types of ACEs, including witnessing abuse, and increased susceptibility to alcohol and drug dependence in adulthood.

## RESILIENCE AND SOCIAL FACTORS

While ACEs are associated with numerous negative outcomes, certain protective factors may moderate their effects. Racine et al. (2018) discuss the role of social support in mitigating the risks associated with maternal ACEs, suggesting that strong social networks can buffer the adverse impact of childhood trauma. Similarly, Chai and Xue, (2023) explore the influence of religious engagement, finding mixed results on whether it serves as a protective or exacerbating factor for individuals exposed to childhood abuse.

## AGING AND LONG-TERM CONSEQUENCES

Tao et al. (2024) investigate the association between ACEs and frailty in older adults, demonstrating that early-life trauma, including witnessing abuse, has long-term

physical health implications. The study suggests that individuals with a history of ACEs are at greater risk of developing chronic conditions and functional limitations later in life.

## Conclusion

The reviewed studies collectively highlight the profound and multifaceted impact of witnessing abuse during childhood. ACEs contribute to adverse mental health outcomes, epigenetic modifications, increased substance use risk, and long-term physical frailty. However, social support and resilience factors can play a crucial role in mitigating these effects. Understanding these relationships is essential for developing interventions aimed at reducing the long-term consequences of childhood adversity.

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<https://doi.org/10.1016/j.jad.2018.05.056>

Tao, Y., Wang, H., Luo, J., Zhang, H., Zhang, W., Yu, M., Ji, S., Peng, S., & Zhang, X. (2024). The Association between Adverse Childhood Experiences and Frailty: A Systematic Review. *Journal of the American Medical Directors Association*, 25(7), 105042. <https://doi.org/10.1016/j.jamda.2024.105042>

## EPIGENETIC IMPACT ACROSS LIFESPAN

Adverse Childhood Experiences (ACEs) have been extensively linked to epigenetic modifications, influencing gene expression and physiological development throughout life. For the purpose of this section, we have used seven articles out of the original search of 99 search results. The accumulation of ACEs can lead to significant changes in DNA methylation, a key epigenetic mechanism affecting stress response, cognitive function, and chronic disease susceptibility (Kodila et al., 2023). Studies demonstrate that exposure to trauma during critical developmental periods leads to lasting biological changes that manifest across different stages of life.

### **Early Life Epigenetic Modifications**

The perinatal period is a crucial window for epigenetic programming, as stress and trauma during this time can result in persistent alterations in gene expression. Kodila et al. (2023) highlight that perinatal trauma influences epigenetic patterns linked to chronic

pain and stress regulation. Similarly, Moore et al. (2022) provide evidence that infant DNA methylation can serve as an early indicator of intergenerational trauma, suggesting that early-life adversity alters stress-response pathways.

### ***Childhood and Adolescence***

During childhood and adolescence, continued exposure to adversity can reinforce epigenetic changes that influence mental health and cognitive function. Research by Moore et al. (2022) suggests that paternal ACEs are associated with specific DNA methylation changes in offspring, further implicating intergenerational transmission of trauma. Additionally, studies indicate that adversity affects the prefrontal cortex and hypothalamus, key brain regions involved in stress regulation (Sgro et al., 2025).

### ***Adulthood and Aging***

In adulthood, ACE-related epigenetic modifications are linked to accelerated biological aging and increased susceptibility to mental health disorders. Joshi et al. (2023) report that individuals with higher ACE exposure exhibit epigenetic age acceleration, suggesting that trauma contributes to premature aging. Similarly, Felt et al. (2023) show that females exposed to early-life adversity display epigenetic modifications associated with cognitive decline in midlife.

### ***Implications for Health and Future Research***

The growing body of research underscores the importance of addressing ACEs early to mitigate their long-term epigenetic consequences. Studies such as those by Tang et al. (2020) demonstrate that early intervention may help regulate stress-response pathways and prevent adverse health outcomes. Future research should explore potential



epigenetic therapies and resilience-building interventions to counteract the long-term effects of ACEs.

By integrating findings across different life stages, it becomes evident that ACEs play a pivotal role in shaping epigenetic regulation and overall health, emphasising the need for targeted intervention and support strategies throughout life.

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## RELIGION

Adverse Childhood Experiences (ACEs) have been widely studied for their impact on mental health and well-being in adulthood. Religion, as a social and psychological construct, can serve both as a source of resilience and as a contributing factor to ACEs. Initially, we went in to find the work that depicts religion as an element of ACEs (Religious Trauma, etc). During my search, we found that there isn't much research done on the topic. In this section we have used five sources. Furthermore, we found a peer-reviewed article that suggests that religion can help in coping with ACEs. In this portion, we will explore this dual role of religion, drawing from various academic sources.

### ***Religiosity as an Adverse Childhood Experience***

Some studies suggest that religious environments can contribute to adverse childhood experiences, particularly in contexts where religious doctrines enforce punitive discipline, suppress individuality, or perpetuate abuse. Cleary et al. (2024) explore how childhood experiences, including rigid religious ideologies, can contribute to extremist behaviours in adulthood. Their study on Iraqi prisoners suggests that early exposure to coercive religious teachings, particularly when coupled with authoritarian parenting, can foster cognitive rigidity and susceptibility to radicalisation. This aligns with broader findings on how childhood trauma, including religious indoctrination that promotes fear or guilt, can shape maladaptive psychological outcomes.

Grady et al. (2023) discuss the potential for religion to serve as a mechanism of control in cases of childhood sexual abuse. Their study highlights how religious institutions sometimes fail to protect victims or even enable abuse by silencing survivors



through doctrines of obedience and forgiveness. When religious figures are perpetrators of abuse, the trauma can be compounded by a loss of faith and community support, leading to long-term psychological distress.

Chai and Xue (2022) examine the relationship between childhood abuse, substance use, and religion in Canada. Their findings indicate that in some cases, strict religious upbringings exacerbate trauma rather than mitigate it, particularly when victims are discouraged from seeking external psychological support. Children raised in highly restrictive religious environments may experience isolation, shame, and difficulty forming healthy attachments in adulthood.

### ***Religion as a Coping Mechanism for ACEs***

Conversely, religion and spirituality have been identified as protective factors that aid in resilience and recovery from ACEs. Grady et al. (2023) provide guidelines for spiritually informed care, emphasising that faith-based interventions can support survivors of childhood sexual abuse by offering a sense of hope, meaning, and community belonging. Religious practices such as prayer, meditation, and faith-based counselling have been associated with lower levels of post-traumatic stress and improved mental health outcomes.

Fuller-Thomson et al. (2016) explore factors contributing to flourishing after depression and note that religious engagement is a significant predictor of complete mental health among individuals with a history of childhood adversity. Their research suggests that spirituality can foster a sense of purpose and connection, buffering against the long-term effects of ACEs. Similarly, Fuller-Thomson and Ryckman (2020) highlight

that individuals with generalised anxiety disorder who engage in religious or spiritual practices report higher rates of recovery and overall well-being.

Chai and Xue (2022) also find that while religion can sometimes intensify the negative effects of childhood abuse, it can also serve as a crucial support system. Many individuals turn to religious communities for emotional support, and faith-based interventions have been effective in reducing substance use among those with traumatic childhood experiences.

### **Conclusion**

The relationship between ACEs and religion is complex, with evidence supporting both its potential as an adverse experience and its role as a source of resilience. While rigid or abusive religious environments may contribute to trauma, faith and spirituality can also serve as powerful tools for healing. The effectiveness of religious coping strategies largely depends on the nature of the religious experience and the availability of supportive faith communities.

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## CHAPTER 2 - PSYCHOLOGY AND TENTATIVE VIOLENCE IN LATER LIFE

This section focused on psychology studies on the connections between ACEs and tentative actions or social behaviours in the later life of those affected by ACEs, particularly in violence or impulsive intents. Some included suggestions on the prevention or reduction of the effect of ACEs. In all the topics below, the researcher selected seven related databases: APA PsycArticles; APA PsycBooks; APA PsycInfo; APA PsycTests; the Bibliography of Asian Studies; the Bibliography of Indigenous Peoples in North America (BIPNA); and Women's Studies International to look for the relevant articles. Keywords were selected based on the author's knowledge of the topic. Since the keywords yielded an amount of search results with many articles irrelevant to the topic of this Chapter, specific filtering procedures were adopted\*.

Majority of the research and studies included in this section were not conducted in Canada or the USA. We suggest that the result yielded might be because of the timeframe (2015 - 2025) that was adopted in this Knowledge Synthesis. For example, in search of the keyword 'physical discipline or punishment' when the time frame was removed with 'USA and Canada' added as an additional keyword, studies in 1996 or 2013 were found on the first five results.

While countries in Africa, South America and non-capital cities of European countries might either have rising concerns / awareness toward the effect of ACEs, or some of these studies were performed to follow-up or investigate changes and latest

trends in the community. \*Please refer to attachment for the methodology used for this part of knowledge synthesis.

## CORPORAL PUNISHMENT

Amongst the 19 results, 4 papers were related to this topic. A 2020 Zurich study (Neaverson et al., 2020) published a longitudinal examination that found self-control to be a protective factor against concurrent aggression. It has been argued that parents aid children in developing self-control by monitoring the child's behaviour, recognising undesirable behaviour and administering appropriate discipline when required. Self-control is therefore developed by the parents exercising social control. Study finds that self-control developed in teenagers (age 11-20) serves as a protective factor from aggressive behaviours a few years after. Besides, boys are usually less monitored than girls owing to gender differences, girls' level of self-control decreased consistently over time while boys fluctuated. Also, the increase in parental corporal punishment lowers boys' level of self-control which predicts higher levels of externalising behaviours. (Neaverson et al., 2020). Research in Spain by Jiménez-Granado et al., (2023) showed that authoritarian, negligent parenting styles and parents' psychological aggression is positively associated with Child-to-parent violence. Hellmann et al., (2018) shared the similar research finding in Germany. In Estonia, Peets et al., (2022) also found that a lack of parental warmth or overuse of behavioural control, corporal punishment was associated with increases in aggression.

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Neaverson, A., Murray, A. L., Ribeaud, D., & Eisner, M. (2020). A longitudinal examination of the role of self-control in the relation between corporal punishment exposure and adolescent aggression. *Journal of Youth and Adolescence*, 49(6), 1245–1259. <https://doi.org/10.1007/s10964-020-01215-z>

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## PHYSICAL DISCIPLINE OR PUNISHMENT

Three relevant studies were identified out of 14 results under this topic with one overlapping with the research by Jiménez-Granado et al., (2023) under the subtopic 'corporal punishment'.

A cross-sectional study conducted in Rio de Janeiro, Brazil (Bordin et al., 2022) involving 669 adolescents (ages 11-15) was performed. The study revealed that conduct problems of adolescents are linked to severe physical punishment in younger children, peer aggression in older adolescents, bullying victimisation among girls, and witnessing community violence among boys. The study recommended local interventions in health units, schools, and communities to reduce harsh physical punishment, address peer aggression, and provide increased school hours and extracurricular activities.

A baseline survey of 770 students (grades 7 - 8) from 11 secondary schools in Afghanistan (Corboz et al., 2018) was conducted to study children's peer Violence. The

numerical findings in this study were alarming. Amongst the surveyed, there was a high incidence of violence, with 49.7% of boys and 43.3% of girls reporting victimisation and 31.7% of boys and 17.6% of girls reported perpetration within one month before they were interviewed. There was a significant overlap between victimisation and perpetration, especially among boys. Whereas higher hunger/food insecurity correlates with experiences of violence. For boys, who perpetrated violence had higher absenteeism. In contrast, girls who were victimised showed greater absenteeism.

Both boys and girls who had perpetrated violence were significantly more likely to have witnessed abuse of their mother. While girls who had been victimised and who perpetrated were significantly more likely to have seen their father fight with another man.

Having experienced any corporal punishment at home or in school in the month before interview was significantly associated with both peer victimisation and perpetration. Boys who had been victimised and who had perpetrated violence were significantly more likely to have experienced corporal punishment at school. Interestingly, corporal punishment was only significantly associated with perpetration of peer violence for girls. One point unique to this study and worth noting, was the immediacy of an enactment of violence by (Afghanistan) teenagers after being victimised.

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## PARENTING

Four articles were found among 34 results in the search on this topic. A study conducted in Israel (Koren-Karie & Getzler-Yosef, 2019), based on Attachment Theory, examined how parents' attachment experiences affect their insightfulness regarding their children. Mothers with a history of sexual abuse were the focus of the study on attachment with their children. Insightfulness is defined as the ability of a parent to understand and interpret their child's emotional world, incorporating a range of motives and updating perceptions based on new information.

For the 60 mothers involved in this study, 30 had a history of sexual abuse (study group) and 30 did not. Age, family status, and occupations had no influence on the mothers' insightfulness or their trauma resolution. However, a higher education level was correlated with greater maternal insightfulness. The ability to maintain insightfulness despite past trauma underscores the importance of trauma resolution, which can lead to healthier parenting and child development.

Another study conducted in Spain (Cortina & Martín, 2021) focused on the emotional aspects of Adolescent-to-Parent Violence (APV). The study indicated that the

Emotional Reaction factor is linked to adolescents' deficits in emotional regulation and anger management, contributing to APV. APV was also associated with emotional insensitivity and a lack of empathy in adolescents. The research suggested that training practitioners to approach families without preconceived blame would facilitate assistance and help-seeking behaviours. Additionally, prevention strategies aimed at raising public awareness about APV and encouraging community involvement in detecting and addressing this issue would also be beneficial.

Similarly, a UK study (Bowen, 2017) analysed data from 7,743 children (51.6% boys) aged four regarding the relationship between Conduct Disorder Symptoms in preschool children and their parents' intimate partner violence (IPV). The results showed that children exposed to IPV are significantly more likely to exhibit conduct disorder symptoms compared to those not exposed. This association is notably stronger for girls than for boys, indicating potential gender differences in risk and resilience related to IPV exposure.

Additionally, in Burundi (Crombach & Bambonyé, 2015), researchers were interested in intergenerational violence. The study indicated that experiencing abuse in childhood negatively affects psychological well-being and increases the risk of abusive parenting and intimate partner violence. Researchers proposed that understanding the link between childhood maltreatment and parenting practices is crucial for addressing the repercussions of violence in African societies. Women who have experienced partner violence are more likely to use violence against their children and retaliate, while those who feel intimidated are less likely to resort to violence. Conversely, men are more likely

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## BULLYING

Bullying-victimisation during childhood is an adverse childhood experience. This subcategory summarises studies that take into account bullying as an ACEs. For this subsection, a peer-reviewed articles search was conducted from Humanities Abstracts (hma), Humanities Source, International Political Science Abstracts, MAS Ultra - School Edition, Social Sciences Abstracts (H.W. Wilson), Social Sciences Full Text (H.W. Wilson), Women's Studies International. This yielded six articles, out of which two were excluded due to irrelevance. The four selected studies present mixed results.

Dugal et al (2021) found a positive relationship between Cumulative Childhood Trauma (CCT), which includes bullying, and the likelihood of experiencing or perpetrating

psychological IPV. Their findings emphasise the need to address personality traits and affect regulation – cognitive and behavioural inability to control, tolerate; or refrain from externalising strong and negative emotions respectively – in CCT survivors. They suggest interventions to improve self-soothing and reduce negative urgency to prevent psychological IPV. Among the LGBTQ community, Hart et al.'s (2018) study shows that two forms of adverse childhood experiences, i.e. childhood abuse and anti-gay bullying victimisation early in life, are associated with adult psychological distress. It suggests that treatment to reduce negative and dysfunctional thinking has benefits for adult gay and bisexual men. Moreover, Geoffroy et al.'s (2023) longitudinal study in the UK found a correlation between suicide mortality and bullying victimisation. In the study cohort, children between the ages of 7 and 11 had been reported to experience bullying victimisation among whom 55 people (48 men) died by suicide between the ages of 18 and 52. Thus it concluded that bullying victims have a small increased risk of death by suicide.

However, Trompeter et al.'s (2023) study in the US confirms that ACEs and bullying victimisation are independently linked to a higher risk of mental health problems in adolescents but does not find any direct relationship between the two adverse experiences.

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## INDIVIDUALISM OR COLLECTIVISM

No research article, based on the searching method, was found to study the relationship between individualism or collectivism, ACEs and the outcome of ACEs in people's later life.

## SOCIAL NORMS OR TRADITIONAL VALUES

This is an interesting subcategory. When examining social norms and traditional values alongside ACEs and future attitudes or behaviour predictions, it becomes clear that all 30 articles point to the same conclusion: social norms and traditional values are related to and influential in violent behaviours. In communities where social and cultural norms are more misogynistic and oppressive to women, there tend to be a greater number of victims (of all genders) and potentially future perpetrators. Many papers found in this search discussed the prevention and reduction of ACEs at the social level, regardless of

the target group — teenagers, men, or women (e.g., Banyard et al., 2021; James-Hawkins et al., 2018; Butt et al., 2020).

Among the 30 results, some were selected for inclusion here either because they demonstrated a strong connection between ACEs and the potential for future adverse behaviour or attitudes, with social and cultural norms as connectors, or because they provided valuable insights on societal, legal, or community levels relevant to prevention and protection measures.

One quantitative study involving 5,448 young adolescents in Ethiopia (Murphy et al., 2021) examined the relationship between gender norms at different levels and rates of violence against women. It suggested that communities with more inequitable gender norms significantly influence experiences of household violence, more so than adolescent and household attitudes, particularly in rural areas. A notable aspect of this research was its innovative method for measuring inequitable gender attitudes and norms at individual, household, and community levels within the country.

The study revealed that both girls and boys in Ethiopia grow up in gender-inequitable societies where female caregivers often share these beliefs. It found that community norms are more influential than individual attitudes in cases of household violence. This led to recommendations emphasising the importance of programming and outreach efforts focused on shifting broader gender and adolescent-related norms as part of a comprehensive strategy to reduce violence against children. Such initiatives could include improved community-level reporting systems involving helping professionals and justice officials.



Speaking of social norms, Yoosefi Lebni et al. (2025) conducted research on the social determinants of violence against adolescent married women, systematically categorising factors into four categories, 18 subcategories, and 195 codes. For instance, the sociocultural factors included beliefs shaped by cultural norms, fatalism, inadequate social support, and legal weaknesses. Their conclusion was that violence against adolescent married women is influenced by a range of sociocultural, family, and individual factors, with silence and concealment being the most common reactions to their husbands' violence. These factors perpetuate the cycle of ACEs across generations.

Meanwhile, a study in Bangladesh (Yount et al., 2018) on men's perpetration of intimate partner violence (IPV) highlighted that the gender norms present in a man's community and his childhood exposure to violence are crucial, independent factors influencing his likelihood of perpetrating IPV, underscoring that this issue is not solely a concern for women. In fact, social norms appear to link ACEs to future actions, fostering silent acceptance and complicity regarding violence and abuse.

However, do ACEs necessarily lead to future repercussions? A very recent study conducted in Quebec, Canada, investigating dating violence victimisation disparities across sexual orientation (Petit et al., 2023) indicated that while sexual minority youth are more vulnerable to ACEs and their negative consequences, it remains unclear whether this vulnerability explains their higher risk for teen dating violence victimisation (TDVV). Rather, it may be an adoption of maladaptive coping strategies by teenagers, such as weakened psychological well-being, health issues, revictimisation, and inadequate protective factors while facing trauma. Contrary to previous findings that ACEs explain



various health disparities, this study suggests that the higher prevalence of ACEs alone does not account for TDVV disparities across sexual orientations. Instead, the cluster of negative consequences associated with childhood maltreatment, particularly among multi-gender youth, is more critical in explaining their increased risk for dating victimisation.

Most of the studies discussed in this section, or included in the 30 search results, elucidated the importance of addressing social and cultural norms or values, with some evaluating community programs or pointing to directions for education and policymaking. It would be fitting to conclude this section by mentioning a study in the USA (Banyard et al., 2022), which evaluated the effectiveness of its Youth-Led Sexual Violence Prevention Program among adolescents. This research suggested that the impact of out-of-school prevention events on youth behaviour depends on more vigorous engagement than one-time contacts. Alongside the study of Quebec youth's dating by Petit et al. (2023), it is safe to conclude that continuous evaluation, updates, and research on the topic of ACEs are important to prevent future incidents.

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## PROSOCIAL BEHAVIOUR

After refining the search criteria 29 results were generated, amongst which 4 articles were selected for their high relevance to the topic. Liu et al., (2021) were interested in a large scale of ACE experience – an earthquake in China. They demonstrated in their research that social support was a factor to promote prosocial behaviour for those threatened by natural disasters (earthquake). Scholars in the Czech Republic identified potential protective factors that could be adopted therapeutically or in school, as social support, to tackle violence prevalence of the teenagers who experienced

violence in personal history (Skřivánková et al., 2023). In their research, the Structured Assessment of Violence Risk in Youth (SAVRY) was used to conduct the measure with protective factors: prosocial involvement, strong social support, strong attachments and bonds, positive attitude toward intervention and authority, strong commitment to school and work, resilient personality.

Scott and Keller (2023) focused on a smaller scale of social circle – the family in the USA. It was found that parents with drinking problems are directly related to children's asocial behaviour. O'Toole et al. (2017) proposed two factors that could reduce aggression in children although they could not predict prosocial behaviour in their study in the UK.

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## CHAPTER 3 - SOCIOECONOMIC STATUS AND SCHOOLING

In the following two sections, literature related to the relationship between ACEs and socioeconomic status; and ACEs and schools or schooling was reviewed. To this end, peer-reviewed articles were selected from Social Sciences and Humanities journals in databases that included: Humanities Abstracts (hma), Humanities Source, International Political Science Abstracts, MAS Ultra - School Edition, Social Sciences Abstracts (H.W. Wilson), Social Sciences Full Text (H.W. Wilson), Women's Studies International.

The search through these databases found 14 sources that showed the relation between (or the effects of) ACEs and children, adolescents, schools, and socioeconomic status. Filtering for peer-reviewed articles, brought down the results to 12 articles. Further one article from each section was excluded due to irrelevance. The 10 articles reviewed are categorised and summarised as follows:

### SOCIOECONOMIC STATUS (SES)

The studies in this section highlight that SES is a risk factor for ACEs that cuts across generations and ethnicities, while socioeconomic well-being is a protective factor against the negative effects of ACEs.

### BIPOC, IMMIGRANT COMMUNITIES

In a study that focused on diverse demographics including socioeconomic status, Toombs et al. (2022) found that Indigenous communities across Canada continue to experience more ACEs because of intergenerational trauma, and possibly the health disparities within these communities may be associated with ACEs. Likewise, under-

employment is a post-migration stressor and a risk factor for IPV among Canadian Muslim women, many of whom also experienced ACEs as a pre-migration stressor. Alghamdi et al.'s (2022) study examined the pre- and post-migration stressors that underlie Canadian Muslim women's experience of IPV showing that this group of women faces a higher risk of IPV than those from the majority population.

Although Walsh et al (2019) undertook their study in the UK, it produced important results: The lower socioeconomic position of a child is associated with a higher risk of ACEs or maltreatment. The study, a scoping review, advised any future policy to take into account the child's SEP. However, it does not ascribe the reason for this association.

## FAMILIAL SUPPORT AS PROTECTIVE MECHANISM

Zhang et al.'s (2024) study of US community-dwelling adults determined that socioeconomic status and the presence of a protective adult in childhood reduced the association between childhood neglect and health problems later in life. Similarly, Uddin et al.'s (2024) study in Bangladesh found family resilience, including socioeconomic well-being, as a protective factor against the negative effects of two types of ACEs – threat and deprivation – on children's mental health and development.

In the context of parenting, Steele et al.'s (2016) US study shows an association between ACEs and parenting distress among the low SES group. It proposes parental ACEs screening in prenatal and paediatric situations to avoid intergenerational transmission of risk accompanied by distressful parenting in this socioeconomic group.

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## SCHOOLING

This section focuses on children with ACEs in various grade-level school settings (e.g. high school and preschool) and their experiences and behaviour at school. The following four studies reviewed present diverse experiences and impact.



## DISCIPLINARY EXPERIENCES

Sanders (2022) explains the experiences of high school students who have experienced childhood adversity, including school and neighbourhood violence, systemic racism and inequity, but are also subject to disciplinary exclusion (suspension or expulsion) from schools for their unsafe behaviours like possessing alcohol, drugs, weapons, engaging in sexual or physical assault, robbery, threatening, bullying. The study highlights the importance of acknowledging the traumatic and adverse experiences the disciplinarily excluded students face.

In a US study on preschool students, Zeng et al (2019) found that with an increment of each unit of ACEs, the chance of students' suspension / expulsion increased. The ACEs included witnessing domestic violence, mental illness, adult substance abuse, victim of violence, living in high poverty, divorced parents, and parent incarceration. The study recommended cross-departmental collaboration and family support to mitigate the situation.

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## IMPACT ON LEARNING AND BEHAVIOUR

In a Swiss preschool's therapeutic program, Ziv et al (2018) found that children with emotional and behavioural problems due to ACEs showed better social skills and learning than those without ACEs, as reported by the staff. In contrast, the caregivers of children with ACEs believed them to have lower social skills. The study also found a positive relationship between caregivers' ACEs and negative effects for caregivers and children.

Similarly, Wang et al.'s (2022) study on preschool children in China concluded that preschool children of mothers with ACEs are more likely to have behavioural health problems. However, the study acknowledged that further research was required to investigate the mechanism for this negative influence.

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## CHAPTER 4 - DEMOGRAPHICS IN CANADA; PREVENTION AND INTERVENTION

### METHODOLOGY

This Knowledge Synthesis examines adverse childhood experiences (ACEs) within mostly the Canadian context, and a few were combinations of US, Canada, Australia, and UK. A total of 59 peer-reviewed sources on ACEs were identified, from which 23 journals were selected based on their recent publication between 2015 to 2024 and relevance to key topics. Each bibliographic source was tagged with keywords such as violence, gender, ethnicity, poverty, homelessness, trauma, neglect, abuse, crime, justice, recidivism, probation, intervention, and prevention. The focus areas included the relationship between ACEs and First Nations, gender victimisation, immigrants, homelessness, and intervention and prevention strategies. All selected sources were organized and managed using the Zotero data management program. The summary of subjects and abstracts are as follows:

### FIRST NATIONS IN CANADA

Seven peer-reviewed journals focused on the relationship between ACEs and First Nations populations. Five of these examined the physical and mental health outcomes of First Nations adults with ACEs in Canada, highlighting their continued experience of significant health disparities compared to non-First Nations populations. However, one of the journals expanded the scope of their research to other countries — US, Australia, and Greenland — due to a preliminary lack of adequate resources (Radford et al., 2022). The remaining two journals explored the association between

ACEs and recidivism within First Nations communities in Canada, US, Australia, and Inuit in Greenland.

### ***First Nations' ACEs and Health Disparities***

Recent research on Adverse Childhood Experiences (ACEs) and Indigenous health disparities in Canada highlights the profound and lasting effects of historical and intergenerational trauma. Studies indicate that First Nations and Inuit populations face elevated rates of chronic diseases, mental health challenges, and suicidality, largely influenced by ACEs linked to residential schools, child welfare involvement, and systemic inequalities (Radford et al., 2022; Toombs et al., 2024).

The ACEs model, which measures abuse, neglect, and household dysfunction, reveals significantly higher ACE exposure among Indigenous populations compared to non-Indigenous groups. These experiences contribute to ongoing health disparities and chronic conditions, particularly among First Nations adults seeking substance use treatment (Toombs et al., 2024). Protective factors such as cultural identity, education, social support, and psychological resilience play a crucial role in mitigating these effects (Radford et al., 2022).

Research further emphasises that parental attendance at Indian Residential Schools increases the risk of suicidal thoughts and attempts, with gendered and age-specific variations. The impact is particularly severe for Indigenous youth, necessitating culturally relevant early interventions (Bombay et al., 2019). Additionally, studies on Nunavik Inuit populations identify distinct childhood adversity profiles linked to

socioeconomic and community factors, further reinforcing the need for holistic, culturally informed approaches to Indigenous health and well-being (Lafrenaye-Dugas et al., 2024).

A comprehensive framework that balances physical, emotional, spiritual, and mental health is essential in addressing these challenges and promoting resilience across Indigenous communities (Toombs et al., 2022).

### ***ACEs and Recidivism in First Nations Adults***

Research examining the link between Adverse Childhood Experiences (ACEs) and recidivism highlights the significant role of trauma in the overrepresentation of Indigenous peoples in the Canadian justice system. Indigenous youth have been found to have higher ACE scores and recidivism rates compared to their non-Indigenous counterparts, with ACEs serving as a key predictor of repeated justice system involvement (Muir, 2020). Despite this, youth probation officers (YPOs) rarely consider ACEs in their case formulations, and trauma-focused interventions remain uncommon for Indigenous youth with high ACE scores (Muir, 2020).

Further research underscores the importance of addressing ACEs through culturally relevant trauma interventions to reduce recidivism among Indigenous populations. Muir and Viljoen (2022) recommend incorporating Indigenous-specific support systems and advocate for continued research on the role of colonialism in justice system overrepresentation. Implementing ACE screenings and trauma-informed approaches tailored to Indigenous experiences could contribute to more equitable justice outcomes (Muir & Viljoen, 2022).

By integrating ACE screenings and culturally responsive trauma-informed approaches, the justice system could better address the root causes of recidivism among Indigenous populations, ultimately working toward more equitable outcomes.

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## GENDER VICTIMISATION: SEXUAL AND GENDER MINORITIES (SGM)

Research indicates a strong link between Adverse Childhood Experiences (ACEs) and mental health disparities among gender and sexually diverse (GSD) individuals. Emotion regulation difficulties have been identified as a key factor in the relationship between childhood adversity and post-traumatic stress symptoms (PTSS) among youths, with GSD youth experiencing significantly higher exposure to adverse events compared to their heterosexual, cisgender peers (Ramos et al., 2022). This cross-sectional study aimed to examine the mediating role of emotion regulation difficulties in the associations between cumulative childhood adversity and PTSS than HC youth, emphasising the need for targeted mental health interventions (Ramos et al., 2022).

Further research demonstrates that sexual minority individuals face disproportionately higher rates of ACEs, including physical, emotional, and sexual abuse, as well as household dysfunction (Andersen & Blosnich, 2013). These experiences contribute to long-term mental health disparities, with ACEs mediating the association between sexual minority status and poor mental health outcomes (Blosnich & Andersen, 2015). However, the article could not identify any clear reasons for these sexual disparities in childhood adversity. In the article also noted that some researchers believe that the childhood adversity (particularly sexual abuse) may play a casual role in the development of same-sex preferences and or sexual minority identity. Among Canadian adolescents, sexual and gender minority (SGM) youth report lower life satisfaction and higher internalising symptoms, with peer and family adversity playing a significant role in these disparities (Galarneau & Malti, 2024).

These findings underscore the necessity of incorporating ACE assessments in research and clinical practice to better understand and address the developmental risks faced by GSD individuals. Culturally responsive, trauma-informed interventions may help mitigate the mental health challenges associated with childhood adversity in these populations.

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## PSYCHOSOCIAL HEALTH OUTCOMES AMONG IMMIGRANTS IN CANADA

The objective of the study was to examine the association between childhood adversity and psychosocial health outcomes among immigrants in Canada. Research highlights the lasting impact of Adverse Childhood Experiences (ACEs) on the psychological health of immigrants in Canada. Based on this research, childhood adversity, including physical and sexual abuse, has been shown to significantly influence

long-term mental health outcomes on all groups especially immigrants. Kuuire (2020) examined the association between childhood adversity and psychosocial health outcomes among immigrants, revealing that individuals who experienced physical abuse before age 15 had a 29% higher likelihood of developing a psychological condition and a 31% increased likelihood of poor self-rated mental health. Similarly, childhood sexual abuse was associated with a 28% increased likelihood of poor self-rated mental health, emphasising the enduring effects of early trauma on immigrant populations (Kuuire, 2020).

In addition to direct psychological impacts, in further Massing et al. (2023) examines the post-migration experiences of Syrian refugee children, particularly with post war experiences and how ACEs influences the educational experiences of refugee-background children. Massing et al. (2023) investigated the schooling experiences of Syrian refugee children in Canada, highlighting the role of adversity in shaping educational outcomes. Using a qualitative interpretive approach, the study identified key themes such as educational loss, safety concerns, and resource accessibility. Despite facing significant hardships, refugee-background children demonstrated resilience, underscoring the importance of creating inclusive educational environments that support their psychosocial well-being (Massing et al., 2023).

These findings suggest a critical need for trauma-informed mental health and educational interventions tailored to immigrant and refugee populations. Addressing the psychological consequences of ACEs through culturally sensitive support systems can help mitigate long-term adverse effects and promote overall well-being.

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## HOMELESSNESS AND MENTAL HEALTH

Research consistently highlights the strong link between Adverse Childhood Experiences (ACEs) and the heightened risk of homelessness, poor health, and severe mental health disorders. Homeless adults report a disproportionately high ACE prevalence, with 89.8% experiencing at least one ACE and 53.9% reporting four or more (Liu et al., 2021a). As systematic review and meta-analysis studies samples of adults experiencing homelessness in the USA, Canada, and the UK. This review confirms that ACEs are associated with increased rates of suicidality, major depressive disorder, substance misuse, and victimisation among homeless individuals, emphasising the need for policy interventions to address these long-term consequences (Liu et al., 2021a).

Further research examining homeless adults with mental illness in Canada found an average ACE score of 4.44 (standard deviation (SD): 2.99). Total ACE score was positively associated with several mental illness diagnoses and psychopathology severity. (Liu et al., 2021b). The study revealed gender differences, with women reporting higher ACE prevalence, while men showed stronger associations between specific ACE dimensions and poor mental health outcomes. These findings suggest that ACE exposure

is a critical determinant of mental health severity among homeless populations and that gender-specific interventions may be necessary (Liu et al., 2021b).

Youth transitioning from child protection services (CPS) are particularly vulnerable to homelessness and its associated adverse outcomes. Bonakdar et al. (2023) analysed data from the *2019 Without a Home: The National Youth Homelessness Survey* (n = 1,375), identifying ACEs and CPS involvement as significant risk factors for homelessness. Youth leaving CPS face an elevated risk of physical and mental health deterioration, school disengagement, justice system involvement, and substance use disorders. Controlling demographic factors, the study confirmed that ACEs and CPS history are strong predictors of homelessness, underscoring the need for targeted policy measures to support this at-risk group (Bonakdar et al., 2023).

These studies collectively reinforce the importance of trauma-informed approaches in homelessness prevention and mental health services. Addressing ACE-related vulnerabilities through early interventions, gender-sensitive programs, and policies aimed at reducing childhood adversity could be key to mitigating the long-term consequences of ACEs and reducing homelessness among vulnerable populations.

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## TECHNOLOGY-ASSISTED INTERVENTIONS AND SOCIAL SUPPORT IN MITIGATING ACES-RELATED MENTAL HEALTH OUTCOMES

Adverse childhood experiences (ACEs) have been widely recognised as significant contributors to mental and physical health challenges across the lifespan. The growing body of research underscores the importance of early intervention, technology-assisted parenting programs, and the integration of digital health technologies in mitigating ACE-related risks and improving child and family well-being (Aldridge et al., 2024; White et al., 2024).

Aldridge et al. (2024) highlights the strong association between ACEs and youth mental health disorders, emphasising the role of community-based parenting interventions in addressing modifiable ACEs. Their study introduces the Parenting Resilient Kids (PaRK)-Lite intervention, a co-designed technology-assisted parenting program that employs podcasts and micro-coaching to support parents. Initial findings suggest that this hybrid approach enhances parental empowerment and reduces service dependency, demonstrating the potential for technology-driven interventions to effectively engage parents and service providers.

Further exploring the efficacy of engagement strategies in technology-assisted parenting programs, Aldridge et al. (2024) conducted a systematic review identifying five



key strategies associated with increased parental engagement: co-designing interventions with parents, online delivery, personalisation, user control features, and practical support. However, professional support features, video content, and behaviour change techniques showed inconsistent results in boosting engagement. The study underscores the need for standardised engagement definitions and measurement tools to enhance systematic evaluations of these programs.

On a broader scale, Madigan et al. (2023) conducted a meta-analysis examining the global prevalence of ACEs (206 studies from 22 countries, with 546, 458 adult participants), finding significant disparities across populations. Their findings reveal that individuals with a history of mental health conditions, substance abuse, low-income status, and homelessness are at a significantly higher risk of experiencing multiple ACEs. Additionally, racial and ethnic disparities were evident, with Indigenous / Native American participants reporting the highest prevalence (40.8%) compared to White and Asian groups (12%). These disparities underscore the need for targeted interventions to address systemic inequities. The study emphasises ACEs as a critical global public health issue requiring both preventive and intervention-based solutions.

Providing a comprehensive review of ACEs research over the past two decades, Asmundson and Afifi (2020) examine the relationship between ACEs and various health outcomes, including mental illness, physical health conditions, and violence across the lifespan. Their work also discusses methodological considerations, the importance of trauma-informed care, and the role of resilience-building strategies. The book serves as

a valuable resource for professionals working across disciplines to address the long-term impacts of ACEs and inform future policy and practice.

White et al. (2024) explore the role of digital health technologies (DHTs) and artificial intelligence in screening and mitigating the risks associated with ACEs. The research was conducted by examining the existing peer-reviewed literature from 3 databases: PubMed, SSRN, and Google Scholar and published between August 2017 and August 2022. Their narrative review highlights the potential of DHTs to improve mental health outcomes for children and adolescents by addressing conditions such as PTSD, suicidal ideation, anxiety, and ADHD. The study also identifies challenges related to DHT implementation, including privacy concerns and regulatory barriers, while emphasising the need for ethical and secure deployment of digital solutions to support childhood resilience and well-being.

Recognising the necessity of workforce education, Kapp et al. (2024) developed and evaluated an online ACEs training program tailored for healthcare providers in Missouri, particularly in rural areas where ACE prevalence is higher. Their findings indicate strong engagement and positive reception among providers, highlighting the effectiveness of online continuing education in increasing ACE-related knowledge and its application in clinical practice.

Lastly, Brenas et al. (2019) introduce an ACEs Ontology designed to integrate and structure data related to ACEs, facilitating better surveillance, research, and intervention design. By employing advanced semantic web tools, the ontology serves as a valuable

resource for mental health practitioners and researchers, enabling improved ACEs monitoring and policy development.

Collectively, these studies underscore the urgent need for targeted interventions, digital innovations, and professional training to mitigate the long-term consequences of ACEs. As research in this field evolves, interdisciplinary and technology-driven approaches will play a crucial role in reducing ACE prevalence and improving outcomes for vulnerable populations.

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## CHAPTER 5 - HEALTH CONCERNS

An initial search of ACES and Canada, along with the terms of 'pregnancy', 'health', and 'substance use' was conducted. Efforts were made to prioritise Canadian articles. However, American articles have been included and identified as such. Articles were subjectively chosen, with the author's background in healthcare informing the selection process.

19 articles regarding pregnancy were identified, of which 11 were used for the purposes of this review. Four main themes emerged in the research: discourse surrounding child development and intergenerational effects of ACES; physical and mental health surrounding pregnancy and motherhood; the necessity of ACES screening in Pregnancy; and Substance Use in Pregnancy. Canadian data focused mainly on mental health during pregnancy, and child development and in relation to maternal ACES. American studies were included to aid in the depth of the analysis.

An initial search of ACES and health or physical health and Canada returned 107 results. Of these 107 results, nine were selected based on relevance to the topic. Literature from both American and Canadian studies highlights an association between adverse childhood experiences and long-term health outcomes. The following studies emphasise the links between ACEs and physical and mental health challenges in adulthood. The synthesis also includes information on resilience-building, early intervention, and improved screening processes in healthcare.

54 articles were found on the topic of substance use and ACEs. Of which nine were utilised. Key themes identified within these articles included types of substance use, the impact of different forms of abuse on later substance use, and protective factors.

## PREGNANCY

### ***Child Development and The Intergenerational Effects of Maternal ACEs***

Three Canadian studies and one US-based study by Shin, et al. (2023) examined the impact of Maternal ACEs on future child development. Women who experienced adverse childhood experiences and later became mothers were found to exhibit the intergenerational effects of ACEs, influencing their own children's development (Benzies et al., 2021; Heatherington, et al., 2020; McDonald et al., 2019; Shin et al., 2023). Research suggests that the intergenerational effects of ACEs could be mediated by maternal mental health (Benzies et al., 2021). However, in another study Heatherington et al., (2020) propose that the intergenerational effects may be due to ACEs' impact on parenting stress. Heatherington et al. (2020) also acknowledge that mothers who experience childhood adversity are more likely to have lower socioeconomic status or unstable social situations, leading to negative child outcomes or behavioural issues.

A recurring theme in literature is the influence ACEs may have on parenting behaviour, particularly hostile parenting, which is associated with child behavioural issues (Heatherington et al., 2020; Shin et al., 2023). Mothers who experienced three or more ACEs in childhood were more likely to have children with increased levels of anxiety, aggression, hyperactivity, and abnormal temperaments (McDonald et al., 2019). Shin et al. (2023) found that increased ACE scores were associated with an elevated risk of



parent-child aggression and lower levels of parental empathy. Additionally, women in the high ACE category report more favourable views on corporal punishment and inappropriate expectations of children (Shin et al., 2023).

Maternal mental health also plays a role in determining children's behaviour. Maternal ACEs are observed to indirectly influence child behaviour and development through mechanisms of perinatal depression and anxiety (McDonald et al., 2019; Shin et al., 2023). The mechanisms underlying the association between maternal mood and child development may be related to biological (i.e. epigenetic) or environmental reasoning (McDonald et al., 2019).

### ***Physical and Mental Health in Pregnancy***

Six articles included information related to health during pregnancy. Surprisingly few studies on physical health in pregnancy beyond substance use. Most emphasised mental health in pregnancy as it relates to ACEs. Adverse childhood experiences place women at higher risk for clinical health issues such as prenatal depressive symptoms, anxiety, and substance use during pregnancy (Racine et al., 2022). McDonald et al. (2019) found that an ACE score of three or higher was associated with increased rates of perinatal smoking, binge drinking, mood symptoms, heightened neuroticism, and lower optimism and reduced parenting confidence.

Pregnancy is an emotionally vulnerable time, and entering this period may amplify the negative impacts of elevated ACE scores (Currie & Tough, 2021). The vulnerability of pregnancy can be exacerbated by limited social or familial support for women with high

ACE scores, making it more difficult to seek help during pregnancy challenges (Currie & Tough, 2021).

An American study by Unternaehrer et al. (2019), indicated that adverse experiences in childhood can impair a woman's mental wellbeing, thereby decreasing her psychological resources available for parenting. The relationship between maternal ACEs and mood and substance use in pregnancy appears to follow a dose-response pattern (Racine et al., 2022). Therefore, early adversity appears to be a risk factor for both mental health and health related behaviours in pregnancy (Racine et al., 2022).

When it comes to physical health in pregnancy, research seems to be more limited and inconclusive. Racine et al. (2018) noted associations between physical health conditions such as gestational hypertension, gestational diabetes, and poor birth outcomes. Furthermore, An American study by Zak-Hunter et al. (2023) found links between ACEs and a number of pregnancy and postpartum health conditions such as asthma, gastrointestinal conditions, and type two diabetes. However, beyond these two studies, research on the connection between ACEs and physical health is limited.

### ***ACEs Screening and Parenthood***

Research consistently supports that screening for ACEs in pregnancy can play an important role in mitigating risks for women (Racine et al., 2020; Currie & Tough, 2021; Zak-Hunter et al., 2023). A trauma-informed approach to patient care holds potential to mitigate ACE associated risk behaviours in pregnancy and the transition to parenthood (Racine et al., 2020). Identifying supportive resources and coping strategies can play an important role in mitigating risks for women with a history of adversity (Racine et al.,

2020). Currie and Tough (2021) further emphasise the need for research to identify mediating factors for ACEs and pregnancy. Universal screening may aid in identifying individuals at higher risk for clinical complications (Zak-Hunter et al., 2023).

Prenatal programming has also been shown to be significant for women with adverse experiences. Prenatal Programming was found to be associated with a reduction in perinatal depressive symptoms (Benzies et al., 2021). Social support is recognised as a powerful tool in mitigating the long-term impacts of childhood adversity (Racine et al., 2019). Unternaehrer et al. (2019) found that adversity in childhood's effect on later parenting stress and mood imbalances could be buffered through psychotherapeutic interventions, such as cognitive behavioural therapy. As noted above, several researchers highlighted the importance of finding effective strategies to mediate the effects of ACEs on pregnancy and early parenting.

### ***Substance Use***

Substance use in pregnancy is also linked to maternal ACEs. A dose-response relationship exists between the number of adverse childhood experiences and substance use — including alcohol, drug use, smoking (Racine et al., 2020). Higher ACE scores (four or more) are associated with an increased risk of illicit substance use in pregnancy (Currie & Tough, 2021). One possible explanation for the relationship is the emotionally destabilising nature of pregnancy. Currie and Tough (2021) propose that reward-seeking behaviour may play a role in substance use in response to this emotional instability.

Notably, Currie and Tough (2021) found that the association between substance use in pregnancy and ACEs persist even in the presence of protective measures such as

higher education, marriage, and high-income status. Currie and Tough (2021) emphasise the importance of including women across the socioeconomic spectrum in community samples to obtain a fuller understanding of the motivators for substance use in pregnancy.

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## HEALTH

### ***ACEs and Health Conditions***

Brennenstuhl and Fuller-Thompson (2015) acknowledge that ACEs have been increasingly linked to migraine headaches in adults. Notably, research has suggested that migraine headaches are higher in those who have experienced specific adversities — such as witnessing violence, sexual violence, and physical violence. Interestingly, Brennenstuhl and Fuller-Thompson (2015) found that these three early exposures accounted for migraine headaches in both men and women, even after adjustment for differing health habits, anxiety and depression, and socio-demographics.

Dobson et al., (2021) note that while mental health and ACEs are extensively researched, the link between physical health and ACEs remains relatively unexplored. However, an American study by Afzal et al. (2024) identified ACEs as one of the top five predictors for four chronic health conditions: asthma, coronary heart disease, depressive disorder, and pulmonary disease. Specifically, research has demonstrated that the more ACEs a person experiences, the higher their risk of developing physical health

challenges, unhealthy lifestyle behaviours, mental health challenges, and social underachievement (Ross et al., 2020).

A US-based study found that high exposure to ACEs is independently associated with various mental health problems such as depression, substance use, antisocial behaviours, and personality disorders, as well as the risk of developing chronic physical conditions and diseases later in life (Alradhi et al., 2022).

Poor oral health and multimorbidity has also been linked to ACEs (Hensel et al., 2025). Interestingly, middle-aged women seem to be the most vulnerable to the impacts of ACEs on their oral health. (Hensel et al., 2025). The heightened vulnerability of women to the health consequences of adversity in childhood has been documented previously (Hensel et al., 2025).

### ***Multiple ACEs and Health Outcomes***

Experiencing multiple ACEs increases the risk of developing physical and psychosocial difficulties later in life (Ross et al., 2020). The three most common ACEs reported with poor health were living with someone with substance use, having a parent with mental health issues, or experiencing parental separation (Ross et al., 2020).

### ***Resilience Factors***

Resilience and protective factors against ACEs are found in both community and relational resources. According to Ross et al. (2020), several studies have demonstrated that high levels of resiliency factors can decrease the negative physical and psychosocial effects of ACEs in later life. Resiliency factors vary, but may include individual



characteristics, presence of a trusted caregiver, the development of healthy attachment bonds, and access to community resources. These factors can act proactively by buffering the long-term impacts of adversity (Ross et al., 2020).

### ***Vulnerability***

Indigenous populations represent a particularly vulnerable population within Canada. In a study exploring the relationship between ACE scores and health outcomes in the context of intergenerational trauma, Toombs et al. (2024) found that indigenous people undergoing substance use treatment in Canada were likely to report higher than average ACE scores (five or more) and reported higher than average instances of chronic disease. Disease prevalence included higher than average kidney disease, stroke, intentional self-harm, diabetes, respiratory diseases and higher self-reported mental disorders such as anxiety, PTSD, and depression. Notably, mean ACE scores were higher among those whose family members attended the residential school system. Toombs et al. (2024) emphasised the need to examine particularly disadvantaged individuals who experience a disproportionate frequency of health adversity.

The Covid-19 pandemic exacerbated the vulnerability of young adults already suffering from mental health issues (Alradhi et al., 2022). The pandemic presented a dual burden for those already impacted by ACEs and mental health issues. Alradhi et al. (2022) identified that young Canadian adults with high ACE profiles were more susceptible to the emotional and relationship stressors that came with the pandemic.

### ***Limitations and Gaps in ACEs Health Research***

Several gaps and limitations exist within the study of ACEs and Health (Smith et al., 2021). The ACE scoring system itself, the 'normality' of levels of adversity within a certain population, and the geographical limitations of certain studies are among the shortcomings of ACE research (Smith et al., 2021; Ross et al., 2020). Smith et al. (2021) make two noteworthy observations about ACE limitations. First, the ACE scoring system itself is flawed in that it only assesses a limited number of adversities, and it is dependent on the recollection of events experienced as children, which may present issues of recall bias. Second, normal levels of adversity can vary greatly from population to population, undermining the generality of some research. For example, studies looking at health outcomes often review those people who may have experienced minimal adversity. In a study of unhoused Indigenous populations, only 18 percent of respondents had an ACE score less than 4, indicating the need for comprehensive population studies. Additionally, Ross et al (2020) underscore the importance of including both urban and rural populations in ACE research. Rural populations are often neglected in Canadian studies on health ailments; often urban areas are focused on.

Furthermore, it has also been suggested that the current ACE questionnaire is limited in that it fails to account for common childhood adversities such as family financial problems, loss of a family member, food insecurity, and cultural norms or social stigmatisation. Notably, significant experiences such as residential school attendance and intergenerational trauma are disincluded from standard ACE frameworks (Smith et al., 2021).

### ***Role of Formal Healthcare in Mediating ACEs***

The mitigation of ACEs in Canada, especially within the context of health care, is an incredibly important task given that the prevalence of ACEs is thought to be as high as 40% among Canadian adults (Hensel et al., 2025). Smith et al. (2021) suggest that formal health care has an essential role in mediating illnesses linked with ACEs, and that the physical and substance use issues can be reduced through the provision of services. Intervention programs and engagement with the primary care setting may thwart the negative effects of ACEs by identifying those affected and involving them in follow up care (Korotana et al., 2016). While literature advises that ACEs are a significant factor in individuals' likelihood for poor health outcomes, little is being done to monitor ACEs in the broader health care setting (Smith et al., 2021). Major adaptations to the Canadian health care system may aid in mitigating the damaging effects of ACEs. These could include formal ACE training, the allocation of resources to ACE associated mental health, and more focus on prevention and early intervention (Smith et al., 2021; Afzal et al., 2024; Toombs et al., 2024). Such interventions could lessen negative health outcomes associated with ACEs.

### ***Individual Assessment of ACE scores***

Dobson et al. (2021) highlight the importance in individually assessing ACE scores, noting that a simple tally of ACE scores lacks the nuance needed to properly assess the complex relationships between forms of adversity and their long-term health consequences. Evaluating the type and severity of each ACE may enhance the research into ACEs and increase rates of physical and mental health outcomes.

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## SUBSTANCE USE

Nine articles discussed substance use and its relationship to ACEs, including five American studies by Baiden et al (2022), Boppre and Boyer (2021), Meadows et al. (2024), Schwartz et al. (2023), and Zhen-Duan et al (2023). Cigarette smoking, opioid use, binge drinking, and cannabis use were all found to be associated with childhood adversity (Chai & Xue, 2023; Meadows et al., 2024; Afifi et al., 2023; Fortier et al., 2022; Baiden et al., 2022; Boppre and Boyer, 2021; Fuller-Thompson et al., 2016; Schwartz et al., 2022; Zhen-Duan et al., 2023). While Fuller-Thompson et al. (2016) found that a greater share of men with ACEs report substance use, gender differences were not found to be significant moderating factor. However, some authors identified that women who experienced ACEs were at a higher likelihood for binge drinking and that substance use is the most common adverse response in women following childhood adversity (Boppre & Boyer, 2021; Baiden et al., 2022). Boppre and Boyer acknowledged that certain ACEs were more likely to relate to substance use, these include sexual abuse, emotional abuse, a loved one's death, or a family member with substance use disorder.

In addition, direct forms of ACEs seem to be more strongly related to substance use than indirect forms. Direct forms such as physical or sexual abuse were more associated with drug dependence than other forms of ACEs, while alcohol use varied little across ACE types (Fuller-Thompson et al., 2016; Schwartz et al., 2022). Of note, a dose-response relationship exists between ACEs and substance use — as ACEs accumulate there is a corresponding increase in substance use risk (Schwartz et al., 2022). Chai and Xue (2023) describe substance use as a coping reaction to the adversity experienced.

Protective factors may mitigate substance use in youth. Afifi et al. (2023) identified that factors at the level of individual, family, and community levels have power in reducing the risk of substance use in adolescents. Familiarity with one's own culture or language, appropriate sleep, future planning, school activity involvement, having a trusted adult, sharing family meals, parental trust, volunteering, and community engagement were all associated with reduced risk of substance use (Afifi et al., 2023). Additionally, Meadows et al. (2024) identify that primary prevention, ACEs screening in adolescence, and early intervention may help to reduce the risk of substance use later in life. Baiden et al. (2022) also note that the correlation between ACEs and drug use correlates to a greater number of social risk factors including homelessness, legal access, and limited access to food, further underscoring the need for intervention.

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## APPENDIX A: EXAMPLE OF SEARCH METHODS

Procedures adopted in article searching for section The Psychology of Adverse Childhood Experiences (ACEs) and Social Behaviours.

Under a Boolean search mode, all results generated below contained four levels (rows) of keywords connected by the connector “AND.” The first three levels of searching keywords remained unchanged. The first level contained “child\* OR girl\* OR boy\* OR youth OR adolesc\*,” which limited the search relevant to ‘childhood’ experience. The second level contains “adverse experience\* OR trauma OR violence OR assault OR abus\* OR rape OR batter\*,” which defines the adverse experience. The third level was “Gender OR Sex,” which brought the result to more gender- and sex-specific articles.

The fourth (last) level is the only variable with keywords changing to generate the results. For the fourth level of keywords, the words adopted and the first-time search result is stated respectively: “corporal punishment – 19 results”; “physical discipline OR Punishment” – 87 results; “parenting,” – 332 results; “individualism OR collectivism” – 21 results; “social norm OR Traditional values” – 215 results; “prosocial behaviour” – 48 results; “Consequence OR Impact” – 2,319 results; “violen\*” – 3,296 results; “aggress\*” – 819 results; and “impuls\*” – 193 results. From the first search attempt, it is obvious that a lot of these keywords yielded an unproductively huge amount of search results yet most of the articles are irrelevant to the topic of this Chapter. In the second search attempt, a filter “Abstract only” is applied to the first two levels of keywords in an attempt to reduce the number of search results, the results obtained are roughly 5% less. The number of search results only reduced noticeably when the filter “Title only” is applied to the first two

levels of key words. The searching results of each of these fourth level keywords are discussed in the paragraphs that follow.

After the second search, keywords were selected for this knowledge synthesis owing to practicability and their implications to the topic. These keywords are: “corporal punishment”, “physical discipline OR Punishment”, “parenting”, “individualism OR collectivism”, “social norm OR traditional values”, prosocial behavior(u)r”.



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