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Adverse Childhood Experiences (ACEs)

Interventions to Prevent and Mitigate the Impact of ACEs in Canada

Literature Review

August 2020

Public Health Ontario

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This document is intended to assist public health practitioners in decision-making by describing a range of generally acceptable approaches for addressing the effects of adverse childhood experiences (ACEs). This document should not be considered inclusive of all programs or interventions, or exclusive of other programs or interventions reasonably directed at obtaining the same results. The ultimate judgment regarding investment in public health programming must be made by the public health unit in light of the local needs of the community. The application and use of this document is the responsibility of the user. PHO assumes no liability resulting from any such application or use.

Contents

Executive Summary

Adverse Childhood Experiences (ACEs) are defined as potentially traumatic events, such as emotional, physical or sexual abuse experienced in the first 18 years of life. Preventing ACEs has been proposed as an upstream intervention to impact physical and mental health and health-related behaviours, such as substance use. The objective of this study was to identify effective public health approaches implemented in Canada to prevent or mitigate the impact of ACEs.

A search for peer-reviewed literature was conducted by Public Health Ontario's Library Services using four databases: MEDLINE, EMBASE, PsycINFO and SocINDEX. Inclusion criteria were primary studies published in the past 10 years, conducted in Canada and assessment of a program or intervention that addressed one or more ACEs. Two independent reviewers screened titles and abstracts, followed by full-text articles and conducted quality appraisal on the included studies.

A total of 1,071 potentially-relevant references were identified by the search, of which 96 full-text articles were retrieved and screened. Thirty-two of those articles were assessed for quality with data extracted. Most studies (N=17) were identified as moderate quality, nine studies were identified as strong quality and six studies were identified as weak quality. There were 26 different programs described from six provinces: Ontario, Québec, Alberta, British Columbia, Manitoba, and Saskatchewan. Programs were conducted in four main settings: home, school, community or in a clinic/healthcare setting. The goal of 60% of the programs was to focus on prevention of a known ACE. The main ACEs that were targeted included child exposure to intimate partner violence, substance use by a parent and child maltreatment.

Strategies to address ACEs in Canada were heterogeneous and implemented in many settings by multiple organizations across varied sectors, including public health, social services and health care. Most programs targeted only one of the 10 ACEs and required strong partnership with additional community agencies involved in children's services. Preventing and mitigating the impacts of ACEs through strategies such as building resilience and supporting the awareness of ACEs in public health programming may be the next steps for supporting communities.

Introduction

What are ACEs?

Adverse childhood experiences (ACEs) are potentially traumatic or stressful events occurring in the first 18 years of life. The list of commonly recognized ACEs includes emotional, physical or sexual abuse; emotional or physical neglect; growing up in a household with a parent or caregiver who uses alcohol or substances; has a mental health problem; exposure to intimate partner violence; separation or divorce; and criminal behaviour resulting in incarceration.[1] Although the 10 ACEs identified by Felliti et al. are well-established, there are other exposures in childhood that may cause traumatic experiences, including structural and contextual forms of trauma (see Box 1 for complete definitions). Sometimes referred to as 'adverse community experiences,' situational circumstances such as structural violence, living in extreme poverty and homelessness are also forms of adversity in childhood.[2] ACEs threaten the foundations of health (stable, responsive relationships; safe, supportive environments; and appropriate nutrition) that support healthy biological development.[3] Adversity in childhood can occur as a prolonged exposure; for example, having a parent with addiction or in a single occurrence, such as a sexual abuse event. ACEs may be mitigated by positive interpersonal experiences with family and friends[4] and by building resilience and other protective factors, such as quality of relationships.[3]

What are the Effects of ACEs?

The link between ACEs and poor health and wellbeing outcomes has been well documented.[5] Exposure to ACEs during childhood can result in toxic stress that negatively affects brain architecture (e.g., impaired neural circuits), compromises immune response and increases vulnerabilities to poor health outcomes across the lifespan.[6] Adults who experienced ACEs are more likely to report mental health conditions,[7] cardiovascular disease, diabetes and many other chronic conditions.[5] There is evidence to suggest that the increased risk for these diseases may be due to physiological changes during childhood as a result of toxic stress responses. Further, detrimental psychological effects may result in a higher likelihood that these individuals adopt poorer health behaviours, such as substance use and smoking and may have higher rates of overweight and obesity than those who did not experience ACEs.[5] There is evidence to demonstrate a dose-response relationship; as the number of ACEs an individual experiences increases, the poorer the health outcomes, including impacts on mortality. One study showed exposure to six or more ACEs may decrease lifespan by 20 years.[8] Finally, there is evidence of intergenerational effects in adults who experienced ACEs, which may impact their ability to parent their own children.[9]

What is the Burden of ACEs?

Approximately half to two-thirds of participants in population-based studies report at least one ACE. In the Alberta ACE Study, 55.8% of participants reported one or more ACE, while 20% reported three or more ACEs.[10] In England, 47% of respondents to a household survey in 2013 reported experiencing at least one ACE.[11] Data from the Behavioral Risk Factor Surveillance Survey in the US showed 59% of

respondents reported one or more ACE.[12] These prevalence estimates correspond to the initial observations made by Felitti and colleagues, who found 52% of an adult population had experienced one or more ACE.[1]

While there is no national survey on ACEs in Canada, there are available Canadian data about the prevalence of specific ACEs, including experiences of child maltreatment. In 2008, the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS) reported the rate of maltreatment-related investigations was 39.16 per 1,000 children and substantiated investigations was 14.19 per 1,000 children.[13] Rates of investigations were highest in children less than one year (51.81 per 1,000 children) and decreased with age.[13] Of those children experiencing any investigation, 34% were due to neglect, 34% due to intimate partner violence, 20% due to physical abuse, 9% due to emotional abuse and 3% due to sexual abuse.[13] Of those investigations, 18% of children were exposed to multiple categories of maltreatment. Data from child welfare services gives an indication of the burden of child maltreatment, but only captures cases that were reported and so it likely underrepresents the true burden. A 2014 study using Canadian Community Health Survey data showed a 32% prevalence of any child abuse among respondents over 12 years old and a dose-response relationship between any types of child abuse and poor mental health.[7]

Rationale for this Review

Preventing ACEs has been proposed as an upstream intervention to reduce substance use, chronic disease and improve overall health in the population. In May 2019, a group of Ontario public health units approached Public Health Ontario (PHO) for assistance with a project to better understand how public health could support programming that prevents or mitigates ACE-related harms in their communities. An ACEs Collaborative Working Group was formed between PHO and four Ontario public health units and a literature review was requested of PHO. While the research question was in development, Public Health Wales published a comprehensive report titled *Responding to Adverse Childhood Experiences: An evidence review of interventions to prevent and address adversity across the life course*,[14] henceforth known as the Wales Report, which synthesized international review-level evidence published from 2008 to 2018. This report, as well as reports published by NHS Scotland (*Rapid Evidence Review: reducing the attainment gap – the role of health and wellbeing interventions in schools*)[15] and the Centres for Disease Control (*Preventing ACEs: Leveraging the Best Available Evidence*),[16] provided new direction for our research question to focus on primary Canadian studies. The research question was: What interventions are effective at preventing, reducing or mitigating the impacts of ACEs in Canada?

Objective of this Review

The ACEs Collaborative Working Group agreed it was a priority to identify primary studies that evaluated the effectiveness of public health approaches to prevent or mitigate the impact of ACEs in Canadian children, youth and families. This would allow for this review to build on the Wales Report by providing a greater level of detail on the interventions and applicability to the Canadian context; a country with diverse populations, including Indigenous populations and public health systems that may be important

when delivering services to communities. As such, findings of this review are directly applicable to local public health units in Ontario and across Canada, where staff may be reviewing or developing programming to address ACEs in their local communities.

Box 1. Key Concepts/Definitions

Adverse Childhood Experiences (ACEs): Potentially traumatic or stressful events occurring in the first 18 years of life.[17]

Trauma: A traumatic event can involve a single experience or enduring repeated events, that completely overwhelm the individual's ability to cope or integrate the ideas and emotions involved in that experience. There are multiple types of trauma, including historical, interpersonal and external.[18]

Historical Trauma: Disconnecting certain cultures from their families, relationships and cultural practices (e.g., 60s scoop, Residential Schools, Holocaust).[18]

Interpersonal Trauma: Childhood physical or emotional abuse, sexual abuse, witnessing intimate partner violence.[18]

External Trauma: Effects of war (e.g., killing, fear of being killed, witnessing death and extreme suffering), being a victim of crime, sudden death of a loved one, living in extreme poverty.[18]

Methods

A search for interventions to prevent or mitigate the impact of ACEs was conducted by Public Health Ontario's Library Services in four databases: MEDLINE, EMBASE, PsycINFO and SocINDEX. Studies were included if they: were conducted in Canada, were primary studies published from 2009 until 2019 (i.e., the past 10 years) and assessed a program or intervention of interest that addressed one or more of the original 10 ACEs, as described by Felitti and colleagues (1998).[1] For the purposes of this review, an intervention is any effort, activity or combination of program elements designed to improve health status[19] (e.g., cognitive behavioural therapy), while a program may be a standard set of activities or curriculum (e.g., Nurse Family Partnership®). A program was categorized as a 'prevention' strategy if the study population had no described pre-existing ACEs before the intervention. A 'mitigation' strategy was specified if the target population had pre-existing ACEs when the intervention started (e.g., parents with a history of ACEs, mothers experiencing IPV). In public health, preventing ACEs may often occur through two-generational programs (e.g., targeting mothers and babies). Primary prevention of ACEs for the infant (e.g., preventing abuse/neglect) and secondary prevention (e.g., prevent recurrence of abuse/neglect). While also supporting mothers/caregivers to understand how their own history of ACEs impacts their health, behaviours and parenting practices.

The search focused on ACEs as an entity, as well as any independent ACE as exposures or outcomes. Search terms included 'adverse childhood experiences' as a key phrase, as well as 'child emotional, physical or sexual abuse,' 'parent drug abuse or addiction or history of misuse or use,' 'parent mental disorders,' 'domestic violence,' 'community health, health promotion or prevention' and Canada (all provinces and territories) (see Appendix). We included primary studies of any design, including qualitative studies that tested or evaluated a program focused on at least one of the 10 ACEs. Two reviewers (SC and TO) screened titles and abstracts for eligibility and then reviewed full-text articles to further assess relevance. Any discrepancies were resolved by discussion until consensus was achieved between the two reviewers. Hand searches of reference lists were also conducted to identify additional relevant full-text papers. We excluded studies that were conducted outside of Canada, any studies which were review-level, those based on specialized populations (e.g., people experiencing homelessness or incarceration) and those focused on clinical populations (e.g., diagnosed schizophrenia or behavioural problems). Data extraction was shared by two reviewers (SC and TO) and input into a single table. For each study, the study location, study design, type of ACE(s), population, setting (e.g., home, school, community or healthcare), intervention name, follow-up period, outcomes, key findings, authors' reported conclusion and limitations were extracted. Research question and key terms were informed by the ACEs Collaborative Working Group to meet the needs of the field. Multiple drafts of this document were reviewed by external experts.

Quality Appraisal

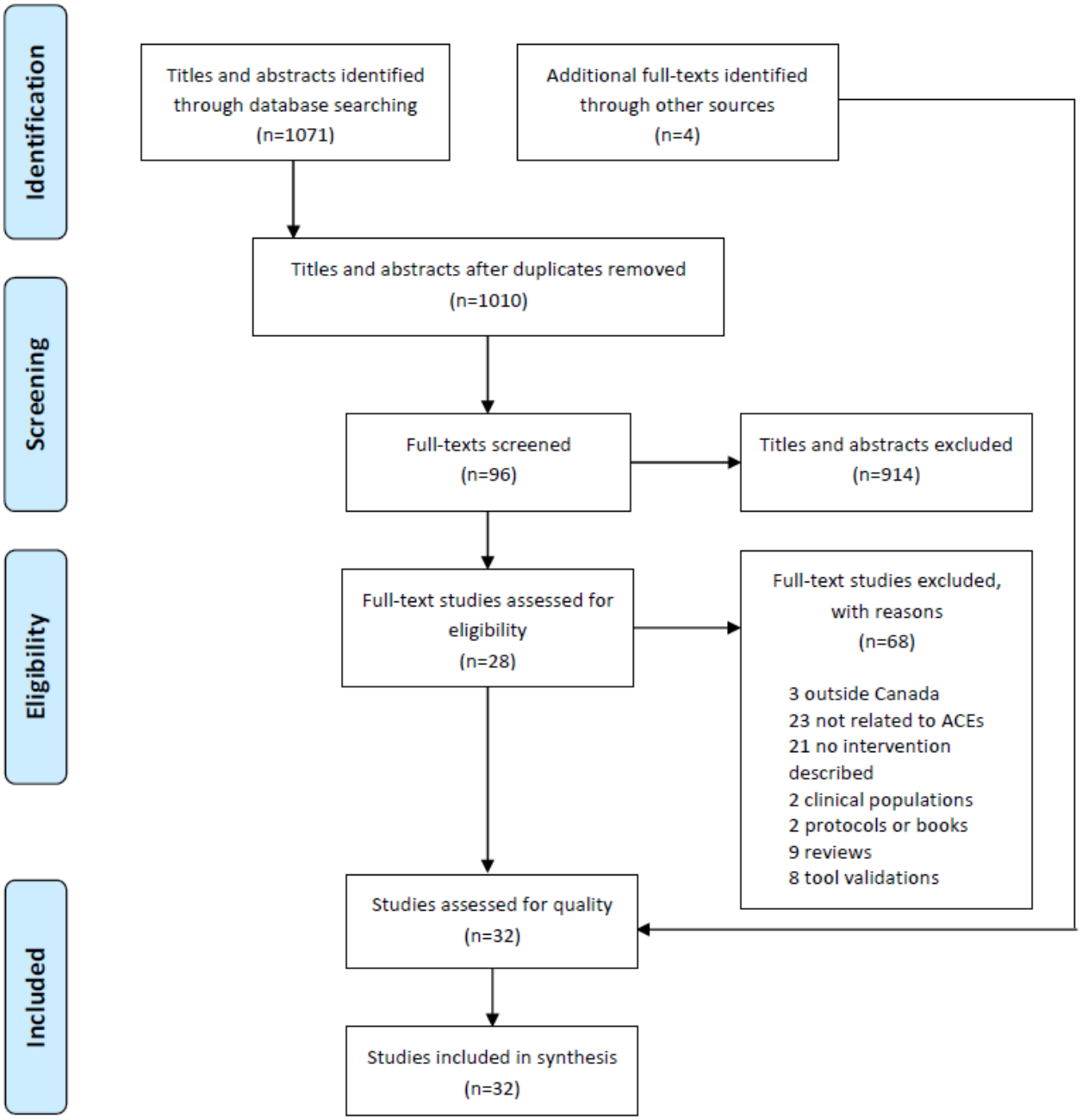
Two independent reviewers (SC and TO) assessed the quality of all included full-text articles using criteria and checklists appropriate for each study design. We used the Effective Public Health Practice Project (EPHPP) for Randomized Control Trials (RCTs);[20] Critical Appraisal Skills Programme (CASP) for qualitative studies;[21] Newcastle-Ottawa Scale (NOS) for cross-sectional, case-control and cohort studies[22] and a quality assessment tool for pre-post intervention designs.[23] Any differences in appraisal scores were discussed and decisions on the final score were made by consensus. Scores were categorized into three levels: weak, moderate or strong quality. We included all studies, including ones rated weak. Inherent limitations of the quality appraisal tool for pre-post studies systematically rated community program evaluations as weak. These studies are presented in this document because they may be important in a public health context.

Main Findings

A total of 1,071 abstracts were identified from the library search. Full-text screening occurred on 96 articles and a further four articles that were retrieved from reference lists. Thirty-two articles were relevant and assessed for quality (Figure 1). Most of these studies (N=17) were moderate in quality and nine studies were identified as strong. The remaining studies (N=6) were identified as weak quality. There were 26 different programs from six provinces described in the 32 included publications: nine (35%) in Ontario, four (15%) in Québec, four (15%) in Alberta, two (8%) in British Columbia (BC) and one (4%) program each from Manitoba and Saskatchewan. One program was conducted in an unnamed Western province[24] and four programs reported participants from multiple Canadian provinces.[25-28] A mix of urban, suburban and rural settings was represented. One program in Alberta was conducted with an Indigenous population on reserve[29,30] and two programs had Indigenous participants off reserve.[24]

The main study designs were RCTs and quasi-experimental; weak quality studies were all of a pre-post design. ACEs that were targeted were substance use (27%), abuse or neglect (27%), intimate partner violence (23%), mental illness in the household (12%) and multiple ACEs (12%) (Table 1). Where appropriate, effect sizes, confidence intervals and p-values are reported to demonstrate magnitude and statistical significance of the intervention. For a full description of each study's characteristics, see the Technical Appendix. In the results section, the studies have been reported by setting type (i.e., home-based, school-based, community-based and clinical/healthcare-based) to align with common public health settings and by ACE targeted, where possible. Due to the heterogeneity of study type, setting and ACEs identified by this review, synthesis was limited while also maintaining adequate detail of the intervention and study findings. In the discussion section, the findings are organized according to the four intervention approaches identified in the Wales Report.

Figure 1. Study Selection



Home-Based Interventions

ABUSE AND NEGLECT

Three home-visiting programs from five studies were identified in the peer-reviewed literature. Home-visiting programs include components to prevent child abuse and neglect and overall showed positive effects. **Families First Home Visiting (FFHV)** is a blended public health nurse and home visitor program in Manitoba.[31,32] The **Period of PURPLE Crying (PURPLE)** is an education program designed to increase knowledge about normal infant crying and prevent abusive head trauma.[33] The **Nurse-Family Partnership® (NFP)** program is a home-visiting program delivered by public health nurses in British Columbia and Ontario;[34,35] detailed descriptions of NFP can be found elsewhere.[36,37]

To evaluate FFHV, a retrospective cohort study showed that children who were enrolled in FFHV were 19% to 25% less likely to be taken into care in the first three years of life [adjusted risk ratio (aRR) 0.75 95% CI 0.66-0.86 after one year; aRR 0.79 (95% CI 0.70-0.88) after two years; aRR 0.81 (95% CI 0.73-0.91) after three years].[32] As well, children in the program were 41% (aRR 0.59, 95% CI 0.35-0.99) less likely to be hospitalized for a maltreatment-related injury, although the authors could not rule out the possibility of unmeasured confounders biasing this result.[32] Overall, the two studies assessing this home-visiting intervention found it to be effective at improving child outcomes for at-risk families.[31,32]

Barr et al. (2016) evaluated the PURPLE program in a randomized controlled trial of 1,279 mothers in British Columbia during a home visit by a nurse within two weeks after the birth of their child.[33] Results showed mothers who received PURPLE education materials had 5% (95% CI 4.1-6.5) greater knowledge about infant crying and 1.7 times (95% CI 1.1-2.6) more walk-away behaviour during inconsolable crying compared to mothers that received control materials.[33] There was also a significantly higher percentage of mothers in the intervention group who shared information about walking away if frustrated more often (13% difference), the dangers of shaking (13% difference) and infant crying (8% difference) compared to mothers in the control group.[33]

The NFP program is an international evidence-based nurse home-visiting program for young pregnant women or first-time mothers experiencing social and economic disadvantage.[36] The NFP is currently being implemented in Canada by public health in two provinces: BC and Ontario. As the research is still ongoing, we are unable to report on the effectiveness of the NFP in Canada at this time; preliminary trial results are expected in 2020. The developers of NFP in Denver, Colorado require all international sites rigorously evaluate NFP using a randomized trial design (which is currently ongoing in BC) prior to scale-up and implementation.[35] In preparation for the RCT, researchers in Canada conducted a study to identify program adaptations for the local context[35] and conducted a pilot study in Hamilton, Ontario to assess the feasibility and acceptability of the program.[34] Results showed NFP can be implemented in Canada with fidelity to 16 of the 18 original core model elements of the program. Given the evidence of effectiveness of this program established through three RCTS conducted in the United States,[38-40] as well as a positive evaluation in the Netherlands,[41] we have included the NFP, as it may be an important future direction to enhance home-visiting programs in Canada.

School-Based Interventions

There were six school-based programs from seven studies focused on the prevention of ACE-related outcomes. These ACE-related outcomes included emotional, physical, sexual abuse;[42] intimate partner violence (IPV);[43] mental illness in the household[44-46] and substance use in the household.[29,30] These programs were delivered separately or integrated into the school curriculum.

EMOTIONAL, PHYSICAL AND SEXUAL ABUSE

The **ESPACE Workshop**, offered by the Montreal Assault Prevention Centre (MAPC), is a French adaptation of the Child Assault Prevention (CAP) workshop for children in grades one to four.[42] Children were invited to participate in role-playing exercises based on three different situations, including bullying by peers, a potentially abusive situation by a stranger and an inappropriate sexual request by a known adult.[42] The primary outcomes were knowledge of inappropriate touching, child's ability to recommend appropriate behavioural responses to an abusive situation and victimization by peers. There were no significant differences between the experiment and control groups at a one year follow-up.[42] Children in the experimental group had greater knowledge of inappropriate touching ($F(1,81)=7.32$, p=0.008) and were less often victimized by peers ($F(1,81)=11.46$, p=0.001) compared to control at two years follow-up. A brief booster session was also shown to have a significant impact on knowledge of inappropriate touching (p=0.011); however, not on the other outcomes.[42]

INTIMATE PARTNER VIOLENCE (IPV)

An evaluation of a school-based intervention, **Fourth R**, to prevent physical dating violence (PDV) was conducted by Wolfe and colleagues in southwestern Ontario by incorporating a previously-validated curriculum into the health and physical education school curriculum.[47] In this cluster RCT, reported PDV was higher in the control schools compared to interventions schools (OR 2.42, 95% CI 1.00-6.02; p=0.05); however, in a smaller subgroup analysis of those adolescents reporting dating in the previous year, the results were non-significant (OR 2.14, 95% CI 0.81-5.66, p=0.12). There was a significant sex and intervention interaction effect (p=0.002); boys in the intervention schools were less likely to engage in dating violence than boys in the control schools (2.7% vs 7.1%, adjusted OR, 2.77, 95% CI 1.39-5.29). Results were similar when the analysis was restricted to boys who had reported dating in the last 12 months (OR 2.63, 95% CI 1.22-5.56). Conversely, girls had similar rates of all outcomes in both intervention and control schools.

MENTAL HEALTH

Adolescents Coping with Stress, Pare-Chocs and the **FRIENDS Program** were all school-based programs that used cognitive behavioural therapy (CBT) concepts to prevent or decrease the probability of developing mood disorders later in life.[44] The Adolescents Coping with Stress and Pare-Chocs programs were both targeted to adolescents, 14 to 17 years of age (grades nine to 12), identified at risk for depressive symptoms on the Center for Epidemiological Studies Depression Scale (CES-D).[44] In a randomized trial of **Adolescents Coping with Stress**, there were no significant differences on any outcome measures at three month-intervals post-intervention.[44] In **Pare-Chocs**, the experimental group had significantly fewer dysfunctional attitudes that revealed cognitive distortions associated with

achievement, dependence and self-control at post-test and follow-up compared to the control group ($F(2.86)=6.19$, $p<0.01$).[45] St. Onge and colleagues evaluated the 10-week **FRIENDS Program**, which focuses on children in grades one, four and six in Regina, using a pre-/post-test design without a comparison group.[46] There was a significant effect of the program on anxiety scores ($F(1,268)=15.44$, $p<0.001$) and depression ($t(293)=6.97$, $p<0.001$) with a decrease of 18% and 19%, respectively ($p<0.001$). The proportion of children reporting clinical and subclinical anxiety and depression also decreased at the completion of the program ($p<0.01$).[46]

SUBSTANCE USE

The **Life Skills Training (LST)** program is an evidence-based, school-based drug and alcohol prevention program to reduce substance abuse among young people.[48] This program was adapted for the Indigenous context and delivered in central Alberta on the Alexis Bajita Sioux Nation reserve. A certified LST trainer provided training designed to inform community members of the content of the program and to prepare community partners to deliver the curriculum with content and process fidelity. It involved eight weeks of two-hour lessons incorporated into the school curriculum. Adaptations to the program included translation (and back-translation) into Isga language, a cultural activity/ceremony added to every module, a Naming Ceremony and a community artist hired to create culturally appropriate images to replace those in the original program. In the qualitative analysis, community members described program adaptations made the program more sustainable and satisfying and felt they were fulfilling a personal commitment to preserve the Isga culture. There was also a benefit for Elders to connect more with youth in the community. Some challenges of the program included timelines for completing the work, work overload and complexity of the translation.[29] Initial quantitative analyses in the elementary school program showed 55% of students increased overall knowledge, 55% for drug knowledge, 64% for life skills knowledge, 46% for drug attitudes and 73% for life skills summary post-intervention.[29] There were no differences on the LST questionnaire items between control and intervention groups in the elementary school program after three years. In the junior high program, there were improvements in knowledge of the negative effects of alcohol use and more knowledge/decreased behaviour, in terms of drug use or intent in the intervention versus control group. A major limitation of this study was the difficulty implementing the program and completing follow up due to inconsistent and unpredictable school attendance.[30] Despite this, the LST program showed improvements on some evaluation indicators and has the demonstrated ability to be adapted to an Indigenous population.

Community-Based Interventions

There were 13 community-based interventions from 16 studies that were identified from the literature. Of these studies, eight focused on the mitigation of ACEs and were predominantly implemented by community partners, such as child protection services (CPS) rather than public health units. Two studies evaluated the effectiveness of a social marketing campaign to promote the **Triple P** (Positive Parenting Program) in two communities in Québec.[49,50] Although these studies did not report on any health outcomes, 32.1% of respondents recalled seeing the posters two years after a public awareness campaign to promote Triple P.[50] Mitigation and prevention interventions had highly vulnerable target

populations, such as families investigated for child maltreatment,[25-27,51,52] women who experienced IPV[24,53-55] and parents with substance use.[56-60]

ABUSE AND NEGLECT

One study conducted in Montreal, Québec examined whether the type of abuse (physical abuse alone, neglect alone, emotional maltreatment alone or any combination of the three), experienced by children moderated the effects of the **Incredible Years (IY)** parent training program.[52] Children with an active file in the Montreal CPS agency, whose parents attended at least one IY group class, were matched using propensity scores to control children with active files over the same time period, but whose parents did not attend IY.[52] The main outcome was the probability the child's case would be closed at the end of the study period. Overall, the probability the child's case would be closed increased by 39% for those families who attended the IY program compared to the comparison group (hazard ratio (HR) 1.39, $p<0.01$).[52] While there were beneficial effects of the program among all types of abuse and neglect, the effect of the program was greater for children who experienced neglect than for those who had experienced emotional maltreatment (HR 0.46, $p<0.05$).[52]

Another program evaluated the effectiveness of a **"Wraparound" model**, a form of care coordination, for the Children's Aid Societies (CAS).[51] This RCT targeted families who had a substantiated investigation for child maltreatment and randomized them to receive the wraparound model versus the standard CAS care.[51] Children involved in the trials had a mean age of 6.45 years and the mean age of mothers was 32.22 years of age. All families enrolled in the study significantly improved in study outcomes, including caregiver psychological distress, family resources and child impairments, regardless of treatment group; there were no significant effects attributable to the intervention (e.g., child impairments, d=0.14 [-0.12-0.52]).[51] Fidelity to the treatment program, measured using a "wraparound fidelity index" was low; only two (out of 10) components of the model were assessed as above average or high for implementation.[51]

The **Positive Discipline in Everyday Parenting (PDEP)** program is a primary prevention program to reduce physical punishment of children.[26] Results showed the program had a moderate effect (Cohen's d=-0.45) on decreasing the approval of physical punishment (particularly spanking); had a moderate effect (d=0.72) on subjective norms (e.g., less agreement with children's bad behaviour associated with defiance, disrespect, rudeness and spoiling) and increased self-efficacy (e.g., more parents believed that they could solve most of their parenting challenges after the program).[26] Overall, the majority of parents believed that parents should not use physical punishment and that the PDEP program helped them to use less physical punishment.[26]

The **Families and Schools Together (FAST)** program and **Right from the Start (RFTS)**[25] targeted adolescent mothers. The **FAST** program is a community-based, group work prevention intervention that showed significantly increased general self-efficacy and social self-efficacy ($p<0.01$), improved perceived relationship with their babies ($p<0.05$) and significantly decreased total parenting stress ($p<0.01$).[27] Overall, the teenage mothers reported favourable feedback of the program, such as their babies enjoyed interacting with other children, meeting new people, quality time and activities (e.g., making crafts, singing, dancing and massaging).[27] The **RFTS** program is an attachment-focused parenting course, where the primary goals are to enhance maternal sensitivity and infant attachment security by teaching

specific parental skills.[25] Results showed a statistically significant increase in overall parental sensitivity from pre-test to post-test ($t(4)=-5.8$, p=0.048), but no change in other outcomes, such as postnatal depression, parenting stress and parenting confidence after the program.[25]

INTIMATE PARTNER VIOLENCE (IPV)

Varcoe and colleagues (2010) conducted a mixed-methods process and outcome evaluation of the **Reclaiming Our Spirits** program, an adaptation of the Intervention for Health Enhancement After Leaving (iHEAL) program.[24] The **Reclaiming Our Spirits** program enrolled 152 Indigenous women aged 18-66 who had experienced IPV in their lifetimes.[24] Women in the program had statistically significant (p<0.001) improvements in quality of life, trauma symptoms, depressive symptoms, social support and mastery or perceptions of personal control immediately post-intervention and at six months follow up.[24]

Two studies from Graham-Bermann and colleagues examined two programs in a population of mother and preschool-aged children dyads.[53,54] The **Mom's Empowerment** program was aimed at mothers experiencing IPV to reduce post-traumatic stress symptoms.[54] The trial showed moderate improvement in decreasing symptoms; however, this finding was dependent on the mothers' age and the number of sessions attended.[54] The companion program for preschool-aged children exposed to IPV is called **Preschool Kids Club (PKC)**.[53] The PKC intervention showed partial effectiveness. In the intention-to-treat analysis, girls had a statistically significant (p<0.01) decrease in internalizing symptoms, but no effect was seen for boys;[53] however, in the per-protocol analysis, there was a moderate decrease in internalizing symptoms for both girls and boys.[53]

Tutty, Babins-Wagner and Rothery (2017) compared two therapy programs for IPV, **You're Not Alone (YNA)** for women experiencing abuse from their partners and **Responsible Choices for Women (RCW)** for women who have abused their partners.[55] The YNA program focuses on safety, self-care and healthy choices, while RCW focuses on taking responsibility for one's behavior, using tools such as responsibility logs and timeouts, addressing shame and perspective-taking with respect to their partners.[55] The authors evaluated the programs in a pre-post design among 262 women, 157 RCW members and 105 YNA members in Calgary, Alberta. Demographic differences between the groups included average length of relationship, RCW groups 6.2 years and YNA groups 11.4 years, more YNA women were separated/divorced from partners and more visible minority backgrounds among YNA women compared to RCW.[55] Results for both programs showed significant improvements in general distress, depression, clinical stress and self-esteem; however, the YNA group had a greater magnitude of change in these outcomes compared to the RCW group.[55]

SUBSTANCE USE

Two studies were included that evaluated **Breaking the Cycle**, a relationship-focused intervention (RFI) for mothers with a history of substance use in Toronto compared to standard integrated therapy (STI).[56,57] In these studies, 200 women consented and 91 completed data at follow-up after one year. Addiction severity significantly decreased for both groups. In a subgroup analysis of women reporting low self-efficacy, 80.6% were classified as having high self-efficacy compared to 50.0% of women receiving the STI ($\chi^2 = 4.04$, p=0.04) after one year receiving the RFI. Women in the RFI group also had

lower depression scores and moved into a nonclinical range of depression compared to their STI counterparts. Finally, there was a statistically significant increase in perceived support from friends and family and attachment security in the RFI group, but not the STI group.

Niiwin Wendaanimak Four Winds is a program to support Indigenous populations living in an urban centre who use substances and experience homelessness (Firestone, 2019).[58] This program is run out of the Parkdale Community Health Centre in Toronto, Ontario and supported inclusivity, a non-judgemental atmosphere and harm reduction practices.[58] The researchers applied a critical decolonizing lens to conduct a thematic analysis of the qualitative interview data.[58] Major themes that emerged included [feeling at] home, harm reduction policy, harm reduction and Indigenous culture, cultural safety and healing and wellness.[58] Participants described a feeling of home and experienced cultural safety through the Niiwin Wendaanimak program by having dedicated Indigenous-only time and space.[58]

The **First Steps** program aims to prevent future alcohol and drug exposed births among high-risk mothers who have already delivered at least one exposed child.[59] Rasmussen et al. (2012) evaluated the program in a pre-post design among 201 high-risk pregnant mothers in Edmonton, Alberta.[59] Results showed a significant decrease in overall needs in areas such as financial issues and community resources, significant increase in regular use of a family planning method (e.g., parenting, self-reliance, and community connection) and higher levels of abstinence from alcohol and/or drugs.[59]

The **Renascent Children's** program is targeted to the needs of children aged seven to 13 who have been affected by parental substance use.[60] The goals of the program are to create a safe environment for children to learn about addiction and how it impacts their family, help foster coping skills and increase emotional and psychological well-being through peer-support.[60] Usher and McShane (2016) evaluated the program in a pre-post design among 19 families (included 26 adults and 26 children) in Toronto, Ontario.[60] Results showed a significant decrease in emotional problems, conduct problems and depressive symptoms among the children after the program.[60] For the parents, there was a significant decrease in authoritarian parenting and improvements in emotion regulation after the program. There were also increases in family communication, cohesion and flexibility.[60]

Clinical/Healthcare-Based Interventions

There were three programs from three studies that implemented an ACE-related intervention in a clinical or healthcare setting, including primary care, hospital, outpatient clinic, etc. Two of the programs were prevention interventions focused on IPV in the general population[61,62] and one was on substance use.[63]

INTIMATE PARTNER VIOLENCE (IPV)

The first IPV program was a high-quality multicentre randomized controlled trial of **screening for IPV**.[61] The primary outcomes were recurrence of IPV at follow-up (six-month intervals) and a measure of quality of life. Secondary outcomes included depression, post-traumatic stress disorder (PTSD), women's alcohol and drug dependence and a global measure of mental and physical well-being. There was also a

measure of the intended harms of screening. There were no reported significant differences in IPV recurrence between the two groups on the primary outcome of recurrence of IPV at follow-up (six-month intervals).[61] Women in the screening group did report significantly higher quality of life scores and had fewer depressive symptoms at 18 months post intervention;[61] however, neither of these findings were found to be significant after additional analyses to account for the high attrition rate (43%). There was no indication of harm for either group.[61]

The second study to assess a prevention intervention for IPV was a small pre-/post-study that examined the effects of an **informational poster on IPV** to improve perceptions and willingness to discuss IPV in a hospital fracture clinic.[62] There were no significant differences between control and intervention groups on these outcomes.[62] The only significant difference was women (as compared to men) were more likely to believe IPV affects many people in Canada.[62]

SUBSTANCE USE

Ordean et al., (2011) evaluated the **Toronto Centre for Substance Use in Pregnancy (T-CUP)** program at St. Joseph's Hospital in Toronto, Ontario.[63] The authors assessed changes in prenatal care, social outcomes, such as housing and changes in the drug use of pregnant patients from first visit to delivery. Unfortunately, this study did not have a control group, so the relative effectiveness of the program cannot be examined.[63] Women in the program attended 88.3% of booked prenatal visits. At delivery, more women were in stable housing and fewer had no fixed address.[63] Out of 121 patients, 39 commenced a formal treatment program and 26 completed it.[63]

Online Interventions

SUBSTANCE USE

One program from one study used an online platform to conduct a preventive intervention for substance use.[28] Schwinn and colleagues randomized 14-year-old girls in 42 states and four Canadian provinces (unnamed) to receive a computer-based intervention called **RealTeen**.[28] The primary outcome was substance use, measured by the Centers for Disease Control Youth Risk Behavior Survey.[28] The researchers also measured mediating variables, such as normative beliefs, decision-making skills, stress management, refusal skills and self-efficacy.[28] No significant effects were seen at post-test; however, girls in the intervention group reported less substance use, specifically lower 30-day rates of alcohol use, marijuana use and poly drug use compared to the control group (all $p<0.05$) at six-month follow up. The intervention group also reported higher self-efficacy compared to controls.[28]

Table 1. Characteristics of included studies

Author, Year	Study Location	ACEs	Prevention/ Mitigation Strategy	Population	Setting (e.g., community, school, home, clinic etc.)	Intervention Name	Quality
Jack 2012, 2015	Hamilton, Ontario	Abuse and neglect	Prevention	At-risk pregnant people	Home	The Nurse-Family Partnership (NFP)	Moderate
Chartier 2017, 2017	Manitoba	Abuse and neglect	Prevention	At-risk parents/caregivers	Home	Families First Home Visiting program	Strong
Barr 2009	Vancouver, British Columbia	Abuse and neglect	Prevention	Mothers who just gave birth	Home	Period of PURPLE Crying (PURPLE)	Strong
Daigneault 2012	Montréal, Québec	Abuse and neglect	Prevention	General population - children	School-based	ESPACE (Québec adaptation of the Child Assault Prevention (CAP) Project	Moderate
Wolfe 2009	Southwestern Ontario	Intimate partner violence	Prevention	General population - adolescents	School-based	Fourth R	Strong
St. Onge 2016	Regina, Saskatchewan	Parental mental illness	Prevention	General population - children	School-based	FRIENDS program	Moderate
Poirier	Québec City,	Parental mental	Prevention	At-risk adolescents	School-based	Pare-Chocs	Moderate

Author, Year	Study Location	ACEs	Prevention/ Mitigation Strategy	Population	Setting (e.g., community, school, home, clinic etc.)	Intervention Name	Quality
2013	Québec	illness					
Dobson 2010	Calgary, Alberta	Parental mental illness	Prevention	At-risk adolescents	School-based	Adolescent Coping with Stress course	Moderate
Baydala 2009, 2014	Alexis Bajita Sioux Nation, central Alberta	Substance use	Prevention	Indigenous youth	School-based	Adapted Life Skills Training (LST) program	Strong
Sicotte 2018	Montreal, Québec	Abuse and neglect	Mitigation	At-risk parents/caregivers - CAS	Community	Incredible Years program (a parent training program)	Strong
Graham-Bermann 2015, 2018	Windsor, Ontario	Intimate partner violence	Mitigation	Children and women with experienced IPV	Community	Kids' Club program [Pre Kids' Club (PKC)] and The Moms' Empowerment Program (MEP)	Moderate
Varcoe 2019	Western Canadian province	Intimate partner violence	Mitigation	Indigenous women with experienced IPV	Community	Reclaiming Our Spirits (ROS)	Moderate
Browne 2016	Southern Ontario	Multiple ACEs	Mitigation	At-risk parents/caregivers - CAS	Community	Wraparound model	Moderate

Author, Year	Study Location	ACEs	Prevention/ Mitigation Strategy	Population	Setting (e.g., community, school, home, clinic etc.)	Intervention Name	Quality
Andrews 2018 Espinet 2016	Toronto, Ontario	Substance use	Mitigation	Pregnant or parenting women of children aged 0-six years using substances	Community	Breaking the Cycle (BTC)	Moderate
Firestone 2019	Toronto, Ontario	Substance use/housing	Mitigation	Indigenous adults and youth	Community	The Niiwin Wendaanimak Four Winds Wellness program	Moderate
Charest 2019 Gagne 2018	Québec City and Montréal, Québec	Abuse and neglect	Prevention	General population - parents	Community	Social marketing for Triple P	Strong
Bohr 2014	Canada	Multiple ACEs	Prevention	Adolescent mothers	Community	Right From The Start (RFTS)	Weak
Durrant 2014	14 cities in Canada	Physical abuse	Prevention	General population - parents	Community	Positive Discipline in Everyday Parenting (PDEP) program	Weak
McDonald 2009	11 Canadian communities	Multiple ACEs	Prevention	Adolescent mothers	Community	Families and Schools Together [FAST]	Weak
Rasmussen	Edmonton,	Substance	Prevention	High-risk pregnant	Community	First Steps program	Weak

Author, Year	Study Location	ACEs	Prevention/ Mitigation Strategy	Population	Setting (e.g., community, school, home, clinic etc.)	Intervention Name	Quality
2012	Alberta	use		mothers			
Tutty 2017	Calgary, Alberta	Intimate partner violence	Mitigation	General population - women	Community	You're Not Alone (YNA) and Responsible Choices for Women (RCW)	Weak
Usher 2016	Toronto, Ontario	Substance use	Mitigation	At-risk children – parents with substance use	Community	Renascent Children's program	Weak
MacMillan 2009	Multi-site, Ontario	Intimate partner violence	Prevention	General population - women	Clinical/ healthcare	Screening for IPV	Strong
Ordean 2011	Toronto, Ontario	Substance use	Mitigation	At-risk pregnant people	Clinical/ healthcare	The Toronto Centre for Substance Use in Pregnancy (T-CUP)	Moderate
Madden 2017	Hamilton, Ontario	Intimate partner violence	Prevention	General population	Clinical/ healthcare	IPV Informational Poster	Moderate
Schwinn 2010	Four Canadian provinces	Substance use	Prevention	General population - adolescent girls	Online	RealTeen	Moderate

Discussion

Public health has a role in the prevention and mitigation of ACEs as an essential service to support communities and improve population health.[64] The interventions to prevent or mitigate the impact of ACEs in this review included multiple approaches that could be led by public health or supported by public health partnerships with external stakeholders. To build on the international findings presented in the Wales report, we will discuss the findings according to four intervention approaches that describe the mechanisms to address ACEs: "supporting parenting, building relationships and resilience, early identification of adversity, and responding to trauma and specific ACEs."[14] The Technical Appendix of the Wales Report (2019) identified 23 programs that had been implemented in Canada; our literature search identified six of these programs (**NFP, Incredible Years, Triple P, screening for IPV, Life Skills Training, Families and Schools Together**).[14] This review identified an additional 20 programs that were not included in the Wales Report. Ultimately, it is likely that there are more programs that are being implemented in Canada that have not been captured by this review. Nonetheless, a wide array of programs to address ACEs were included. It is important to note many of these programs require partnerships with additional community agencies involved in children's services.

Supporting Parenting

Incredible Years and **Triple P** were the only parenting training programs in this review that were also included in the Wales Report. We found three strong quality studies evaluating the effectiveness of a public awareness campaign for Triple P[49,50] and Incredible Years for parents involved with CAS;[52] however, no studies that examined the effectiveness of parent training programs for a general population using a randomized design or any health or parenting outcomes were identified. Parenting programs have been shown to be effective, particularly for high-risk families and children with behavioural problems, in the United States[65,66] and Australia,[67] but these programs have not yet been evaluated in Canada.

The RCT of the **NFP** intervention in British Columbia is still being carried out; therefore, we were only able to include the preliminary studies on adaptation and feasibility, which showed positive results.[34,35] Most provinces in Canada offer either universal or targeted home-visiting programs led by public health nurses, family/home visitors or a blended model. During these home visits, there are opportunities for parenting support to be delivered to families; however, only the **Families First** program in Manitoba had peer-reviewed publications in the last 10 years that evaluated the program. Other programs have been evaluated in the grey literature, such as **Healthy Babies Healthy Children** in Ontario,[68] but were beyond the scope of this review.

Building Relationships and Resilience

The Wales Report described this category based on research that suggests that building and maintaining supportive relationships, self-efficacy skills and general resilience building[69] may help to moderate or mitigate negative effects of ACEs.[14] Although our review did not focus on interventions to 'build resilience' specifically, many of the school-based and community-based prevention interventions are

designed to foster these skills to prevent substance use and mental illness. Interventions, such as **Families and Schools Together (FAST)** and **Life Skills Training (LST)**, are programs that have shown some effectiveness in Canada[27] and internationally.[70] A strong quality RCT of a school-based physical dating violence intervention (**Fourth R**) was effective for boys two years post-intervention.[43] Three moderate quality studies of school-based programs in Saskatchewan, Alberta and Québec were also effective in reducing anxiety and depressive symptoms using **cognitive behavioural therapy (CBT)** concepts. [44-46] Overall, there were multiple effective school-based programs to reduce a variety of ACEs (substance use, mental illness, IPV) by incorporating the programs into school curriculum.

Early Identification of Adversity

Early identification of individual ACEs through screening, such as maternal mental health and IPV, has been proposed. We found a strong quality RCT demonstrating **screening for IPV** in a healthcare setting was not effective in reducing the recurrence of IPV in a general population.[61] We did not find any Canadian academic literature that examined the effectiveness of screening for mental health in pregnancy or in the post-natal period in a healthcare or public health setting, even though it has been recommended as best practice using a validated tool (Edinburgh Postnatal Depression Scale, EPDS). A review from the United States Preventive Services Task Force found "adequate evidence that programs combining depression screening with adequate support systems in place improve clinical outcomes (i.e., reduction or remission of depression symptoms) in adults, including pregnant and postpartum women."[71] Programs supporting pregnant and postpartum women with depression are likely important interventions for mitigating potential adversity for the parent-child relationship.

There is continued debate among experts about screening for ACEs.[72,73] There is no current standard of care for those who screen positive and little to no understanding of potential harms and costs of screening. A key ethical consideration in any public health screening program requires standard care pathways when there is a positive screen. As this review demonstrates, there are many options for interventions for a child or parent with ACEs; however, there is a lack of consensus regarding appropriate and accessible programs. There is also the potential for screening to re-traumatize clients or patients who have had adverse experiences;[72] however, there is an important argument for public health surveillance of ACEs, not as a diagnostic tool for individuals, but to provide health units the data to better understand their populations and communities.[73] In our review, we identified eight studies[74-81] that examined various tools related to ACEs, such as an Attitudes Related to Trauma-Informed Care (ARTIC) Scale;[74] however, due to the uncertainty in surveillance and screening of ACEs as an entity, we excluded them from this review. A future evidence synthesis could examine this question as more research is conducted.

Responding to Trauma and Specific ACEs

The fourth category of ACE intervention identified by the Wales Report was 'responding to trauma and specific ACEs.' In this review, most programs focusing on the mitigation of specific ACE-related harms were predominantly based in community and healthcare settings to provide clinical support to families that have experienced trauma. This included various interventions for child welfare services (Children's

Aid Societies, **Wraparound model**), community mental health and addictions treatment programs (**Breaking the Cycle**) and specialty clinics (**T-CUP**). Providing these professional groups with training on 'trauma-informed care' or raising awareness about ACEs in general may support a public health unit's initial approach to addressing ACEs in the community.[14]

The majority of the interventions identified by this review were aligned with preventing or mitigating a single ACE; however, previous studies have demonstrated that individuals are often exposed to multiple ACEs and their negative health consequences are more severe with an increasing number of ACEs.[5] As such, a public health approach to ACEs could involve a program of activities which address multiple ACEs, extends across multiple sectors (e.g., healthcare, welfare services, police and education) and takes into account intergenerational trauma.[82]

Indigenous Populations

Only three programs were identified that focused on Indigenous communities.[24,29,30,58] These studies were qualitative and mixed methods designs, often reporting process evaluation outcomes on the acceptability of the intervention adapted for Indigenous communities. The school-based on reserve prevention program (**LST**) was developed in response to substance use concerns in the community. Similarly, the IPV-specific intervention (**Reclaiming Our Spirits**) addressed a gap in services for Indigenous women who experienced IPV. The prevalence and experience of ACEs in Indigenous populations requires further knowledge to better understand how Indigenous people and communities experience adversity, trauma and intergenerational trauma related to ACEs.

Limitations

There were several limitations to this review. First, we excluded studies focusing on homelessness and tobacco use even though ACEs have been associated with both. While the prevention of homelessness and comprehensive tobacco control are public health issues, the literature on interventions in these areas was too vast to capture in this search. Second, we did not perform a grey literature search, which was beyond the capacity of our team due to the large scope of the research question. As such, program evaluations published as grey literature reports would have been missed. ACEs is not a well-indexed term and has a broad definition that encapsulates 10 different exposures, making it difficult to focus on ACE-based interventions. Therefore, we kept our definition broad enough to capture the 10 original ACEs described by Felliti et al., (1998)[1], but did not include other forms of adversity in childhood, such as poverty and food insecurity. We acknowledge that adversity in childhood can extend beyond the 10 ACEs used in our search strategy and interventions to prevent multiple forms of adversity in childhood are required, as public health practitioners and members of communities become more ACE-aware.

Strengths

Recognizing there are multiple international reports on preventing ACEs, our review included only Canadian primary studies to report on details most relevant to Canadian public health units, including effect sizes, populations targeted and program components. This allowed us to include a few studies that focused on Indigenous populations both on- and off-reserve. Our search strategy included multiple

databases and hand searches of reference lists to ensure completeness. We had two independent reviewers conduct a double relevance screen of 20% of the identified titles and abstracts and perform 100% double quality appraisal for all included papers. All discrepancies in quality scores were discussed until a consensus rating was achieved.

Next Steps

This review is an initial assessment of the types of interventions to address ACEs that have been implemented in Canada. We have also included a discussion of these studies under the four areas highlighted in the Wales Report. Although the main audience for this report are public health practitioners, many of the identified programs were implemented in settings outside of direct public health service delivery. This reflects evidence that a multi-sector, multi-component approach is likely most effective.[3,14,83,84] Nevertheless, the public health sector could support programming to prevent or mitigate ACE-related harms by collaborating and coordinating with these community services, raising awareness about the importance of ACEs and establishing ACE-aware policies within their own health units, such as trauma-informed care and reflective practice.

The concept of ACEs has expanded since the seminal study by Felitti and colleagues in 1998.[1] For example, there is now an *Adverse Community Experiences and Resiliency (ACE|R) Framework*[85] in the US, to address community violence. Multiple governments around the world are developing high-level policy initiatives and collective impact approaches to support communities to address ACEs, including California (California Department of Health, Center for Youth Wellness), Scotland (NHS Scotland) and Wales. In Canada, the Alberta Wellness Institute has developed the *Brain Story*; resources to raise awareness about the importance of early brain development and the effects of early adversity, including a free online 30-hour course.[86]

This literature review is part of an initiative by the ACEs Collaborative Working Group, which is composed of staff from PHO and four public health units. The second part of this initiative is an environmental scan of the current activities to address ACEs that are being planned or implemented in Ontario. The environmental scan report will follow the publication of this review. Together, it is the hope of the ACEs Collaborative Working Group that these documents provide the foundation for future planning and implementation of evidence-based programming to prevent and mitigate the impact of ACEs in Ontario and Canada.

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Appendix

Adverse Childhood Experiences

Requestor name: Sarah Carsley; Tiffany Oei

Request prepared by: Library Services

Contact information: library@oahpp.ca

Search Strategies

The primary search was created in Ovid MEDLINE and then adapted to other databases.

MEDLINE

Ovid MEDLINE(R) ALL <1946 to July 17, 2019>

#	Searches
1	adverse childhood experiences/ or (((childhood or "early life") adj3 (advers* or trauma*)) or ("adverse childhood" adj (experience? or event?))).ab,ti,kw. or (family adj3 (advers* or trauma)).ti,kw.
2	(((child or emotional* or physical* or sexual*) adj2 abus*) or ((emotional or physical) adj neglect*) or (child adj2 (maltreat* or mistreat*)) or "Domestic violence" or ((partner or spous* or wife) adj2 (abuse or assault* or batter* or beat* or violence)) or ((caregiver* or guardian* or father* or household or maternal or mother* or parent* or paternal or family) adj8 (((alcohol or drug* or polydrug* or substance*) adj3 (abuse or addiction or history or misuse or "use")) or imprison* or incarcerat* or jailed or "serving time" or divorce* or separated or separation or "marital dissolution")) or homeless* or ((insecure* or unsecure* or vulnerabl* or precarious* or unstabl*) adj2 hous*) or street-involved or ((caregiver* or guardian* or family or father* or household or maternal or mother* or parent* or paternal) adj8 ((mental* adj2 (disorder* or ill*)) or "mood disorder*"))).ab,ti,kw. not medline.st.
3	*Domestic Violence/ or exp *Child Abuse/ or *Spouse Abuse/ or *Intimate Partner Violence/ or *Physical Abuse/ or *Divorce/ or exp *Substance-Related Disorders/ or exp *Mental Disoders/
4	Family Relations/ or Family Conflict/ or Intergenerational Relations/ or Maternal Behavior/ or Maternal-Fetal Relations/ or Parent-Child Relations/ or Father-Child Relations/ or Mother-Child Relations/ or Parenting/ or Paternal Behavior/ or Grandparents/ or Parents/ or Fathers/ or Mothers/ or Single Parent/ or exp Child/ or Adolescent/ or exp Infant/

#	Searches
5	3 and 4
6	2 or 5
7	Community Medicine/ or Harm Reduction/ or Health Policy/ or Health Promotion/ or Preventive Health Services/ or Primary Prevention/ or Public Health/ or Public Health Nursing/ or Population Health/ or Public Health Practice/ or Risk Reduction Behavior/ or *Domestic Violence/pc or exp *Child Abuse/pc or *Spouse Abuse/pc or *Intimate Partner Violence/pc or *Physical Abuse/pc or (campaign or campaigns or diminish* or initiative* or interven* or lessen* or mitigat* or policies or policy or prevent* or program* or reduc* or strategy* or ((community or population or promot* or public) adj2 health)).ti,kw. or (((community or population or promot* or public) adj2 health).ab. and medline.st.)
8	exp canada/ or (canad* or "british columbia" or alberta or saskatchewan or manitoba or ontario or Québec or "new brunswick" or "nova scotia" or "prince edward island" or newfoundland or nunavut or "northwest territories" or yukon or whitehorse or yellowknife or iqaluit or victoria or vancouver or edmonton or calgary or "medicine hat" or saskatoon or regina or winnipeg or "thunder bay" or toronto or ottawa or hamilton or windsor or montreal or fredericton or moncton or halifax or "st. John's").ab,ti,kw.
9	(1 or (6 and 7)) and 8
10	limit 9 to last 10 years
11	limit 10 to (english or french)
12	remove duplicates from 11

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