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Assessment of Policies and Programs That Apply Adverse Childhood Experiences (ACE) Study Research

Authors	Tajik, Rohjan
Citation	Tajik, Rohjan. "Assessment of Policies and Programs That Apply Adverse Childhood Experiences (ACE) Study Research." Capstone, Georgia State University, 2018. https://doi.org/10.57709/12548398
DOI	https://doi.org/10.57709/12548398
Download date	2026-04-19 14:24:57
Link to Item	https://hdl.handle.net/20.500.14694/8723

**Assessment of Policies and Programs That Apply Adverse Childhood Experiences (ACE)
Study Research**

By

Rohjan Tajik

2018

ABSTRACT

Introduction: Adverse Childhood Experiences (ACE) are common among the population. Based on the reported data and studies, the prevalence of ACEs related health issues is significantly high throughout the U.S. While policies and programs exist to address ACEs, more information is needed to understand the number of states that have legislation and the specific initiatives that fall under the legislation.

Method: To preliminarily answer this question, several online search engines were utilized: Google, PubMed, ACEs Connection Website, ACE Too High, CDC Website, state health department website, and ASTHO. From these sources, documented state legislations on ACEs were identified using the search terms policies, programs, state legislation, ACEs, toxic stress, childhood trauma, and childhood adversity. Information was organized within Excel Spreadsheets by sector, initiative, for each state.

Result: Based on the CDC website, only 12 states and the District of Columbia utilized the Optional ACE module from 2009 to 2012. Throughout the US, only half of the states have ACE-related legislations within four main sectors identified as education, healthcare, child welfare and juvenile justice. The information on Puerto Rico and U.S. territories for ACEs legislation was not evident. Among the 24 states that have legislation to address ACEs, California and Vermont have 7 specific initiatives, Washington state has 6, Massachusetts has 5, and Oregon and Tennessee have 4. House and Senate Bills were identified for four states including Massachusetts, Tennessee, Virginia, and Washington state. Most legislation are associated with child welfare and education sectors. Juvenile justice sector had the greatest gaps.

Conclusion: From the present assessment it appears that there is a lack of data on the prevalence of ACEs among adults across states. Furthermore, most of the initiatives around ACEs are focused

on child welfare and education sectors. However, to have a strong impact on ACEs prevention, legislation should exist that cover multiple sectors. The role of monitoring the population through data collection is needed to inform policies set for the prevention and treatment of ACEs.

KEYWORDS: Trauma-informed care, ACEs, Legislation, Policy

Assessment of Policies and Programs That Apply Adverse Childhood Experiences (ACE)

Study Research

By

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MPH, Georgia State University

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**A Capstone Submitted to the Graduate Faculty
of Georgia State University in Partial Fulfillment
of the
Requirement for the Degree**

MASTER OF PUBLIC HEALTH

ATLANTA, GEORGIA

30303

APPROVAL PAGE

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ACKNOWLEDGMENTS

I would like to express my appreciation to my committee chair, Dr. Shanta Dube. Her patience, mentorship, and support helped me successfully completing this work and my academic journey. I also would like to thank my committee member Dr. Emily Graybill for her support.

I would like to express my gratitude to the Fulbright Program, Institute of International Education, and the School of Public Health at the Georgia State University for providing this amazing opportunity for me to complete my MPH program in the US. I would like to thank my IIE Advisor, Courtney Castillo, who has been patiently responding and following up with me on any situation I had. I am grateful for the Dean of the school, Dr. Michael Eriksen for his kindness and support. I am also thankful for my Academic Advisor at the School of Public Health, Gina Sample who has been always super responsive and supportive. I am thankful for my beautiful Fulbright fellows who became my family while being apart from home. The memories we made during this two years will last forever. I wish you all the best in your future endeavor wherever you are. I hope we can meet again someday.

Lastly, I would like to thank my family back home, my American and international friends for all the encouragement, support, and kindness in this wonderful academic and cultural exchanging journey. Your presence meant a lot to me and I am truly grateful for all you did for me.

Author's Statement Page

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Rohjan Tajik

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1 INTRODUCTION

1.1 Background

Adverse Childhood Experiences (ACEs) are defined as exposure to physical, emotional and sexual abuse; physical and emotional neglect; and violent or traumatic events experienced or witnessed during childhood (CDC, 2016). From 1995-1997, 17,000 adult health maintenance organization (HMO) members from Kaiser Permanente in San Diego, California took part in the study. The findings indicated that two-thirds of the study participants reported at least one form of ACE, and ACEs were associated with multiple social, behavioral, and health outcomes in adulthood (Felitti et al., 1998). ACEs can also influence future generations (Dube, Felitti, Dong, Giles, & Anda, 2003). The results from the ACE study have revealed that several childhood adversities including childhood sexual abuse (CSA) are common, interconnected, and related to several consequences including marital issues, substance abuse, mental disorders, psychotropic treatment, cardiovascular disease, and autonomic illnesses (Anda, Brown, Felitti, Dube, & Giles, 2008; Dube et al., 2003; Dube et al., 2001; Dube, Cook, & Edwards, 2010; Dube et al., 2009; Dube et al., 2003; Felitti et al., 1998). Moreover, based on the ACE study findings, 1 out of 6 men and 1 out of 5 women experienced sexual abuse, and its health impact throughout the lifespan was comparable among both sex (Dube et al., 2005).

1.2 The Prevalence of ACEs in the US

There is greater awareness that these forms of childhood trauma (ACEs) are widespread in the US and worldwide. Nearly 25% of children and adolescents in communities have been exposed to at least one traumatic experience in their lifespan (Ko et al., 2008). Results from a national survey (Habib, Labruna, & Newman, 2013) demonstrated that about 70% of children and adolescents

experienced at least one case of violence, and about 50% had been victimized for more than one case within a year. According to the Core Data Set of the National Child Traumatic Stress Network (NCTSN), the percentage of youth in residential care who witnessed or were exposed to several domestic or community ACEs is dramatically high. Therefore, traumatized children need support outside the home.

1.3 The Neurobiology of ACE

The biological plausibility of the contribution of early life adversities to multiple negative outcomes later in life has been documented in research. Studies demonstrate that exposure to abuse, neglect and household dysfunction can negatively influence brain development (De Bellis et al., 1999; Lehman, Taylor, Kiefe, & Seeman, 2005; Stein, Koverola, Hanna, Torchia, & McClarty, 1997; Teicher et al., 1997). The neural science revealed that the early experiences form the structure and function of the brain through the building of synaptic connection in the central nervous system (CNS). This developing process takes place within two phases of proliferation and pruning. Synaptic proliferation happens during the first three months after birth and are completed before the second year of life (Huttenlocher & Dabholkar, 1997; Petanjek et al., 2011). According to the studies on animals, decreased or increased in the environmental input during the development of a single modality such as vision correspondingly influences the number of synapses in the sensory cortex (Bennett, Rosenzweig, Diamond, Morimoto, & Hebert, 1974; Diamond et al., 1966; Diamond, Rosenzweig, Bennett, Lindner, & Lyon, 1972; Globus, Rosenzweig, Bennett, & Diamond, 1973). These findings indicate that exposure to chronic stress caused by ACEs influences brain development in early ages (Kalmakis & Chandler, 2015). The negative influence of ACEs on neurodevelopment in early ages can cause social, emotional, and cognitive impairment. As a consequence, ACEs can create health-risk behaviors in the victim,

leading to chronic diseases, disability, and social and behavioral problems (Ellington, 2017), and even early death in adulthood (CDC, 2016).

1.4 Trauma-Informed Care

Trauma-informed care framework developed by SAMHSA was informed by the ACE Study and has application in many settings (Center for Substance Abuse Treatment, 2014). In 2010, in a study on trauma-informed services for a group of homeless people, Hopper, Bassuk, & Olivet (2010), developed a definition for Trauma-Informed Care (TIC) as a framework to understand and respond to traumatic impact that results in physical, psychological, and emotional protection (Hopper, Bassuk, & Olivet, 2010). Schools are a primary setting where trauma-informed practices are implemented. Trauma-informed care programs and interventions are designed to train individuals such as teachers and school staff to detect the symptoms and help the students through consultation and providing mental health services (Center for Substance Abuse Treatment, 2014). Currently, Positive Behavioral Intervention and Supports and Social-Emotional Learning are implemented to create a positive climate in school for children not only to promote academic, but also social and emotional development (Cohen, McCabe, Michelli, & Pickeral, 2009). In a socially positive school climate, at-risk children feel safe and more comfortable interacting with peers and teachers (Keogh, 2000) and communicating their traumatic experiences and reach out for help. By implementing the trauma-informed system at school, trained teachers and staff will be there to respond effectively to such cases. *Restorative Practice Model* is another intervention in the education system to improve the social relationship among peers and teachers (Blood & Thorsborne, 2005). Blood and Thorsborne (2015) emphasize the role of informal conferencing and mediation to promote the healthy relationship among the *school community* to effectively deal with children engaging in harmful behaviors (Blood & Thorsborne, 2005).

1.5 The Need for ACE Informed Policies and Programs

The need for policies and legislation to support trauma-informed care and other efforts targeted towards preventing childhood adversities is also a current focal point. To prevent ACEs across the life-span, multiple systems need to be involved. In the literature, the importance of creating the trauma-informed systems within several child-serving settings including health, mental health, education, child welfare, first responder and juvenile justice has been investigated. Ko et al. (2015) indicated that the providers need to apply a trauma-informed approach in their practices to promote the care required for recovery for the children and adolescents exposed to trauma. A required part of the trauma-informed system is to make sure that the children and adolescents are screened for trauma exposure. Moreover, evidence-based practices should be available for providers, survivors, and family members. Recommendations were provided for practitioners to change the practices and policies to create trauma-informed systems as follows: 1. enhance the interaction of trauma-focused practices within common mental health care and other service-providing sectors; 2. determine the important changes in practices that result in desired outcomes from the view of providers and policymakers; 3. constantly evaluate the advantages of trauma-informed care implementation; 4. apply trauma-informed services in the education and training system for children and family-serving system; 5. provide trauma-informed care and trauma-focused interventions on time and purposefully; 6. reproduce specific evaluation, assessment, and therapy services provided by projects within National Child Traumatic Stress Network (NCTSN); 7. focus on interdisciplinary alliance and relationship-creation (Ko et al., 2008).

Given the extensive research documenting the long-term health impact of ACEs, public health experts are currently engaged in implementing interventions. These interventions can be applied at several stages of childhood. In the early life stage, several programs have been designed to

emphasize the importance of an appropriate communicative interaction with children. For example, Talk With Me Baby is a training program which is designed to help parents interact with infants to promote early literacy. This program promotes a constant communication between parents/adult caregivers and babies to facilitate language nutrition (Talk With Me Baby, n.d.). At later stages, government programs as the Child Welfare Systems and Juvenile Justice (Ko et al., 2008) are there to protect at-risk children (Child Welfare Information Gateway, n.d.). All these support systems should be increasingly trauma-informed to provide the appropriate care for traumatized children (Ko et al., 2008)

1.6 Purpose of the Present Study

There is still a lack of information with regards to what policies and programs are currently implemented to prevent ACEs. Therefore, it is important to review the current landscape with regards to interventions that are informed by the ACE Study. The focus of the present study is to review the current programs and policies on ACEs prevention and treatment and also the state-level legislation that address ACEs and what these legislation cover. It is also important to track what states have ACE-related legislation. Therefore, this project proposes the address the following questions:

- What current programs and policies exist to prevent ACEs /trauma/toxic stress?
- What are the existing legislation at the state level that are informed by the ACE Study?
- Which U.S. states have legislation?

2 LITERATURE REVIEW

2.1 The Original ACE Study Findings

From 1995 to 1997, the ACE Study documented the prevalence and contribution of three types of abuse (sexual, physical, and emotional), two forms of neglect (emotional and physical), and five types of household dysfunctions (growing up with parental separation or divorce, substance-abusing household members, violently treated mother or stepmother, mentally ill household member and incarceration) (Felitti et al., 1998). The ACE Study was landmark research to recognize the risk that early life adversities have on health decades later in life.

2.2 The Social Burden of ACEs

The ACEs related health outcomes in adulthood can be different, from psychological and behavioral problems to health-related issues among victims depending on the type of adversities. Ports et al. (2016) used the Data from the CDC-Kaiser ACE Study to demonstrate the significant relationship between *childhood sexual abuse (CSA)* and *sexual victimization (SV)* in adulthood. Not only CSA, but growing up in a home that any household member is treated violently, imprisoned, or suffered from mental illness, chronic depression, drug, and alcohol abuse increase the risk of adulthood SV (Ports, Ford, & Merrick, 2016). Another study shows the significant relationship between spanking during childhood as a risk factor for increased suicidal attempts years later (Afifi et al., 2017). Choi et al. (2017) revealed the higher risk for *mental and substance use disorders (MSUDs)* among those who have been exposed to adverse childhood events (Choi, DiNitto, Marti, & Choi, 2017). Other negative consequences would be lower academic performance, unable to properly interact with family members and peers, involvement in high-risk behaviors such as drug and alcohol abuse, poor social skills, unemployment, *personality disorders*, poor quality of life, *non-suicidal self-injury* and suicide attempts (Berent et al., 2017; Janusek,

Tell, Albuquerque, & Mathews, 2013; Ko et al., 2008; Rose et al., 2016; Vaughn, Salas-Wright, Underwood, & Gochez-Kerr, 2015).

All these negative social behaviors damage the health condition and productivity of the community. These high-risk social behaviors increase the rate of violence and crime in the communities with a high number of ACEs-affected residents, creating unsafe neighborhoods and safety issues (Brewer-Smyth, Cornelius, & Pickelsimer, 2015).

2.3 The Economic Burden of ACE

Childhood adversities include abuse, neglect, and related forms of household stressors (Dube et al., 2001; Felitti et al., 1998). Some children and adolescents might overcome the temporary trauma soon after experiencing it (Ko et al., 2008), however, researchers emphasize on a strong association between several chronic health and behavioral problems in adulthood related to childhood exposure to ACEs. These chronic problems are the main reason for the increased morbidity and mortality among victims (Brockie, Dana-Sacco, Wallen, Wilcox, & Campbell, 2015). Childhood adversities are responsible for a broad severe and chronic psychological and physical disorders in adulthood. Some of the main health problems associated with ACEs are identified as severe depression, overweight, obesity, type 2 diabetes, Post Traumatic Stress Disorder (PTSD), immune dysregulation, and various types of cancer (Brewer-Smyth, Cornelius, & Pohlig, 2016; Fagundes, Glaser, & Kiecolt-Glaser, 2013; Felitti et al., 1998; Janusek et al., 2013; Thomas, Hyppönen, & Power, 2008; Xie et al., 2010). Based on the high prevalence of ACEs among the population, the economic burden for treatment seems to be dramatically high (Fang et al., 2015; Hanson, Self-Brown, Rostad, & Jackson, 2016). However, there is a gap in the literature on the estimation of the economic burden related to ACEs in the US.

2.4 The Need for Policies and Programs Addressing ACEs/Trauma/Toxic Stress

Based on the findings regarding the prevalence and the outcome of ACEs, trauma-informed care, and resilience-building approaches are highly required in multiple settings from policies and legislations to public health programs and interventions in communities, health care services, child welfare, learning environments, criminal justice, and resiliency. Studies regarding policies, legislations, and programs addressing ACEs in the US states is missing in the literature. Therefore, we study these elements to see what ACEs-related work has been done at the state level in the United States.

The National Conference of State Legislatures (NCSL) did a scan through StateNet to identify bills introduced in 2017 that specifically address ACEs. NCSL identified more than 40 bills in 18 states (ACEs Connection, 2018b; ACEs Too High, 2018). However, the number of bills and states that established them were higher (ACEs Connection, 2018a).

2.5 Behavioral Risk Factor Surveillance System Optional ACE Module

Approximately ten years after the start of the CDC-Kaiser ACE Study, an optional module was developed and proposed for the Behavioral Risk Factor Surveillance System (BRFSS), which is the largest state-level surveillance system. According to CDC, the BRFSS offers an optional ACE module for states to implement when they undertake the annual data collection for BRFSS. Data is collected using a random digit dial telephone survey.

In 2010, CDC published a report to document prevalence estimates of ACEs across five states (Arkansas, Louisiana, New Mexico, Tennessee, and Washington) in 2009. Based on the data presented in this report, the prevalence of each category of ACE was comparable among states. However, some categories of ACEs were more prevalent in certain states. For example, the prevalence of sexual abuse was higher in Washington (13.5%) compared to the other four states

including Arkansas with 10.9%, Louisiana with 9.9%, New Mexico with 12.9%, and Tennessee with 12.7% of reported sexual abuse. Also, New Mexico has the highest rate of physical abuse (19%). This is the first report using the BRFSS data to show the prevalence of ACEs across five states. More studies like this will reveal the gaps for the policymakers to take action (*Morbidity and Mortality Weekly Report (MMWR)*, 2010).

2.5.1 Studies Based on BRFSS ACE Module

There are studies based on the BRFSS ACE module to investigate adulthood adverse health outcome associated with ACEs. BRFSS data is used to study the *salutogenic paradigm* among adults exposed to ACEs and *childhood sexual abuse (CSA)*. Studies emphasize the positive influence of physical activity and non-smoking behaviors to enhance the health condition among ACEs and CSA adult survivors (Dube & Rishi, 2017). While highlighting the positive impact of health-promoting behaviors, Dube et al. (2017) also emphasized the negative impact of toxic stress in childhood and the importance of preventing childhood adversities (Dube & Rishi, 2017).

Remigio et al. (2017) investigated the association between childhood adversity and smoking, overweight obesity and binge drinking among a group of Hawaiian women using the 2010 BRFSS survey in Hawaii. Results of the study demonstrated an increased prevalence of smoking and obesity according to the increase in the number of ACEs among the population, regardless of the race and ethnicity. However, a positive association was found between ACEs and obesity among Asians and NHOPIs. Moreover, results significantly show a relationship between sexual abuse and binge drinking only among Asians (Remigio-Baker, Hayes, & Reyes-Salvail, 2017).

Dube et al. (2010) investigated the prevalence of seven ACEs and the related health outcomes in adulthood in Texas using the 2002 state-added ACE questions. The findings of the study showed a significantly high prevalence of ACE-related outcomes among adults in Texas. Some of the

outcomes included the association between ACEs and low socioeconomic status, low education level, high unemployment status as well as smoking, obesity, and unemployment (Dube et al., 2010).

2.5.2 Case Studies Using the BRFSS ACE Module

Several case studies have documented the use of BRFSS ACE data at the state level to inform programs and policies. For example, in Oklahoma, the 2012 and 2014 BRFSS ACE module data were used to support the reorientation of attention from treatment to prevention. The data were used to make the case for creating state agency partnerships between child welfare, juvenile justice, and mental health sectors, with a focus on ACEs. (Case Study: Learning from Oklahoma's ACE Story - CDC, n.d.).

Washington state created a case study based on the use of BRFSS ACE data to estimate the population prevalence of childhood adversities in their population. Washington used the ACE module data to enhance the prevention of child maltreatment. Washington legislators benefited from the help of researchers and experts from several entities to train them and created partnerships to emphasize the negative outcome of childhood adversity. Having the stakeholders involved, Washington could identify every sector's role in data collection and usage and developed a collaboration among stakeholders to find effective interventions to prevent ACEs (CDC, n.d.). South Carolina has also used the BRFSS data for trauma-informed purposes.

2.6 The American Academy of Pediatrics (AAP)

Engagement of pediatric providers in the promotion of the social and emotional well-being of children in families and communities is critical. Pediatricians have the key role in the prevention of child abuse and neglect (AAP, n.d.). In 2012, the AAP published a policy statement on the effects of toxic stress and ACEs according to the *ecobiodevelopmental* framework to address this critical topic (A. Garner & Shonkoff, 2012; A. S. Garner et al., 2012). The *ecobiodevelopmental*

framework emphasizes that learning and behavior of the person are formed by the interconnection of personal experiences, environmental effects, and genetic structure throughout the lifespan. Based on this framework, AAP presents the following recommendations: raising awareness on disparities are defined by socioeconomic and behavioral factors, providing training for healthcare providers on the influences of toxic stress, continuing advocacy by pediatricians. Through the anticipatory guidance provided by medical home, the AAP emphasizes on the importance of screening for at-risk children, knowing the resources available in the community, detecting and establishing interventions to reduce causes of toxic stress, and proposing therapy plans to reduce the effects of toxic stress (A. Garner & Shonkoff, 2012; Shonkoff et al., 2012).

According to AAP, a community resource guide has been developed by the US Department of Health and Human Services' Children's Bureau, Office of Child Abuse and Neglect cooperated with its Child Welfare Information Gateway to enhance activities for child abuse prevention in the year. This *Prevention Resource Guide* is developed to help service providers in identifying ways to engage in child abuse prevention through working with families and communities. The guide highlights the protective factors that enable families to use their position in promoting *healthy child and youth development* (AAP, n.d.). When a case of child abuse and neglect is identified by the pediatric provider, it might be referred to other service providers for training or home visiting programs (AAP, 2018).

2.7 Healthy Families America (HFA)

Healthy Families America (HFA) is a national program by Prevent Child Abuse America to promote health development and the interaction between the provider and families by providing support, technical aid, and training. HFA national office is based in Chicago, Illinois. Their major contribution is in providing screening and surveys to identify at-risk children for child

maltreatment and ACEs in families, home visiting activities, and regular screening for child development and depression among mothers. Moreover, they have support group services for parents and programs designed for fathers. HFA emphasizes community engagement as a tool to provide support for families (Healthy Families America, 2018).

2.8 Center on the Developing Child – Harvard University

Harvard University's Center on The Child Development utilizes the science of early childhood as a source to develop effective policies and services to address the early ages of life. The center implements various evidence-based innovations to promote child health. Researchers, practitioners, and community members collaborate under the Frontiers of Innovation (FOI) network to generate ideas and develop capacity building programs for adults to influence child health. The strategy they follow is to reduce the stressors such as socioeconomic instability within the family (Center on The Developing Child Harvard University, n.d.-b). FOI implements several projects in different areas in the US as follows:

2.8.1 FIND

Filming Interactions to Nurture Development (FIND) is a program to promote positive interaction between the caregiver and children by video coaching. The recorded videos are carefully watched by the coach and the caregiver to bring into attention the small details on effective interaction for child development (Center on The Developing Child Harvard University, n.d.-a).

2.8.2 MOMS

Mental Health Outreach for Mothers (MOMS) is a partnership developing program designed to encourage positive communication among the neighborhood and community members. The aim of this project is to provide a support system in terms of mental health within the community for

single mothers in at-risk neighborhoods (Center on The Developing Child Harvard University, n.d.-e).

2.8.3 The International Mobility Project

The Intergenerational Mobility Project aims to decrease the influence of poverty and the stress caused by that through operating science on designing the social service program. This program supports lower-income families through economic promotion (Center on The Developing Child Harvard University, n.d.-c).

2.8.4 Ready4Routines

This program helps parents to deal with their children on daily basis situations such as *bedtime* and *mealtime*. Ready4Routines empower parents with skills to build a proper interaction with children while predicting their attitudes and routine behavior (Center on The Developing Child Harvard University, n.d.-f).

2.8.5 Learning Through Play

This program uses playing games as a mean to improve children's *executive function* skills. According to the Learning Through Play team, this intervention is a trauma-informed early education that assists individuals to use playing as a skill developing strategy in children (Center on The Developing Child Harvard University, n.d.-d).

2.8.6 Urban Thinkscape

This program reforms the neighborhood to a learning environment for children through innovative and mind challenging playing opportunities that are provided through the interaction between caregivers and children. Games can be established in various areas in the neighborhood such as bus stops, stores, playgrounds, etc. to engage children with learning tasks through playing games and solve puzzles. These plays urge children to use imagination and have physical activities, which

improve literacy and social-emotional skills (Center on The Developing Child Harvard University, n.d.-g).

There are a number of significant efforts to prevent ACEs through the implementation of programs to improve parent-children interaction within the families and communities. Additional understanding of macro-level ACE initiatives at the state level is currently needed.

3 METHODS

3.1 Terminology to Identify Legislation, Policies, and Practices Addressing ACEs

The CDC-Kaiser Adverse Childhood Experiences Study was groundbreaking research that first introduced the term ACEs and demonstrated the contribution of early life stress and trauma to health decades later (Felitti et al., 1998). Later on, more researchers used the term ACEs. The original ACE study addresses child maltreatment. However, several terminologies are being used in the literature addressing ACEs since the original ACE study. Dube (2017) utilizes a running list of terminology that has evolved from the original ACE Study that is relevant to understanding what policies and programs exist to prevent ACEs. Dube (2017) utilizes this information when talking about the ACE study curricula to educate individuals about the different terminology that now exist since the start of the ACE study (Dube, 2017).

Adverse childhood experiences and childhood adversity are the original terms used in the ACE Study. Childhood trauma is also used in the literature to address ACEs. Researchers emphasized on the importance of multiple elements at the individual, family, community and society level causing childhood trauma instead of a single reason of childhood maltreatment (Belsky, 1980; Dong et al., 2004). In a study, sexual abuse during childhood is studied as one of many traumatic experiences to investigate whether childhood trauma can be forgotten by victims in adulthood and if forgetting the traumatic experiences would influence the health consequences. According to the evidence of the study, forgetting the trauma is not evidence that the trauma did not happen (Williams, 1994).

Toxic stress is another term that has been used in literature to address ACEs. In the literature, toxic stress is defined as exposure to several stressors or extremely dangerous stressors including ACEs (Shonkoff et al., 2012). Shonkoff et al. (2012) also declared that constant exposure to toxic stress

at early ages can modify the genetic pattern, which influences the neurodevelopmental process leading to health issues in adulthood. Furthermore, toxic stress studies reveal a significant association between childhood adversity and negative mental, behavioral, educational, and social impacts. According to the pediatrics, several adulthood health issues are the result of toxic stress rooted in early adversities and social disparities that can be preventable. Therefore, pediatricians play a key role to establish evidence-based approaches to create a durable basis for academic success, socioeconomic enhancement, social responsibility, and lasting well-being (Shonkoff et al., 2012).

Based on the several terminologies that are being used for ACEs in the literature since the original ACE study in 1998, it seems to be important to define what ACEs exactly means. A clear definition makes a big difference when it comes to legislation and policies addressing ACEs. To avoid misunderstanding while addressing ACE it is required to choose a universal term for it.

3.2 Search Engines Utilized

Various resources were utilized to assess state bills and legislation specifically addressing ACEs. Each of the below resources included varying information on topics. Because most of the information was qualitative, specific themes and subjects were identified and included in an Excel Spreadsheet, which serves as the template for the database.

ACEs Connection: One main source used to identify legislation, policy, and programs were the ACEs Connection Network. Jane Stevens is a journalist and founded the ACEs Connection Network to provide the field with resources related to ACE research and practice. From this website, a full description of state legislation and community level initiatives related to ACEs was identified. Two main reports on ACE-related legislations at the state level were discovered. *At-A-Glance 2017 Proposed Legislation ACEs/Trauma-Informed Policy* was the most updated one from

2017. The older version found was called *At A Glance State Statutes and Resolutions ACEs/Trauma-Informed Policy*. The data from some states was missing in the updated 2017 report - *At-A-Glance 2017 Proposed Legislation ACEs/Trauma-Informed Policy* - while the bills were available online was a critical limitation.

PubMed: Utilized to identify peer-reviewed articles on policies and programs related to ACEs and trauma-informed care. Also, it is used to find studies using the BRFSS data.

Google Search Engine: Search terms utilized were mainly bills and legislations to address ACEs at the state level and also community-based programs and interventions. Google search engine was used to find ACEs related interventions and programs such as Talk With Me Baby, Harvard University's Center for the Developing Child, Healthy Families America, etc.

American Academy of Pediatrics (AAP) Website: The AAP policy statement on toxic stress and other initiatives was collected.

Centers for Disease Control and Prevention (CDC) Website: Utilized to identify the ACE study findings. CDC website was also used to find case studies using BRFSS data.

The Behavioral Risk Factor Surveillance System (BRFSS) ACE Module: Specific Case Studies published. The Behavioral Risk Factor Surveillance System (BRFSS) is an optional module for ACEs studies (CDC, 2018). BRFSS is a premier nation-wide surveillance system that collects health-related risk behaviors, chronic health conditions, and use of preventive services from US residents by telephone. BRFSS established in 1984 with only 15 states using it. However, BRFSS now collects data from all 50 states plus District of Columbia and three US territories.

ASTHO and ACE Too High: These sources were used to identify ACE-related legislations, policy, and programs at the state level.

3.2.1 Compiling the Information

A preliminary Excel data repository was created. This data repository includes initial but not exhaustive findings of specific language about the bills and/or legislation with the corresponding states. After reviewing the legislation language, a separate Excel data repository was created. The variables in the second data repository were created from the topic-specific legislation identified. Each state served as a unit. Settings and systems as well as the specific interventions were included as variables; this was conducted to understand the scope of legislation coverage for ACEs across each state. Two main reports on ACE-related legislations at the state level were discovered. *At-A-Glance 2017 Proposed Legislation ACEs/Trauma-Informed Policy* was the most updated one from 2017. The older version found was called *At A Glance State Statutes and Resolutions ACEs/Trauma-Informed Policy*. Some of the legislations from four states (Florida, Minnesota, Texas, and Wisconsin) was missing in the 2017 updated report compared to the older version. The data collected from both reports were then combined and used to create a table illustrating legislations by states.

3.3 Analysis

The analysis includes summaries of language in the legislation to identify sectors: education, healthcare, child welfare, and juvenile justice. Designations were then developed to include these four sectors and additionally specify the ACE initiatives. The information in the data repository is used to both qualitatively and quantitatively to describe what actions have been enacted at the state level.

4 RESULTS

4.1 States Utilizing ACE Optional Module

Using the optional ACEs module helps to inform the welfare programs in states through population-based surveillance. Based on CDC (2018), among 50 states, 12 states and the District of Columbia established the ACE module from 2009 to 2012; 75% of states have not yet implemented the ACE module since 2009. No state has implemented the ACE module since 2013 (Centers for Disease Control and Prevention (CDC). 2016) (*table 1*).

Table 1. States administered optional ACE module through 2009 to 2014

State	Established BRFSS Optional ACE Module							Total
	2009	2010	2011	2012	2013	2014	2015	
Arkansas	Yes							1
Hawaii		Yes						1
Iowa				Yes				1
Louisiana	Yes							1
Minnesota			Yes					1
Montana			Yes					1
Nevada		Yes						1
North Carolina				Yes				1
Tennessee				Yes				1
Vermont		Yes	Yes					2
Washington			Yes					1
Wisconsin		Yes	Yes	Yes				3
District of Columbia		Yes						1
Total	2	5	5	4	0	0	0	16

It should be noted that some states have ACE-added questions to the BRFSS (data not presented). Georgia is one of the states that added ACE questions to its BRFSS in 2016.

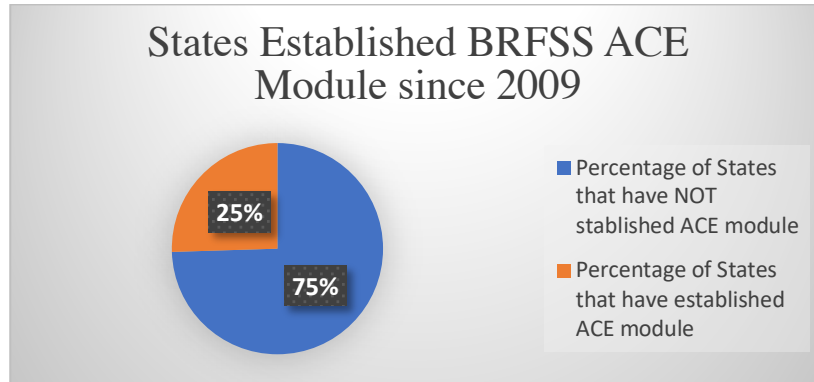


Figure 1. Percentage of the states that established ACE module since 2009

4.2 ACE-Related Legislations in the US

Throughout the US, only 48% of the states have ACE-related legislations within various sectors. Yet, the other 26 states (52%) have no legislation to address ACEs (Figure 2). The information on Puerto Rico and U.S. territories for ACE legislation was not evident.

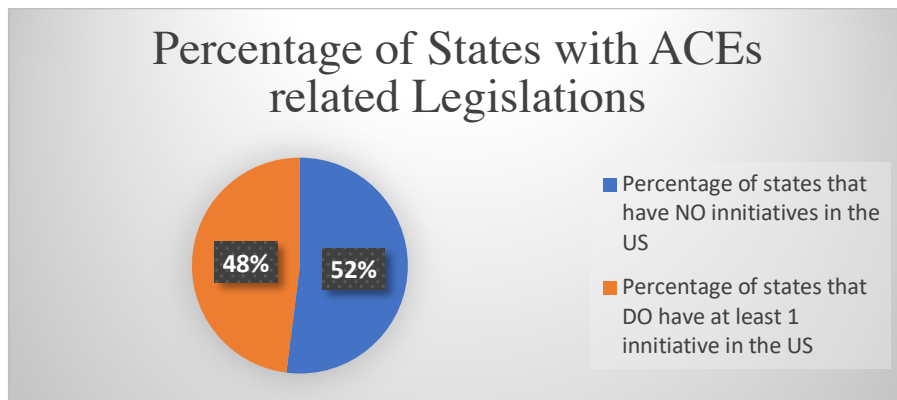


Figure 2. Percentage of states with at least one ACE-related Legislation

Among the 24 states that have legislation to address ACE, California and Vermont have 7 specific initiatives, Washington state has 6, Massachusetts has 5, and Oregon and Tennessee have 4. (Figure 3).

Among the 24 states with ACE-related legislation, 12 states have only one ACE-related legislation. Five states have two legislations including New Mexico, New York, Texas, Virginia, and Wisconsin. Only seven states have more than three legislations to address ACEs including California, Massachusetts, Oregon, Tennessee, Vermont, Washington State, Wisconsin, and Arizona. California and Vermont with seven legislations have the highest number of ACEs related legislation across the states (*Figure 3*).

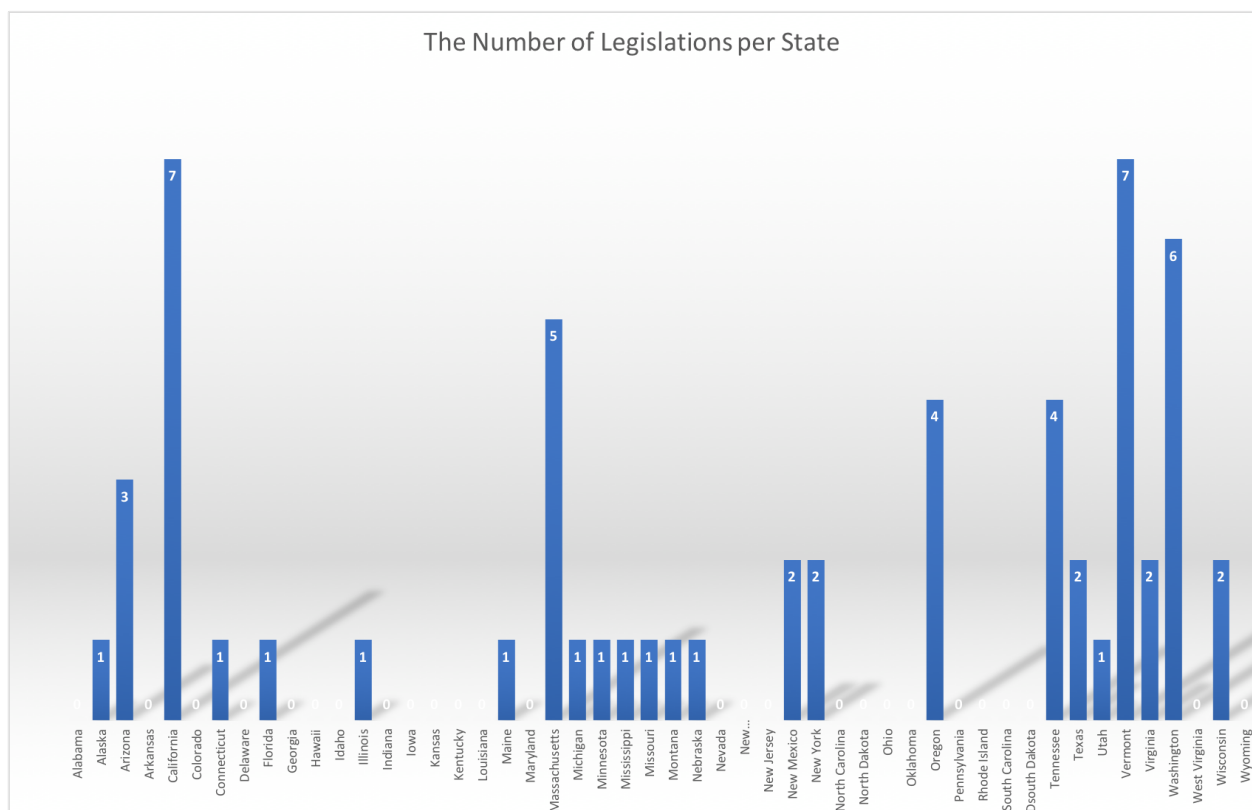


Figure 3. The Number of ACE-related legislations per state

Among the 24 states having ACE-informed initiatives, four have resolution to address ACEs. Alaska and Utah have only one resolution each, and no legislation related to ACEs. Alaska resolution is associated with the healthcare sector and Utah resolution is associated with child welfare. Oregon has two legislations associated with healthcare and awareness raising, and one resolution associated with child welfare. Virginia has one resolution and one legislation.

4.3 Specific States with House and Senate Bills

Using the *At-A-Glance 2017 Proposed Legislation ACEs/Trauma-Informed Policy* provided by ACE Connection Network, four states had both house and senate bills enacted: Massachusetts, Tennessee, Virginia, and Washington state. In Massachusetts, the SB 876 and HB 328 bills require training for the police officers assigned in schools. In Tennessee, SB 197 and HB 274 bills address ACEs and juvenile justice sentencing and parole. Furthermore, HB 616 and SB 552 bills mention adversities associated with the report on minor victims of trafficking. In New Mexico, SB 175 and SB 289 address home visiting programs. In Virginia, SR 101 and HJR 653 focus on resolutions for Trauma-Informed Community Networks to identify proper practices to address toxic stress and childhood adversity. In Washington State, the State and House bills focus on WorkFirst Poverty Reduction Oversight Task Force to address and prevent ACEs. In addition, in Washington, State and House bills, approved by the Governor in 2017, mention Childhood adversity in legislative findings on children and mental health care (ACEs Connection, 2018a).

4.4 Identifying Four Main Sectors Targeted by ACE-Informed Legislations

After a thorough examination of all collected documents, it was confirmed that current ACE initiatives are taking place within the following four sectors: education, healthcare, child welfare, and juvenile justice. Most legislation are associated with child welfare sector. Only six legislations address juvenile justice system (*Figure 4*).

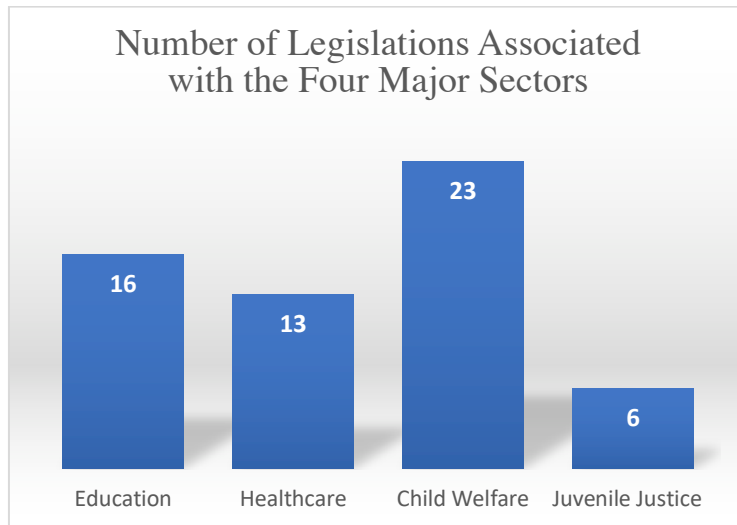


Figure 4. Number of states have legislation per category

4.4.1 Legislations in Education System

In the education system, California has a Senate bill to provide coordinated mental health services in schools for children to recover from traumatic experiences (SB 191). In Illinois, there is a Senate bill outlining social and emotional screenings for children as part of the school entry examinations (SB 565).

In Vermont, a House bill exists that requires training materials for pre-K teachers to identify children exposed to ACEs and refer students to services. The House bill also provides for school nurse family wellness coaching training, trauma programming for children of incarcerated parents, and development of a plan for creating a trauma-informed school system throughout Vermont (HB 23). Furthermore, based on a House bill, weighting factors for students from lower-income families will be increased as a proxy for students who experienced ACEs (H.B.439). In Oregon, there is a House bill that requires state education agencies to address regular absences of students and provide funding for trauma-informed interventions in schools (Hb 4002).

4.4.2 Legislations in Healthcare System

In the healthcare system, Alaska has a House resolution referred to Health and Social Services, urging the Governor to join with the Alaska state legislature to respond to the public and behavioral health epidemic of ACEs by establishing a statewide policy and providing programs to address this problem (2016) (HCR 2).

California has several legislations associated with the healthcare system. Based on an Assembly Concurrent Resolution, the legislature urges the Governor to reduce children's exposure to ACEs, address the impact of ACEs, and invest in preventive health care and mental health and wellness interventions (ACR 155). An Assembly bill requires trauma screening under the Medi-Cal (Medicaid) Early and Periodic Screening, Diagnosis, and Treatment Program (EPSDT) (AB 340). An Assembly bill requires grant programs to support local partnerships to test innovative early childhood system approaches for children from birth to three-years-old and their families who experience ACEs (AB 11). Based on Assembly bill 1340, the Medical Board urges to consider a course for primary care providers on integrated mental and physical health care, to identify and treat mental health issues in children and young adults (AB 1340).

Maine has a legislation that requires nursing services in communities that lack these services, or they are inadequate. These services include early diagnosing of children at risk for adversities to prevent mental and physical health issues (LD 1108).

In 2015, Minnesota included ACEs in legislation to provide eligible services under Children's Mental Health grants to include training for parents, collaborative partners, and mental health providers on the impact of ACEs and trauma (Association of State and Territorial Health Officials, 2018; Minn. Stat. § 245.4889).

In Mississippi, a State bill refers to ACEs in establishing a mental health summit (SB 2798).

In Missouri, a House bill encourages primary care providers to utilize the ACE Questionnaire to assess a HealthNet participant's health risks (HB 1175).

In Montana, a House bill requires the Department of Public Health and Human Services to develop guidelines and request proposals for pilot projects to prevent or reduce ACEs. The House bill also requires the department to review evidence-based and research-based programs or proposals and make recommendations to the governor, the legislature, and others (HB 264).

In New York, an Assembly bill requires home health care professionals to use the ACE questionnaire in assessing the patient's health risks and makes Medicaid reimbursement of primary care providers contingent upon such use (AB 3427).

In Oregon, a legislation (2013) requires community health improvement plans to be based on research, including research into ACEs (Or. Rev. Stat. § 414.629). Furthermore, a Resolution encourages state officers, agencies and employees to become informed regarding impacts of trauma and to implement evidence-based trauma-informed care practices and interventions (HCR 33).

In Texas, legislation House bill proposes trauma-informed training for employees of state-supported living centers and intermediate care facilities (HB 2789).

In Vermont, a House bill proposes to impose an excise tax on sugar-sweetened beverages and to direct revenue from the tax to the Adverse Childhood Experiences Initiative Fund (HB 214). There are two other legislations under healthcare. A bill that has passed the House and Senate in 2014 requires a review of evidence-based materials on the association of adversities and public health and addresses ACE-informed medical practice (H. 596). Furthermore, a House bill creates incentives for Blueprint for Health practices to use a voluntary, evidence- or research-based adverse childhood experience screening tool with patients and families (HB 23).

In Washington State, a legislation establishes a pilot program in child care facilities to provide multi-tiered behavioral support for children from birth to five. Slots must be reserved for children with ACEs and advisory council must include an ACEs expert (HB 1639). Another legislation mentions ACEs in legislative findings on children and mental health treatment.

In Wisconsin, there is one funding initiative under healthcare sector that requires Brighter futures Initiative to provide funding for entities for programs that prevent and reduce the incidence of adverse early childhood experiences in children 8 years of age and under and reduces the effects of those experiences through behavioral health and other services (Wis. Stat. § 48.545). A Senate Joint Resolution requires the state legislature to consider the principles of early childhood brain development, toxic stress, early adversity, and buffering relationships, and note the role of early intervention and investment in early childhood years (SJR 59).

4.4.3 Legislations in The Child Welfare System

According to the findings of the present study, Arizona has two legislations in the child welfare system. There is one training program for child welfare investigators that includes impact and intervention practices related to ACEs and one legislation for child safety workers to be trained and demonstrate competency in impact and intervention practices related to ACEs (Ariz. Rev. Stat. § 8-471). A bill urges child safety workers to be trained and demonstrate competency in impact and intervention practices related to ACEs (2014) (Ariz. Rev. Stat. § 8-802). Furthermore, a House bill requires to establish the ACEs study committee (HB 2198).

In California, based on a Senate bill, no state or local resources are diverted to fuel any attempt by the federal government to carry out mass deportations, so that public institutions are safe spaces for children, families, and communities (SB 54). Additionally, another Senate bill requires to

create a Bill of Rights for Children and Youth that would promote social and emotional skills, support parents, and otherwise buffer children from adversity and toxic stress (SB 18).

In Connecticut, a House bill establishes a task force to identify evidence-based solutions to reduce children's exposure to adverse childhood experiences (HB 6742).

In Florida, a Senate bill requires community-based organizations to provide child protective services for the state to consider services that are evidence-based and trauma-informed (SB 7078).

In Massachusetts, according to a House and a Senate bill, the foster care review office governing board must include a pediatrician with expertise in the field of ACEs (HB 328; SB 876).

In Michigan, a Senate bill requires adequate funds to support statewide ACE intervention services (SB 30).

In Nebraska, a legislative bill refers to ACE Study in a bill creating the Children's Connection program (LB 552).

New Mexico has two legislations. In 2013, a Senate bill determined home visiting program as a strategy to improve child well-being and prevent ACEs (SB 175). The second Senate bill emphasizes that the early Childhood Education Department definition of *home visiting* includes the delivery of support services for a participating family to promote child well-being and prevent adverse childhood experiences that impair brain development and impede school readiness (SB 289).

In New York, a legislation establishes a task force to identify evidence-based and evidence-informed solutions to reduce children's exposure to ACEs (AB 3424).

In Oregon, a Senate bill mentions ACEs related to the task force on children of imprisoned parents (SB 241).

In Utah, there is a concurrent resolution to encourage state policy and programs to incorporate ACEs science to address severe emotional trauma and other ACEs in children and adults and implement evidence-based interventions to increase resiliency (HCR 10).

In Vermont, a legislation establishes the ACEs Working Group for the purpose of investigating, cataloging, and analyzing existing resources to mitigate childhood trauma, identify populations served, and examine structures to build resiliency in 2017 (H. 508). Another House bill requires the expansion of the existing Nurse-Family Partnership program. This bill establishes a trauma-informed service director to develop and coordinate evidence- or research-based and family-focused initiatives to prevent ACEs, and to coordinate services for individuals. It also creates the Trauma and Resilience Task Force to design and implement the system and statewide efforts to address trauma (HB 281).

In Virginia, two Resolutions are enrolled to commend Trauma-Informed Community Networks for their work to improve best practices, to address toxic stress and childhood trauma, and to become trauma-informed, resilient communities (HJR 653; SR 101).

In Washington State, House and Senate bills address ACEs. WorkFirst Poverty Reduction Oversight Task Force aims to prevent and address ACEs (HB 1482; SB 5440).

4.4.4 Legislations in Juvenile Justice System

In juvenile justice setting, Tennessee has House and Senate bills addressing ACEs and juvenile justice sentencing and parole (HB 274; SB 197) and mentioning ACEs related to reporting on minor victims of trafficking (HB 616; SB 552).

Texas has a training initiative. A State bill requires juvenile justice staff to receive trauma-informed training (SB 1356).

4.5 Initiatives at the Community/Local Level

The National Child Traumatic Stress Network (NCTSN) provides a database to report the programs and initiatives happening at the local/community level throughout the states. In this report, there is a list of NCTSN members and their programs in every state (NCTSN, n.d.). For example, in Garden City, New York, the Adelphi University School of Social Work established an institute called *Adolescent Trauma Treatment and Training* in 2012. The objective of the program is to enhance the community engagement and investigate effective treatment for traumatized adolescents. (ADELPHI UNIVERSITY, n.d.). The participants of this program can implement their acquired trauma therapy skills in several service-providing areas for adolescents, such as *MercyFirst*, which is one of the largest programs in New York providing services for traumatized youth (MercyFirst, n.d.).

In El Paso, Texas, the *Alivian Community Treatment and Services (CTS) Center* work to provide training on effective trauma therapy, to collaborate with partners, and to enhance community engagement to implement community-based programs according to NCTSN report (National Child Traumatic Stress Network, 2018).

Moreover, other innovative programs implemented by the Frontiers of Innovation (FOI) from the Harvard University's Center on The Developing Child and the Healthy Families America (HFA) are examples of successful innovative programs at the community level (Healthy Families America, 2018).

In New Mexico, There is a community-based initiative at the local level that Bernalillo County's Behavioral Health Initiative is dedicating about \$6 million over two years to reducing ACEs. The pilot program, called *ACEs* for short, will help fund eight providers that offer support to children and families experiencing trauma (Bernalillo County State of New Mexico, n.d.).

5 DISCUSSION

The ACE study discovered the negative impact of childhood adversities throughout the lifespan (Dube et al., 2001; Felitti et al., 1998). The data collected from the optional ACE module presented by BRFSS, the National Child Abuse and Neglect Data System (NCANDS) and other datasets highlight the high ACEs prevalence and ACE-related issues among the population. This alarming fact requires evidence-based approaches for prevention, treatment, and resilience-focused interventions at the state level to address the ACE negative impact throughout the US.

The original ACE study started in San Diego around twenty years ago to make a change in the healthcare system. Therefore, the findings that California has seven initiatives to dates is expected. California legislations are associated with the education, healthcare, and child welfare sectors. On the east coast, Vermont appears to be taking aggressive initiatives related to ACEs within the education, healthcare, and child welfare sectors (ACEs Connection, 2018a).

Having five legislations to address ACEs, Massachusetts and Washington State are advanced around ACE-informed legislations. Washington State was one of the first states to implement the optional ACE module in 2011 (Association of State and Territorial Health Officials, 2018). A multisector stakeholder planning group was required by law to identify approaches for ACE reduction and prevention in Washington State in 2011. Washington State legislations are related to the education, healthcare, and child welfare sectors. Massachusetts legislations are associated with education and foster care. Tennessee with four legislations associated with juvenile justice and trafficking is also progressive in ACE-focused legislations (ACEs Connection, 2018a).

5.1 Identifying the Major Gap

The aim of the present study was to understand what exists in terms of the policies, interventions, and initiatives around ACEs at the state-level. From the present assessment, it was clear that more

states may need to implement the ACE module as part of the annual BRFSS survey administration. The administration of the ACE module provides states an opportunity to continue monitoring the population and inform child welfare and other related state sector programs that serve children about the population burden of ACEs. Therefore, one of the biggest public health gaps is the lack of data on the prevalence of ACEs across states. However, a limitation of this finding was the inability to track state-added questions for the ACE. Therefore, many states may not have a clear understanding of the population burden of ACEs in their respective states. Lack of data on the ACE prevalence among the population may correspond to the gap in state policies and initiatives. A finding from the present assessment was that a significant number of programs are implemented in various sectors at the community level to address ACEs. Programs implemented by the Frontiers of Innovation (FOI) from the Harvard University's Center on The Developing Child and the Healthy Families America (HFA) are good examples of successful initiatives at the community level that should be brought to the attention of state-level policymakers and legislators. The community-based initiatives should be used to incorporate ACE-related policies and initiatives at the state level.

5.2 Translating Legislations to Practical Effective Interventions and Programs

According to the findings, most of the initiatives around ACEs are legislations mainly in child welfare and education sectors. However, to have a strong impact on ACEs prevention, legislation should exist that cover multiple sectors. Most of the community-level efforts that utilize trauma-informed programs should also be integrated at the state level. Adequate resources should be allocated at the state level to raise awareness for ACEs prevention and treatment purposes. The stakeholders should be identified and be trained to have the ACE informed programs. Proper training is required for these four main sectors to enlighten the ACEs burden and impact on the

overall output of each sector. Moreover, an interdisciplinary partnership among various sectors enables sectors to have a multilateral need assessment to identify the gaps and establish proper interventions.

5.3 Reduce the Social and Economic Burden of ACEs

As revealed in the literature, the health and psychological outcome of ACEs is broad, from depression to various types of cancer in the population (Brewer-Smyth et al., 2016; Fagundes et al., 2013; Felitti et al., 1998; Janusek et al., 2013; Thomas et al., 2008; Xie et al., 2010). The morbidity and mortality rates of ACEs is dramatically high. To date, there is no clear estimation of the cost of treatment and economic burden for US ACEs survivors in the literature. However, according to the evidence-based data showing a high prevalence of ACEs in the adult population throughout the country, the economic burden for various ACEs related health problems is high. Critically, increasing ACE informed policies, legislations, interventions, and programs at the state level will have a significant impact to reduce the social and economic burden of the ACEs in the country.

5.4 Limitations

This study was subject to limitations. One key limitation was the inability to track state-added questions for the ACE. As a result, the number of states that utilized this option to track the ACEs prevalence is missing in our findings. Another limitation was that the information on Puerto Rico and U.S. territories for ACE legislation was not evident. Second, some legislation language was general. Therefore, the identified sector might be misclassified due to Ambiguous language. Further clarification will be needed. The other key limitation was inconsistency information provided in CDC website that needs to be further clarified. Moreover, lack of access to all bills and legislations from all

states was a limitation that might have impacted the results provided. Furthermore, the source of information pulled from internet may be outdated.

5.5 Conclusions and Recommendations

Based on the preliminary findings of the present study, additional assessments are needed to gather more in-depth information about the ACE-related legislations at the state level. The following precursory recommendations may inform future efforts in this area:

1. All states should periodically implement the optional BRFSS ACE module to monitor the burden of ACEs in the adult population.
2. Solution-oriented awareness raising initiatives are needed to detect the risk factors, at-risk population, and social disparities to identify preventive strategies.
3. At the state level, adequate resources should be allocated to develop effective strategic plans to address ACEs in various sectors.
4. A variety of stakeholders and partners in the child welfare, healthcare, education, and juvenile justice sector should be identified and informed on the major health, social, and economic burden of ACEs.
5. Public-Private Partnership (PPP) can be an effective approach to target ACEs related issues at the state and national levels.
6. Community and state-level initiatives should be carefully monitored and evaluated to ensure the effectiveness and sustainability.
7. Successful and innovative initiatives at the local/community level should be identified and tested at a broader level to develop and improve the policies and programs at the state and national level.
8. Advocacy is a crucial approach to point out the gaps, maintain and expand the required ACE-related policies and interventions for a sustainable impact.

5.6 Future Directions for Research in This Area

In the 2009 meeting report, World Health Organization (WHO) had prioritized prevention of child maltreatment and supported ACEs-informed policies and initiatives to enhance public health globally. In this meeting report, recommendations were provided for policymakers for implementation and evaluation of ACE-related strategies around the world. Developing a clear presentation to convey the ACE concept, impact, and implications to enhance ACE awareness and bring various potential sectors on board was proposed in the 2009 meeting report (World Health Organization, 2009). Considering ACEs as a global issue, tracking ACE-focused policies, legislation, initiatives and programs at the international level can be the future directions for research in this area.

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