

Using Evidence Based Home Visiting for Preventing Intergenerational Adverse Childhood Experiences

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Abstract

A body of literature has amassed in recent years examining risk factors and outcomes for children who have experienced various forms of trauma. Childhood maltreatment in various forms has commonly been termed adverse childhood experiences (ACEs), which are severe enough to negatively impact mental and physical health in both childhood and adulthood, as well as lead to a variety of undesirable life outcomes for affected adults. Less has been studied regarding the cyclical nature of child maltreatment and the effects that parents' own history of childhood trauma may have on their children's experience of trauma. Recent research has evaluated intervention strategies such as evidence-based home visiting (EBHV) programs for mothers and infants/toddlers that address this phenomenon and aims to interrupt the cycle of maltreatment. The benefits of home visiting will be reviewed and policy and cost implications related to preventive intervention are discussed.

Keywords

Home Visiting, Early Childhood Intervention, Adverse Childhood Experience, ACE, Trauma

1. Introduction

Recent examinations into the outcomes of childhood trauma have resulted in findings that demonstrate the notion that extreme childhood adversity is not only linked to undesirable juvenile and adult behaviors, but that there is also an intergenerational risk factor associated with adverse experiences at a young age (e.g., Bifulco et al., 2002; Chartier, Walker, & Naimark, 2010; Felitti et al., 1998; Gregorowski & Seedat, 2013; Mersky, Topitzes, & Reynolds, 2013; Sameroff,

2000). The original Adverse Childhood Experiences (ACEs) Study (Felitti et al., 1998) and many follow-up studies on ACEs clearly show that exposure to childhood trauma affects the way juveniles and adults perceive and respond to the world, adversely affecting many aspects of their social, emotional, and physical well being. The notion that parents who experienced childhood trauma are at higher risk for transmitting trauma experiences to their own children—with implications for a plethora of stakeholders, including policy makers, medical and mental health professionals, educators, and social and human services providers—is the focus of the present analysis.

In this paper, the literature on childhood trauma is explored, focusing on the prevalence of ACEs and the extent to which they have been found to negatively affect physical health and social outcomes. Next, we will introduce how parents who were victims of childhood trauma may unintentionally expose their own children to traumatic experiences; thus transmitting trauma across generations. This discussion will focus particularly on attachment theory, which proposes that parents who did not have secure attachments to their own primary caregivers may be less able to form secure attachments with their own children. In the following sections, we present the position that evidence-based home visiting (EBHV) programs, such as Early Head Start (EHS), Healthy Families America (HFA), Parents as Teachers (PAT), and Nurse Family Partnership (NFP), are uniquely positioned to break the intergenerational transmission of childhood trauma, such as ACEs. This position is not completely novel; indeed, many home visiting programs include initiatives with this exact goal in mind (an excellent example is the Health Federation of Philadelphia's (2015) Enhanced Home Visiting Program). Specifically, we propose that EBHV efforts focus on strengthening the attachment between caregivers and children to decrease the likelihood of children experiencing these same types of traumas. The reasoning behind this proposition is that: A) EBHV programs are designed to serve women categorized as “at-risk” due to a variety of demographic factors, including single-parent household status, age at time of first pregnancy, being categorically undereducated, under or unemployed, and meeting federal standards of living at or below the poverty line; B) these programs serve women during pregnancy and/or shortly after the birth of their children, offering an excellent chance for the early prevention of trauma exposure; and C) intervention services are provided at the same times that attachment (whether secure or insecure) is being developed between mothers and children, providing the opportunity that generational risk may be mitigated. The potential positive outcomes associated with intervention-based programming will be discussed in relation to their ability to generate lasting results, and program implementation, including data from a cost/benefit analysis will provide additional context for policy decisions.

2. Adverse Childhood Experiences

Research on the effects of childhood trauma has been accumulating for decades

(e.g., Curtis, 1963; Kempe, Silverman, Steele, Droegemueller, & Silver, 1962; Mersky et al., 2013). Investigations into developmental psychopathology, which emerged as a distinct field of study in the 1960s, led to the initial understanding of the role of environmental factors on childhood experiences and subsequent mental health (Sameroff, 2000). Rutter & Quinton (1977) found that factors existing in children's social environment were linked to health-risk behaviors later in life, and were the first researchers to describe neglect, abuse, and other forms of maltreatment (what would later be considered adverse childhood experiences, or ACEs) in terms of their cumulative effect, range of adversity, and wide-reaching impact on both mental and physical health over the course of an individual's lifetime.

The original ACE Study, conducted at Kaiser Permanente Hospital in San Diego, California, was the first attempt at comprehensively examining the potential relationship between ACEs and negative health outcomes in adulthood (Felitti et al., 1998). This study was particularly innovative as it culminated in the description of three categories of potential trauma (abuse, neglect, and household dysfunction) and the subsequent incidence of risk factors for disease, perceived quality of life, health care utilization, and mortality/morbidity. Factor-style coding was used to clarify the link between the occurrence of childhood trauma and later negative health outcomes in adulthood. In addition, health risk factors were examined in proportion to the cumulative experience of ACEs, which resulted in a more detailed explanation of the rate at which negative health outcomes increase as a function of increased scoring on the ACE questionnaire. With this data, researchers were able to explore and connect other variables including mental health, coping strategies, prevention and intervention options, and public health policy implications associated with the ongoing cycle of ACEs (e.g., Anda et al., 2006; Chapman et al., 2011).

2.1. Definition

In order to begin to explore ACEs and their relationship to health outcomes, it is essential to understand what is categorically included as being an adverse childhood experience. Traumatic events have been broadly defined in the research literature; various terms have been used to describe these events, including abuse, neglect, and maltreatment. However, no single definition has combined the conceptual dimensions of these constructs into the broader category of childhood adversity. To this end, Kalmakis and Chandler (2014) developed a working definition of ACEs in order to incorporate various elements of trauma to create the framework for a more standardized screening methodology. Their adherence to Norris's (1982) five-step approach to concept clarification led to a definition that encompassed patterns of trauma that could be grouped, making for a more recognizable term that would accommodate cross-disciplinary usage. This operational model resulted in the following definition:

Adverse childhood experiences are childhood events, varying in severity

and often chronic, occurring within a child's family or social environment that cause harm or distress, thereby disrupting the child's physical or psychological health and development (Kalmakis & Chandler, 2014: p. 1495).

Even with a conceptual definition of ACEs, further delineation into categories of behavior can help illuminate which types of trauma, specifically, are linked to negative health outcomes and in what capacity. Although there are certainly other events that could be categorized as traumatic, it is helpful to designate specific categories in order to provide the most reliable scale to refer to in clinical and other professional settings and for the purpose of standardizing qualifications of traumatic experiences. As defined by the Centers for Disease Control and Prevention (CDC), ACEs occur in three categories: abuse, neglect, and household dysfunction (CDC, 2014). Within these categories, the CDC identified 10 subcategories: abuse includes physical, emotional, and sexual abuse; neglect includes physical and emotional neglect; and household dysfunction includes mental illness, violence towards the mother, divorce, having an incarcerated relative, and substance abuse. Questions regarding/addressing each subcategory make up the 10-item questionnaire used to produce an individual's ACE score.

2.2. ACE Prevalence

Studies on the prevalence of ACEs, typically conducted in a retrospective fashion by asking adults about whether they experienced any of the 10 types of childhood trauma, have repeatedly demonstrated that ACEs are far too common. In Felitti et al. (1998) original study, 52% of the respondents reported at least one ACE, demonstrating that over half of the sample had experienced at least some childhood trauma. The most common ACE categories reported by the respondents were having lived with someone who abused substances (26%), having been sexually abused (22%), having lived with a household member with mental illness (19%), and having lived in a household in which the female caregiver was a victim of domestic violence (13%). Twenty-five percent of the respondents experienced a traumatic event in only one ACE category, whereas 13%, 7%, and 6% experienced traumas in two, three, and four or more ACE categories, respectively. Felitti et al. (1998) also noted a high probability that individuals who were exposed to trauma in one ACE category were also exposed to trauma in other ACE categories, a finding that has been repeatedly reported in the literature (e.g., Appleyard, Egeland, Van Dulmen, & Stroufe, 2005; Chartier et al., 2010; Same-*roff*, 2000).

One of the most important findings of the original ACE study was that ACEs were significantly related to a host of health-risk behaviors in adults, and that the relationships were dose-specific, such that as the number of reported ACEs rose, the number of health-risk behaviors rose incrementally. For example, odds ratios showed that respondents who reported experiencing four or more categories of ACEs were 2.2 times more likely to currently smoke, 7.4 times more likely to be

an alcoholic, 10.3 times more likely to have ever injected illicit drugs, and 12.2 times more likely to ever have attempted suicide when compared to those with no exposure to ACEs (Felitti et al., 1998). A similar dose-response relationship was found regarding adult health outcomes. Again, odds ratios revealed that respondents who experienced four or more categories of ACEs were 2.2 times more likely to have ischemic heart disease, 2.4 times more likely to have had a stroke, 2.4 times more likely to have ever had hepatitis or jaundice, and 2.2 times more likely to report fair or poor health compared to those with no exposure to ACEs. The tendency for number of ACEs to predict health-risk behaviors and/or negative health outcomes has been reported in a number of subsequent studies as well, including those with more diverse samples than in the original investigation (e.g., Anderson & Blosnich, 2013; Mersky et al., 2013; Schilling, Aseltine, & Gore, 2007).

Understanding how ACEs influence health-risk behaviors and health outcomes is perhaps easiest done by reviewing the ACE Pyramid Model (see Figure 1). According to this model, experiencing childhood trauma does not necessarily guarantee a negative health outcome in adulthood (e.g., being exposed to childhood psychological abuse does not, in itself, lead to adult stroke). Rather, the experience of childhood trauma triggers a chain of events that ultimately result in negative health outcomes, including disease, disability, and early death. As seen in Figure 1, the theoretical progression is as follows: first, children experiencing one or more ACEs likely suffer subsequent social, emotional, and/or cognitive impairments. These impairments (for example, an inability to trust others or function well in school) increase the likelihood that these children—generally as adolescents or young adults—will engage in health-risk behaviors (such as using alcohol or drugs to cope with social isolation, engaging in delinquent behaviors, failing out of school, etc.). These health-risk behaviors

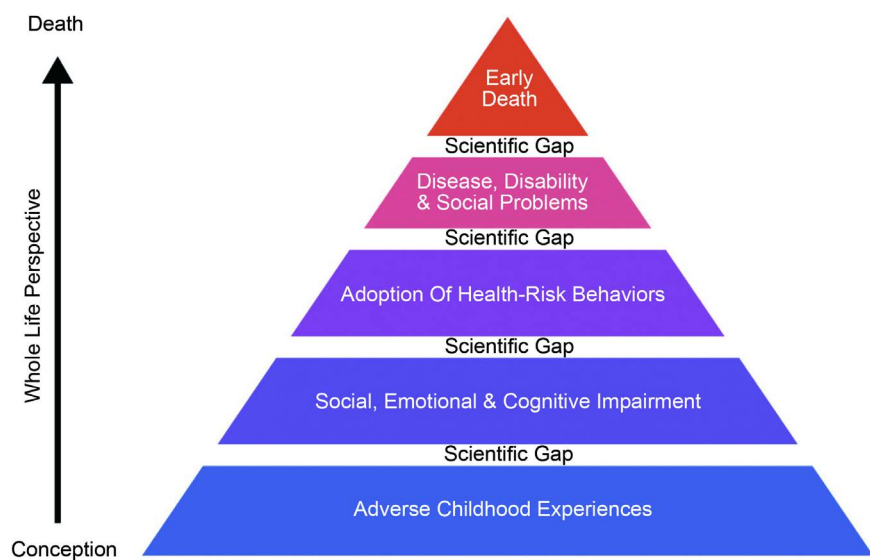


Figure 1. The ACE pyramid.

<https://www.cdc.gov/violenceprevention/acestudy/about.html>

then lead to the onset of disease or disability (for example, liver problems resulting from heavy alcohol use), which in turn increases the likelihood of an early death. Although the CDC noted that there are gaps in the model, particularly in the first two transitions (i.e., ACEs to impairments and impairments to risky behaviors), there is emerging literature that provides greater empirical support for this pattern/phenomenon.

In a review of relevant literature on how child maltreatment affects neurodevelopment, [Putnam \(2006\)](#) demonstrates how neglectful and abusive environments affect the size of developmental regions of the brain, as well as brain neurochemistry. For example, he describes studies (e.g., [De Bellis et al., 1999](#)) with results that show how abused children tend to have underdeveloped frontal lobes, including in areas responsible for exercising judgment and behavior regulation. Other studies (e.g., [Anderson et al., 2008](#)) have shown that high levels of stress (such as that induced by exposure to ACEs) lead to dysregulation of the limbic system, resulting in a rewiring of the brain which causes children to be more anxious and hyper-responsive to negative social cues, such as angry facial expressions from others. Thus, there is certainly some evidence buttressing the notion that, as the ACE Pyramid Model suggests, childhood trauma leads to changes in the brain that are associated with social, emotional, and cognitive impairments.

Despite the CDC's characterization of a "scientific gap" between social, emotional, and cognitive impairment and the adoption of health-risk behaviors, there is empirical evidence for a link between the two. While not implying causation, recognition of the association helps elucidate the opportunity for intervention as a means to interrupt this cycle. As noted earlier, [Felitti et al. \(1998\)](#) original ACE study clearly showed that people who reported experiencing a greater number of ACEs were more likely to smoke, drink heavily, and use illicit drugs; additional studies placed an even greater focus on this linkage. Thus, children raised in households with high levels of conflict are more likely to engage in behaviors that put them at risk for a variety of negative health outcomes. Also consistent with the ACE Pyramid Model, [Repetti, Taylor, & Seeman's \(2002\)](#) "Risky Families Model" postulates that the adoption of health-risk behaviors stems from emotional and social deficits, which result from traumatic familial social context. Taylor and her colleagues ([Taylor, Lerner, Sage, Lehman, & Seeman, 2004](#)) reported evidence to support the Risky Family Model; showing that children with dysregulated autonomic responses to stress—influenced in part by growing up in "risky families"—were more likely to engage in health-risk behaviors ranging from substance abuse to unsafe sexual practices. It is essential to note that even where the ACE Pyramid Model is portrayed as having scientific gaps, there are, in fact, ample sources of evidence to support the transitions between levels of the pyramid itself.

The discussion above establishes that ACEs are a common phenomenon, and that it often sets into motion a chain of activities and events that ultimately lead

to undesirable individual and social outcomes. Sadly, the research establishes that there is a high probability of intergenerational transmission of childhood trauma; this has been found to be true for a variety of forms of trauma (e.g., neglect, physical and sexual abuse, domestic violence, substance abuse) in numerous samples of parents and children (e.g., [Langeland & Dijkstra, 1995](#); [Pears & Capaldi, 2001](#), [Stith et al., 2000](#); [Widom, Czaja, & DuMont, 2015](#)). In short, adult caregivers who faced traumatic experiences as children tend to expose children in their care to similar types of experiences. Thus, it is essential for interventionists to break the cycle of intergenerational trauma exposure. Though parental experience of trauma cannot be retroactively undone, understanding the effects of exposing their own children to trauma may help parents and other adult caregivers circumvent the child's future experience of negative health outcomes as an adult.

2.3. Adult Health Outcomes

The primary purpose of the initial ACE study was to identify negative adult health outcomes associated with childhood trauma. Once it became clear that there was, in fact, a strong correlation between ACEs and adult health, [Felitti et al. \(1998\)](#) identified 10 health-risk behaviors as predictors of adult morbidity and mortality. The risk factors included smoking, severe obesity, physical inactivity, depressed mood, suicide attempts, alcoholism, drug abuse, parental drug abuse, a high lifetime number of sexual partners (>50) and a history of having a sexually transmitted disease ([Felitti et al., 1998](#)). These risk factors are frequently present in the population most often served by EBHV programs, which increase the risk of negative behavior transmission between mother and child ([Bifulco et al., 2002](#)). Due to their severity, the negative adult health outcomes associated with ACEs may lead to long-term dependence on the health care system. Therefore, reduction in the reliance on public health systems by this population is an additional benefit to participation in EBHV interventions. While participating in home visitation programs, mothers are encouraged to improve their negative health behaviors and model positive lifestyle choices for their children. This could lead to less long-term utilization of the health care system for both mother and child.

Research surrounding this topic has grown to include detailed descriptions of the associations between ACEs and many negative mental and physical health outcomes, including suicidal ideation and behavior (e.g., [Isohookana, Raila, Hakko, & Räsänen, 2013](#)), anxiety (e.g., [Reiser, McMillan, Wright, & Amsundson, 2014](#)), substance abuse (e.g., [Mersky et al., 2013](#)), and cancer ([Brown, Thacker, & Cohen, 2013](#)). While this is not a comprehensive list, it explicates the risks associated with leaving the generational transmission of ACEs untreated. One way to interrupt this cycle is by encouraging strong bonds between parents or other primary caregivers and children. This type of attachment has longitudinally impacted children's social and emotional development.

3. Attachment Theory

Generally, the first exposure an infant has to human interaction is with their primary caretaker, usually the mother. Decades of research suggest that this relationship has critical and enduring significance throughout the child's lifetime. A common approach to addressing this relationship is by utilizing constructs from attachment theory, which was developed by Dr. John Bowlby in the mid-20th century. Attachment theory centers on the assertion that a child, especially during infancy and early childhood (roughly 3 - 30 months of age) should have a "warm, intimate, and continuous relationship with his mother" to help prevent negative mental health outcomes as an adult (Bowlby, 1951: p. 361). In attachment theory, "maternal deprivation" refers to the absence or lack of affection from a mother or mother figure towards a child at any point in early childhood development (Bowlby, 1951). As such, maternal deprivation is the cause of unformed or weak attachments between mother and child regardless of the physical presence of the mother (or permanent mother-figure), duration of time during which affection is lacking, or severity of affect-deprivation (Bowlby, 1951). Building from this, Bowlby was one of the first to link maternal deprivation to the psychological outcomes of children. Rooted in ethology, physiology, psychoanalysis, and developmental psychology, Bowlby's theory that infant/caretaker bonding has behavioral ramifications well into adulthood has served as the bedrock in developing clinical work with children and families.

In her series of "strange situation" experiments starting in 1969, Dr. Mary Ainsworth expanded attachment theory by identifying three separate categories of bonding that occur between infants and their primary caregiver: secure, anxious/ambivalent, or anxious/avoidant (Ainsworth, 1985). Secure attachments are characterized by the child feeling free to explore while in the caretaker's presence, but becoming nervous during separation and offering a welcoming reunification. Anxious/ambivalent attachments are marked by anxiety and insecurity during caretaker presence; babies are upset when the caretaker leaves, but also have trouble reuniting because of their distress. Children with anxious/avoidant attachments are likely to display feelings of anger and are usually not bothered by the caretaker's absence or presence; they effectively avoid the caretaker because they believe they are not able to depend on the caretaker for their needs (Ainsworth, 1985). These foundational interactions can then eventually manifest in internalizing and externalizing behaviors such as substance abuse, eating disorders, or high risk behaviors, impacting significant relationships throughout the course of an individual's life (Ford, 2005; O'Connor, Collins, & Supplee, 2012; Page, 1999).

A child's attachment to their caretaker is largely dependent on the emotional and physical presence of the parent from early on. A chronically angry or rejecting parent is therefore likely to foster an avoidant attachment. Similarly, the inability for a parent to respond to their child's cues for attention will create an ambivalent attachment (Ainsworth, 1985). Likewise, the mental state of the parent

influences attachment as well. A parent in a constant state of stress, trauma, or panic can unknowingly communicate these feelings non-verbally to their child, who will then internalize those feelings (Shemmings & Shemmings, 2011). Children who experience secure attachments are likely more socialized and therefore have a better chance of contributing positively to society as adults, because secure attachments encourage their cognitive, emotional, social, and psychological development (Dannerbeck, 2005; Page, 1999). The first five years of a child's life are a crucial period for such development and addressing ambivalent or avoidant attachments early in the child's developmental process has the potential to mitigate the future implications of insecure attachments (Gregorowski & Seedat, 2013; Karoly, Kilburn, & Cannon, 2006; Weitzman & Cook, 1986).

Attachment and At-Risk Populations

In abusive, neglectful, or otherwise unstable families, the likelihood of establishing a secure attachment between mother and child decreases substantially (Page, 1999). Sociodemographic factors, such as poverty and living in single-parent homes, puts children at a greater risk for poor cognitive, emotional, and behavioral outcomes lasting into adulthood (Karoly et al., 2006). Because child development is, in part, dependent on caregiver responsiveness and temperament, caregivers' own histories of trauma (i.e. their own histories of ACEs) are major risk factors for forming insecure attachments to their children (Page, 1999; Weitzman & Cook, 1986). A parent who has experienced trauma imparts effects associated with that trauma—consciously or not—onto their child, creating a disorganized attachment between the two (Shemmings & Shemmings, 2011; Shemmings, Shemmings, & Cook, 2012). Trauma resulting from childhood maltreatment can manifest in feelings of depression, aggression, avoidance, low academic achievement, and/or health problems or substance abuse; all of which are exacerbated when low socioeconomic status is also a factor (Chartier et al., 2010; Felitti et al., 1998; Kreidler & Kurzawa, 2009). These same factors are common parental characteristics associated with child maltreatment; thus, the cycle of adverse childhood experiences repeating intergenerationally is established (Gilbert et al., 2009).

The impact of cumulative adverse experiences, due partly to inadequate parenting, increases the potential for high-risk behaviors that carry into adulthood (Appleyard et al., 2005; Dannerbeck, 2005; Shemmings et al., 2012). Conversely, a secure attachment is evidenced by a responsive and tender parenting style, which leads to healthy development (Ainsworth, 1985). Although maternal deprivation does not occur exclusively among members of at-risk populations, mothers in at-risk populations are predisposed to forming insecure attachments with their children. Fortunately, it is posited that our psychological profiles are malleable, so intervening with positive contextual factors, such as more attentive caregiving, can reduce the impact of early adverse experiences of children (Kreidler & Kurzawa, 2009; Weitzman & Cook, 1986).

4. Home Visiting Programs

Evidence based home visiting programs (EBHV) have been providing services to families with young children for decades (e.g., *The American Academy of Pediatrics*, 1998; Gomby, Culross, & Behrman, 1999; National Commission to Prevent Infant Mortality, 1989). These evidence-based programs, while universally recognized under the term ‘home visiting’, vary widely across model design (e.g., Guttentag et al., 2014; Krugman, Lane, & Walsh, 2007; Mikton & Butchart, 2009; Rubin, Lane, & Ludwig, 2001; Park, 2008) and cost of implementation (Aos, Lieb, Mayfield, Miller, & Pennucci, 2004; Dalziel & Segal, 2012). However, home visiting programs “are linked by their method of service delivery, their goal of helping children by helping the parents of those children, and their focus on younger children” (Sweet & Applebaum, 2004: p. 1435). By helping mothers learn supportive parenting techniques and build healthy coping skills, EBHV programs encourage stability in the home, and are considered a highly protective and preventative strategy for positive childhood outcomes (e.g., Black, Dubowitz, Krishnakumar, & Starr, 2007; Guttentag et al., 2014; Park, 2008).

While each EBHV program has its own specific eligibility requirements, there are elements of sociodemographic risk included in all target populations (Olds et al., 1998). This focus on need-based intervention is due, in part, to the intergenerational transmission of risk, including childhood adversity, associated with maternal psychosocial vulnerability (Bifulco et al., 2002). Specifically, high rates of adverse childhood experiences are linked to low parental education (34%), parental psychopathology (33%), parental marital conflict (23%), and poor parent-child relationship (16%) (Chartier et al., 2010). Mothers most vulnerable to these risk factors are able to learn valuable coping and response skills via participation in early intervention programs, and are subsequently more likely to foster and manage secure attachments to their infants, particularly if program enrollment occurs during pregnancy (Rubin et al., 2001). It is also important to address the issue of ACEs history in the mother. While mothers may be reluctant to share their childhood experiences in a legal or clinical setting, the more personal nature of home visitation could foster an environment of trust and safety. Participation in these types of programs holds “considerable promise for improving children’s life-course trajectories and for reducing health and developmental problems and associated costs to government and society” (Olds, Sadler, & Kitzman, 2007: p. 355).

Interventions through EBHV Programs

While Home Visiting programs are not the only option for reducing the occurrence of ACEs, they are one of the most feasible. It is important to note that mounting evidence has pointed to preventive programs, such as home visiting, as the most effective and cost beneficial in addressing child maltreatment (Kilburn & Karoly, 2008). The hope is that through intervention, both parents and children are able to stop the cycle of traumatic experiences during childhood:

Evidence for simple intergenerational continuity of adverse childhood is inconclusive. Parents' own difficult childhood experience is frequently counterbalanced by later protective factors such as support from a partner. Thus there appears to be no *necessary* link between a parents' own childhood experience and that experienced by their children (Bifulco et al., 2002: p. 1077).

In this way, it seems hopeful that intergenerational transmission of risk can be mitigated and that children raised in families served by EBHV programs are better equipped to make healthy choices in adulthood.

In multiple meta-analytic reviews, professional home visiting programs have emerged as one of the most effective preventive programs for child maltreatment, and remain one of the most well-researched interventions. Aos et al. (2004) monetized the benefits of home visiting, finding that evidence-based models of home visiting (i.e., NFP) have benefits that far outweigh the costs of implementation when measured against seven pre-defined outcomes, including reduced child abuse/neglect, educational achievement, and reduced crime.

5. Cost/Benefit Analysis

It has been estimated that the total lifetime cost of non-fatal child maltreatment can be up to \$210,000 per case, and up to \$1.3 million for a fatal case (Fang, Brown, Florence, & Mercy, 2012). This lifetime estimate takes into account short- and long-term health outcomes, productivity loss, child welfare and criminal justice costs, and special education costs. The total lifetime cost to society of all child maltreatment cases (based on a 2008 estimate of 579,000 cases per annum) is \$124 billion (Fang et al., 2012). This same study noted that this estimate may even undercut actual costs. The study limits "lifetime" to the ages between six and sixty-five and did not take into account all known ACE outcomes, and the number of cases used is static and based only on 2008 projections (Fang et al., 2012). Cost projections such as these highlight the necessity for early intervention and prevention programs for this high-risk population.

To address this issue, many cost-benefit analyses have been completed for early intervention programs, though it is important to note that not all are objective. For the purposes of this analysis, only home visiting programs with strict inclusion requirements will be considered. Furthermore, different studies estimate costs based on different criteria, which will be outlined in regards to each study.

Nurse Family Partnership (NFP) is one of the most rigorously evaluated home visiting programs in existing literature. Most cost-benefit analyses have focused on NFP because of the quality of empirical research supporting this program (Mikton & Butchart, 2009). NFP has a cohesive and structured program model that is designed specifically to address child health and parenting outcomes for first time, low income, at-risk mothers who are pregnant at the time of enrollment (Aos et al., 2004). In the literature, NFP is associated with having a positive impact on child achievement test scores and positive behaviors, as well as a re-

duction in child abuse reports, emergency room visits, and arrests by age 15 (Karoly et al., 2006). Reductions in these types of constructs lead to overall reductions in cost to the child welfare system, health care system, and criminal justice system. A 2012 meta-analytic review of EBHV programs that focused on outcomes of child maltreatment or injury/hospitalizations, found that the NFP program had a cost/benefit ratio range of \$1.05 to \$12.62, based on 2010 dollars (Dalziel & Segal, 2012). In this study, child maltreatment was determined by incidences of child death, substantiated maltreatment cases, self-reported instances of maltreatment, neglect, domestic violence, and out-of-home care placements.

Though the Parents as Teachers (PAT) and Early Head Start (EHS) home visiting programs are less rigorously studied, both programs have been positively linked to improved behavioral outcomes in children, improved academic performance, child's emotional health, and a reduction in child maltreatment constructs, such as hospitalizations and injuries (Karoly et al., 2006; Krugman et al., 2007). Though results are mixed, most home visiting studies find that the early intervention of home visiting can improve both short- and long-term outcomes for children who are at-risk of being maltreated by positively impacting not only the outcomes listed above, but perhaps most importantly, the mother-child relationship (e.g., Black et al., 2007; Guttentag et al., 2014; Karoly et al., 2006; Olds et al., 1998). The importance of a stable home environment and a secure, attentive caretaker as moderators of ACE outcomes is widely acknowledged and much of the success of home visiting programs is attributed to the abilities of these programs to impact the home environment and parental relationships with young children (e.g., Afifi & MacMillan, 2011; Black et al., 2007; Chartier et al., 2010; Dannerbeck, 2005; Guttentag et al., 2014; Olds et al., 1998; Page, 1999; Weitzman & Cook, 1986).

6. Practical and Policy Implications

Continued state and federal funding is essential to the maintenance and expansion of EBHV programs. Allocation of these monies allows for intervention, rather than treatment; an approach that would benefit a number of public health systems. To this end, a discussion regarding stakeholder interests is offered.

6.1. Stakeholders

Due to the breadth of fields affected by the occurrence and transmission of ACEs, it is no wonder that there are a diverse group of community stakeholders, ranging from mental health clinicians to legislative bodies, interested in the extant research on the subject. Research-based interest has also burgeoned since the publication of the original findings. Dissemination and implementation science has dedicated resources to improving mental health services through innovative methods, including home visiting programs (Schenwald & Hoagwood, 2001).

The long-term impact on community public health has resulted in numerous

themes being identified as important considerations to be made by invested parties:

Multiple system-related themes were discussed ... including (a) financing methods (e.g., funding, insurance), (b) interagency working relationships and collaborations (e.g., cross-system cooperation), (c) policies and practices of referral sources and payers, (d) access to services, (e) quality of service, and (f) research (e.g., applicability of findings) (Rodriguez, Southam-Gerow, O'Connor, & Allin, 2014: p. 869).

It is essential that stakeholder perspectives be taken into consideration when designing and implementing treatments, as improved outcomes across public health systems have the most potential for sustained change. In this way, research informs program design, which encourages parents to be engaged and motivated to provide the best possible care for themselves and their children (Olds et al., 2007). It is ultimately the change in parenting that will have the most profound effect on the amelioration of both children's and parent's experiences of trauma and the generational transmission of risk.

6.2. EBHV Program Results

Perhaps the most salient argument for the relevance of home visitation programs comes from the outcomes associated with family participation. Reviews of EBHV programs find that early intervention at the prenatal stage, high intensity intervention, and requiring high parental involvement are the most effective elements involved in protective strategies (Park, 2008). Improving child health and development via use of home visiting has been repeatedly advocated for in legislation (e.g., National Commission to Prevent Infant Mortality, 1989; U.S. Advisory Board on Child Abuse and Neglect, 1991; The American Academy of Pediatrics, 1998), which serves as an influential recommendation for continued state and federal support.

Being able to measure positive child health outcomes becomes especially important when assessing the benefits of participation for families considered to be high-risk for the experience of trauma or patterns of maltreatment. Studies of high intensity EBHV programs focused on at-risk families have found that these programs have positive impacts on maternal care, as demonstrated by increased maternal responsiveness, warmth/sensitivity toward the child, and maintaining focus on the child; subsequently improving the cognitive and social behavioral functioning of the child (Guttentag et al., 2014; Black et al., 2007). The interaction between home visitors and parents, and these same parents later interacting with their children, has a palliative effect on intergenerational risk of exposure to adverse childhood experiences.

7. Conclusion

While the occurrence of ACEs cannot fully be prevented, child resilience to mal-

treatment has been found to be strongly associated with family-level protective factors, suggesting that a supportive and stable home environment can promote active functioning among those experiencing childhood maltreatment (Afifi & MacMillan, 2011; Weitzman & Cook, 1986). These stable home environments have also shown that aspects of developmental environment can be identified in order to mitigate continued traumatic experiences. Once identified, transmission of specific types of traumatic experiences can be mitigated. “One of the challenges in the field is to tease apart such aspects to pin down possible mechanisms of risk transmission” (Bifulco et al., 2002: p. 1076). Increased interpersonal functioning between a mother and her child is beneficial in reducing the risk of negative outcomes associated with ACEs. The reality of ACEs is sobering; almost two decades after the original study, there are still a vast amount of unknowns associated with ACEs. Negative adult health outcomes, it seems, were just the tip of the iceberg. As the research expands, it is essential to approach the study of ACEs from as many perspectives as possible. In doing so, policy makers and clinicians alike will be better able to make informed decisions about prevention, intervention, and treatment strategies. As it relates to inter-generational transmission of risk, it becomes evident that early intervention is one of the best options for reducing the likelihood of childhood vulnerability.

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