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Adverse family experiences and flourishing amongst children ages 6–17 years: 2011/12 National Survey of Children's Health

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Abstract

Adverse Childhood Experiences (ACEs) are prevalent in the population and linked to various negative long-term health and social consequences. However, due to the retrospective nature of most studies on the topic, little is currently known regarding ACEs' immediate health impact. This study aims to provide insight into this area by examining the association between a new measurement, Adverse Family Experiences (AFEs), and flourishing amongst children ages 6–17 years in the United States. Data from the 2011/12 National Survey of Children's Health were analyzed. Adjusted prevalence ratios assessed flourishing by the number of AFEs (0 events versus 1, 2, 3/3+) controlling for individual/household characteristics. A sub-analysis examined characteristics of flourishing children ages 12–17 years with 3/3+ AFEs. The results showed children with 1 AFE (APR = 0.87; 95% CI = 0.83–0.91), 2 AFEs (0.74; 0.69–0.79), and 3/3+ AFEs (0.68; 0.62–0.72) were less likely to flourish compared to those without any AFEs. Sub-analysis of children ages 12–17 years with 3/3+ AFEs revealed a higher proportion of flourishing children volunteering, participating in extracurricular activities, and working for pay compared to those who did not flourish. Findings show significant differences in flourishing by number of AFEs and suggest that social connectedness may play a role in determining flourishing amongst children with 3/3+ AFEs. Furthermore, the results highlight the potential importance of identifying children with high AFE counts and helping them build resilience outside of the home.

Keywords

Adverse family experiences (AFEs); Adverse childhood experiences (ACEs); Flourishing; 2011/12 National Survey of Children's Health

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1. Introduction

Adverse Childhood Experiences (ACEs) are traumatic events that occur prior to the age of 18 years. Studies on the topic have shown that ACEs are prevalent, with approximately 10% of children reported to have been neglected or psychologically abused in high-income countries (Gilbert et al., 2009). These children, due to their exposure to ACEs, are at an elevated risk of developing behavioral and psychological problems such as depression, eating disorders, and substance abuse in adulthood (Chartier, Walker, & Naimark, 2010; Danese et al., 2009; Dube, Felitti, Dong, Giles, & Anda, 2003). Because of the broad range of long-term health and social consequences, ACEs have emerged as a serious public health issue.

Childhood adversity can transform into disease through a variety of mechanisms. A growing body of evidence highlights the disruptive effects of ACEs at both behavioral and social levels. For example, adolescents who have experienced multiple traumatic experiences in childhood are more likely to initiate alcohol consumption at a younger age and to report using alcohol as a way of coping with stress (Rothman, Edwards, Heeren, & Hingson, 2008). This increased tendency to adopt unhealthy coping behaviors may also explain why higher exposures to ACEs are associated with tobacco use, illicit drug abuse, promiscuity, and pathologic gambling (Anda et al., 1999; Anda et al., 2006; Felitti, 2009). In addition, a dose response has been described. An increasing number of ACEs among individuals is related to increasing risk of developing poorer coping skills compared to their counterparts with a lower number of ACEs (Mc Elroy & Hevey, 2014; Tanaka et al., 2008). The adoption of unhealthy lifestyles further exacerbates socioeconomic inequalities since adults with behavioral and psychological problems are at a higher risk of unemployment, homelessness, and incarceration (Shonkoff & Garner, 2012). Ultimately, an intergenerational cycle of toxic stress may be created, with maltreated individuals who grow up lacking social support and stability in their lives unable to reach their full potentials as adults, and then exposing their own children to the same ACEs they have faced growing up (Braveman & Barclay, 2009; Kahn, Brandt, & Whitaker, 2004; Shonkoff & Garner, 2012; Wickrama, Conger, Lorenz, & Jung, 2008).

In the 2011/12 NSCH, a measure of Adverse Family Experiences (AFEs) was developed to understand the potentially destructive events or circumstances children may face from a more contextual and environmental perspective. The list of AFEs includes items adopted from the original ACE scale as well as four new stressors. These new items include: 1) death of a parent, 2) witness/victim of neighborhood violence, 3) socioeconomic hardship, and 4) perceived discrimination. Together, these items broaden the framework for understanding toxic stress and reflect a focus on negative experiences that extend beyond direct abuse or neglect (Shonkoff & Garner, 2012). Despite the growing interest in understanding early childhood adversity and its influence on health later on in life, little is known as to whether stressors like AFEs have any immediate impact on the behavioral and social development of maltreated children. Understanding this relationship can help guide public health efforts in preventing the negative health outcomes associated with toxic stress.

Flourishing, or thriving, has been identified as a "building block" of positive wellbeing and can serve as a marker for behavioral and social wellbeing (Lippman, Moore, & McIntosh, 2011; Moore and Lippman, 2005). Aspects of flourishing within the period of infancy and toddlerhood include "healthy attachment relationships; curiosity and interest in learning; the ability to regain equilibrium after an upset; and expressions of joy or happiness"("Measures of flourishing," 2013). For older children, flourishing qualities include "personal attitudes or beliefs; positive interpersonal relationships; and task-related characteristics, such as diligence and initiative" (Lippman et al., 2011). These character strengths reflect positive youth development and promote the capacity to recover from the impact of adverse events (Moore and Lippman, 2005). Flourishing, as an outcome measure, may therefore serve as a possible mediator between AFEs and related health issues in adulthood.

The primary aim of this paper is to examine the relationship between AFEs and a child's ability to flourish.

2. Methods

2.1. Study population

Data from the 2011/12 NSCH were analyzed in 2013. The NSCH is a population based, cross-sectional, telephone survey administered by the Centers for Disease Control and Prevention's National Center of Health Statistics as a module of the State and Local Area Integrated Telephone Survey program. From February 2011 to June 2012, households with children under age 18 years were selected for the sample to provide estimates representative of children under age 18 years. Survey questions were asked of parents (or guardians) on several topics ranging from socio-demographics to age-specific developmental health status. The response rate was 23.0%. Detailed information on the complex, multi-cluster, probability sampling methodology is available online from the National Center for Health Statistics (Centers for Disease Control and Prevention, 2013; Initiative, 2014). This paper specifically focused on children ages 6–17 years.

2.2. AFE assessment

ACEs are stressful or traumatic experiences that occur prior to the age of 18 years. This variable was first collected in the original ACE study, an ongoing longitudinal study exploring whether childhood trauma is associated with elevated health, social, and economic risks amongst members of the San Diego, California Kaiser Health Plan (Anda et al., 2006; Felitti et al., 1998). Since then, many other surveys including the Behavioral Risk Factor Surveillance System (BRFSS) have used results from the original ACE study to guide the development of their own ACE assessment questions.

In the NSCH, a new measurement known as Adverse Family Experiences (AFEs) was developed. Items from the BRFSS ACE Module deemed appropriate for reporting by parents and guardians were incorporated. The NSCH created four additional questions specifically adapted to the survey population. These items included potentially destructive events or circumstances experienced during childhood that were more contextual and environmental. A Technical Expert Panel, consisting of experts in the field of survey methodology and

children's health, provided guidance on this process. Input from the community was also gathered through a public comment period before the finalization of the new assessment questions (CAHMI, 2013; Maternal and Child Health Bureau, 2010).

The AFE measurements in this survey used to capture risk factors affecting children include: socioeconomic hardship, divorce/separation of parent, death of parent, parent incarceration, witness of domestic violence, victim of neighborhood violence, lived with someone who was mentally ill or suicidal, lived with someone with alcohol/drug problem, and unfair treatment or judgment due to race/ethnicity.

The exact questions included in the survey were:

1. Since the child was born, how often has it been very hard to get by on your family's income—hard to cover the basics like food or housing? Would you say very often, somewhat often, often, rarely, or never?
2. Did the child ever live with a parent or guardian who got divorced or separated after the child was born?
3. Did the child ever live with a parent or guardian who died?
4. Did the child ever live with a parent or guardian who served time in jail or prison after the child was born?
5. Did the child ever see or hear any parents or adults in his/her home slap, hit, kick, punch, or beat each other up?
6. Was the child ever the victim of violence or witness any violence in his/her neighborhood?
7. Did the child ever live with anyone who was mentally ill or suicidal, or severely depressed for more than a couple of weeks?
8. Did the child ever live with anyone who had problems with alcohol or drugs?
9. Was the child ever treated or judged unfairly because of his/her race or ethnic group?

2.3. Flourishing assessment

There currently does not exist a standardized or validated scale to assess the concept of flourishing. Positive health items, "flourishing items", were included for the first time in the 2011/12 NSCH to provide information on the physical health, mental and emotional health, empathy, and resilience of children. A Technical Expert Panel conducted a systemic assessment of the flourishing concept and explored conceptual frameworks developed by researchers such as Child Trends. Through performing an iterative assessment as well as gathering input during a public comment period, the Technical Expert Panel finalized a set of items for this indicator (CAHMI, 2013; Moore, Murphey, & Bandy, 2012).

Three questions used to capture curiosity and discovery about learning, resilience, and self-regulation were asked for children ages 6–17 years. These questions included:

1. child shows interest and curiosity in learning new things
2. child stay calms and in control when faced with a challenge
3. child finishes tasks and follows through with plans

Parents indicated whether each was true of their child “never”, “rarely”, “sometimes”, “usually”, or “always” during the past month. In this paper, answers of “usually” or “always” were used to indicate that the child exhibited the particular positive indicator. Children were grouped according to whether they demonstrated 0–1, 2, or all 3 flourishing items. This grouping strategy combines reports of 0 or 1 flourishing items and reflects existing research detailing that a child’s wellbeing is not based on single attributes. Instead, wellbeing is a multi-dimensional construct that is best characterized by the demonstration of more than one aspect of positive individual functioning (Moore et al., 2012). The final analysis of this paper would therefore define flourishing to be the exhibition of all three flourishing indicators since this would be most representative of a flourishing child’s profile.

2.4. Statistical analysis

Prevalence estimates and 95% confidence intervals were calculated using sample weights to account for the complex sampling design of the NSCH. The examined population characteristics were age, sex of the child, race/ethnicity, and percent federal poverty level (%FPL).

Chi-square tests were performed to test for differences in flourishing across key variables (AFEs, age, sex, race/ethnicity, %FPL) variables. Adjusted prevalence ratios examining the relationship between AFEs and flourishing were calculated using log-binomial regression modeling. AFEs were examined as a four-level categorical variable. Flourishing was examined as a composite binomial variable. Specifically, the regression compared children with all three flourishing indicators to those with 2 or less. The covariates included in the fully adjusted model were age, sex, race/ethnicity, and %FPL.

A sub-analysis of children ages 12–17 years with 3 or more AFEs was performed to examine the characteristics of flourishing children. Specifically, the sub-analysis looked at the percentage of flourishing children with 3 or more AFEs involved in activities outside of the household to see whether this social engagement may help children with AFEs build resilience. The sub-analysis specifically assessed participation in volunteering, extracurricular activities, and paid work. These three areas are representative of the bridging, bonding, and linking aspects of social capital that have been detailed in existing literature to be important social determinants of health (Poortinga, 2012).

Estimated population and weighted percentages were calculated excluding missing values for independent and dependent variables. The initial sample size was 65,680 records representing 49,586,134 children nationwide. Of these records, 32 were missing information on flourishing and 793 were missing information on AFEs. An additional 889 records were missing information on the covariates of interest. After excluding the aforementioned records, the final sample size in the adjusted model was reduced to 63,966 records representing 48,083,668 children nationwide. For the sub-analysis, the sample size was

restricted to children ages 12–17 years with three or more AFEs and no missing values for variables of interest. This narrowed the sample size for volunteered within the past year to 5167 records, participated in extracurricular activities within the past year to 5179 records, and worked for pay within the past year to 5153 records. All data analyses were conducted using SAS (version 9.2) and SAS-callable SUDAAN (version 11.0) to account for the population weights and complex sample design.

3. Results

Over half of children ages 6–17 years (53.5%), were reported to have at least one AFE. Furthermore, 28.6% of the 53.5% had experienced 3 or more AFEs. Regarding flourishing, 47.7% of children were reported to demonstrate all three positive indicators (Table 1).

Significant differences in flourishing were observed across various population characteristics such as race, age, gender, and %FPL (Table 2). Non-Hispanic white children most frequently reported demonstrating all three flourishing indicators. A larger percentage of females compared to males were reported to display all three flourishing indicators (51.4% versus 44.1%). Finally, children in households at or above 400% of the Federal Poverty Level (FPL) were reported to have the highest prevalence of displaying all three flourishing indicators compared to children in households at lower FPL. These differences were statistically significant ($p < 0.01$).

Results from the log-binomial regression model show significant differences in flourishing by number of AFEs. After adjusting for age, race, sex, and %FPL, children with 1 AFE were 0.87 times as likely as children with no AFEs to be flourishing (95% CI: 0.83, 0.91). Children with 2 AFEs were 0.74 times as likely as children with no AFEs to be flourishing (95% CI: 0.69, 0.79). Lastly, children with 3 or more AFEs were 0.68 times as likely as children with no AFEs to be flourishing (95% CI: 0.62, 0.72) (Table 3).

Among children ages 12–17 years with 3 or more AFEs, a greater proportion of flourishing children volunteered, participated in extracurricular activities, and worked for pay within the last year (Table 4).

4. Discussion

Consistent with other findings on early childhood maltreatment, AFEs are common within the population and are related to negative social and behavioral development. The findings of this paper further add to this narrative by suggesting that the consequences of these developmental changes can occur early in life. Specifically, AFEs are associated with the lower likelihood of flourishing among children ages 6–17 years.

The implications of decreased flourishing among children with AFEs are manifold. In this paper, flourishing encompassed three areas: the capability to remain in control when challenged, interest in learning new things, and ability to follow through with plans. These characteristics are essential components of a child's wellbeing and an inability to demonstrate these qualities may have consequences perpetuating into adulthood. For example, a lack of interest in learning and inability to follow through with plans may hinder

a child's ability to succeed academically, thereby leading to the diminished economic productivity commonly associated with limited educational attainment (Case, Fertig, & Paxson, 2005; Graff-Radford et al., 2006; Heckman, 2008; Heckman, Stixrud, & Urzua, 2006). A child's reduced capacity to remain in control when faced with a challenge, on the other hand, is an early sign of maladaptive coping behavior. When left unaddressed, these early maladaptive coping behaviors can manifest into the mental health issues and risky behaviors commonly observed in adults who have a history of early childhood adversity (Anda et al., 2006; Shonkoff & Garner, 2012).

The graded relationship between number of AFEs and decreased likelihood of flourishing is consistent with studies highlighting the cumulative effects of adverse treatment. In general, AFEs typically occur in clusters. A child with one AFE, for example, is likely to be exposed to the same stressor repeatedly or to other adverse experiences before they reach adulthood (Dong et al., 2004). This repeated stress places the body's neurobiological stress management systems into a persistent state of overdrive. The constant activation affects numerous pathways in the developing brain responsible for functions such as emotional regulation and aggression (Anda, 2009). The diathesis stress model further expands on this idea. After initial exposure to stressors, every additional exposure decreases an individual's overall stress threshold. The required severity of the next stressor to reduce wellbeing is lowered (Mc Elroy & Hevey, 2014). The accumulation of stressors, combined with an increased susceptibility to its effects, creates a monumental barrier preventing children from being able to reach their full developmental potential.

Despite the association between AFEs and difficulties in positive development, children with AFEs were still able to flourish. Approximately one in three children with 3 or more AFEs were reported to be flourishing. The sub-analysis of children with 3 or more AFEs show that a greater percentage of flourishing children in this group were participating in engaging opportunities outside of the home compared to those with the same AFE count who were not flourishing. This finding suggests that participation in extracurricular activities, volunteering, and working may be providing alternative means for children to establish positive roles and relationships. Previous research exploring the social determinants of health has noted the importance of social patterns in influencing a child's health trajectory. For example, there is an association between participation in school-related extracurricular activities and a lower likelihood of suicide amongst youth (Viner et al., 2012). Positive social connections appear to help youth define individual identities, provide them with a sense of belonging and attachment, and offer important opportunities to learn healthy adaptive responses to adverse experiences (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999; Resnick et al., 1997; Shonkoff & Garner, 2012). In turn, the adoption of these positive coping behaviors contributes to long-term resilience, which may reduce the risk of developing adverse health outcomes such as mental illness and decrease the potential for long-term associated impacts.

Several limitations in the data exist. Survey data for the NSCH were collected in a cross-sectional manner, therefore preventing temporality from being established. AFEs may not have necessarily occurred before the development of certain flourishing behaviors. Additionally, this study looked at total AFE counts to explore the cumulative stressor effect

of AFEs on human development. Since certain AFEs may have greater long-term impact than others, future analyses may consider examining the impact of each AFE individually to account for these differences. Finally, AFEs information was based on parental report. Issues regarding social desirability may arise since parents may be less inclined to honestly report all incidences of AFEs within the household. This potential underreporting may underestimate the magnitude of association between AFE counts and flourishing. Nonetheless, measuring childhood adversities during childhood as opposed to later on in life allows for the opportunity to evaluate the immediate health outcomes associated with AFEs.

Another limitation is that the flourishing indicator only captured a few components of positive behavioral functioning. Other characteristics such as educational achievement, positive friendships, and healthy lifestyle habits have also been recognized in existing literature as important indicators of healthy development (Lippman et al., 2011). However due to the nature of the NSCH, information regarding these aspects of flourishing was unavailable. Future research can expand on the current definition of flourishing, provide a more comprehensive conceptualization of child wellbeing, and establish a standardized approach to measure positive health indicators.

Lastly, the results of the sub-analysis, although encouraging, should be interpreted with caution. A larger percentage of flourishing children with 3/3+ AFEs were engaged in activities outside of their homes and schools compared to their non-flourishing counterparts. Further investigation, however, is necessary to clarify if extracurricular activities are responsible for the development of flourishing qualities or if certain children are more inclined to participate in these activities regardless of AFEs. Existing research has discussed the innate capacity for individuals to adapt and thrive despite risk and adversity. Furthermore, those who are more resilient often seek opportunities that place themselves in healthier contexts (Masten, 2001). Evaluating the impact of activities outside of homes and schools, as perceived by the children, may provide further insight into this relationship.

This study, despite its limitations, adds to a growing body of evidence highlighting the importance of positive health outcomes. Furthermore, the study's use of nationally representative data demonstrates that the utility of positive health outcomes extends beyond smaller studies and is applicable to large-scale population-based research as well. Rather than focusing on the diseased state, looking at positive health indicators among at risk youth can provide another perspective as to how early life stressors affect an individual's overall wellbeing. As a whole, the findings of this paper are consistent with the current understanding of toxic stress. Children who grow up in the absence of negative early experiences are more likely to exhibit the positive behavioral functioning necessary for a lifetime of physical and mental vitality (Shonkoff & Garner, 2012). By identifying children with high AFE counts, it may be possible to focus help for them to build resilience outside of the home. Implementation of family intervention strategies like home visitation and parenting training are other strategies to promote positive early childhood development for these at-risk children. Together, these approaches may further advance public health efforts in understanding toxic stress and preventing the onset of negative health outcomes associated with early life stressors.

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Table 1

Population Characteristics: 2011/12 National Survey of Children's Health (NSCH) – N = 65,680[a].

Variables	Respondents (n)	Weighted Percent Estimate (%)	95% Confidence Interval
Demographics			
Race			
White, non-Hispanic	43,153	53.7	(52.8, 54.6)
Black, non-Hispanic	6177	14.2	(13.6, 14.8)
Hispanic	8073	22.3	(21.4, 23.2)
Multiracial/Other	6712	9.7	(9.2, 10.3)
Age			
6–11 Years	31,078	49.4	(48.5, 50.2)
12–17 Years	34,601	50.1	(49.8, 51.5)
Gender			
Male	33,986	51.2	(50.3, 52.1)
Female	31,067	48.8	(47.9, 50.0)
% Federal Poverty Level			
< 100%	9135	20.7	(19.9, 21.4)
100%–199%	11,449	21.4	(20.7, 22.2)
200%–399%	20,329	28.9	(28.1, 29.6)
400%+	24,767	29.1	(28.3, 29.8)
AFE			
0 AFEs	33,718	46.6	(25.7, 47.5)
1 AFE	15,526	25.9	(25.1, 26.7)
2 AFEs	7026	12.3	(11.7, 12.9)
3 or more AFEs	8609	15.3	(14.6, 15.9)
Flourishing			
0–1 Positive Indicators	15,592	25.6	(24.8, 26.4)
2 Positive Indicators	17,190	26.8	(26.0, 27.5)
All 3 Positive Indicators	32,866	47.7	(46.8, 48.5)

[a]Based on individuals with no missing values for age variable.

Table 2

Population Characteristics by Flourishing: 2011/12 National Survey of Children's Health (NSCH) – N = 65,680[a].

Variables	Number of Positive Health Characteristics			
	0–1 Items	2 Items	All 3 Items	p-value*
Demographics				
AFE				< 0.001
0 AFEs	19.0	25.6	55.4	
1 AFE	26.5	27.2	46.3	
2 AFEs	32.3	29.4	38.3	
3 or more AFEs	38.8	27.2	34.0	
Race				< 0.001
White, non-Hispanic	23.0	26.1	50.9	
Black, non-Hispanic	35.6	27.9	36.6	
Hispanic	25.6	27.6	46.8	
Multiracial/Other	25.0	26.3	48.8	
Age				< 0.001
6–11 Years	25.1	27.1	47.8	
12–17 Years	26.0	26.5	47.5	
Gender				< 0.001
Male	29.0	26.9	44.1	
Female	21.9	26.6	51.4	
% Federal Poverty Level				
< 100%	34.0	29.1	36.9	< 0.001
100%–199%	27.7	26.7	45.6	
200%–399%	24.1	27.6	48.2	
400%+	19.5	24.2	56.3	

[a]Based on individuals with no missing values for age variable.

*Significant p-value < 0.05.

Table 3

Prevalence Ratio (PR) and 95% Confidence Interval (CI) for the Association Between Flourishing[a] and Adverse Family Experiences (AFE) Count – n = 63,966[b].

AFE	Unadjusted PR (CI)	Fully-Adjusted[c] PR (CI)
AFE Count		
0	1.0 (reference)	1.0 (reference)
1	0.84 (0.80, 0.87)	0.87 (0.83, 0.91)
2	0.69 (0.65, 0.74)	0.74 (0.69, 0.79)
3 or more	0.61 (0.57, 0.66)	0.68 (0.62, 0.72)

[a] Flourishing defined as demonstration of all three flourishing indicators.

[b] Based on individuals with no missing values for variables of interest.

[c] Fully-adjusted: Adjusted for age, gender, race/ethnicity, % federal poverty level.

Table 4

Relationship of Social Connectedness Characteristics and Flourishing Among Children Ages 12–17 Years with Three or More AFEs[a].

	Flourishing Children% (CI)	Not Flourishing Children% (CI)	Sample Size[a]
Activity			
Volunteered within the past year	80.4 (76.4, 84.1)	67.2 (63.8, 70.4)	n = 5167
Participated in extracurricular activities within the past year	82.9 (78.9, 86.3)	75.0 (71.9, 77.9)	n = 5179
Worked for pay within the past year	39.0 (33.9, 44.3)	24.2 (21.6, 27.0)	n = 5153

[a]Based on individuals with no missing values for variables of interest.