



Published in final edited form as:

*Am J Geriatr Psychiatry*. 2015 January ; 23(1): 110–114. doi:10.1016/j.jagp.2014.08.014.

## Adverse Childhood Experiences and Geriatric Depression: Results from the 2010 BRFSS

Margaret A. Ege, MD<sup>1</sup>, Erick Messias, MD, MPH, PhD<sup>1</sup>, Puru Thapa, MD<sup>1,2</sup>, and Lewis P. Krain, MD<sup>1</sup>

<sup>1</sup>University of Arkansas for Medical Sciences, Department of Psychiatry

<sup>2</sup>Arkansas State Hospital

### Abstract

**Introduction**—Adverse childhood experiences (ACEs), including physical, sexual, and emotional abuse, have been shown to result in a variety of poor outcomes including depression. The majority of research has examined the impact of such events on adolescents and young adults leaving a dearth of information regarding how these events may affect depressive symptom point prevalence later in life.

**Methods**—Data from the CDC's 2010 Behavioral Risk Factor Surveillance Survey (BRFSS) were used to estimate the point prevalence of depression in individuals sixty years of age and greater based on presence or absence of certain ACEs. Depressive symptoms were assessed using eight items from the Patient Health Questionnaire (PHQ). Subjects with a PHQ score of 10 or greater were categorized as depressed. Six different types of ACE were included in the study: parents being physically abusive to each other, being physically harmed by a parent, being sworn at by the parent, being touched sexually by an adult, being forced to sexually touch an adult, and being forced into a sexual encounter. ACEs were categorized as never, single if subject reported it occurring once, or repeated if subject reported multiple episodes.

**Results**—The study sample consisted of 8,051 adults aged 60 years and greater who responded to questions about adverse childhood experiences. The study sample was comprised of 53% females, 83% Caucasians, and had a mean age of 70.4 years. After controlling for age, gender, and race, depression was significantly correlated with repeated ACEs of all types (adjusted odds ratio [AOR] ranging from 2.41 to 9.78, all statistically significant). The only ACE where a single occurrence was significantly associated with late life depression was forced sexual intercourse (AOR 2.92, 95% C.I. 1.06-8.02). After controlling for all types of abuse in a single model, repeated physical abuse and repeated forced sexual intercourse remained significant (AOR 2.94, 95% C.I. 1.68-5.13, and AOR 3.66, 95% C.I. 1.01-13.2, respectively).

---

© 2014 American Association for Geriatric Psychiatry. All rights reserved.

Corresponding author: Erick Messias, MD, MPH, PhD, University of Arkansas for Medical Sciences, 4301 W Markham St Slot #568, Little Rock, AR, 72205-7199, emessias@gmail.com.

No Disclosures to Report

**Publisher's Disclaimer:** This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Discussion**—These results indicate a significant association between repeated ACE and depression in older adults. When controlling for all forms of abuse, the repeated physical abuse and forced sexual intercourse are significantly correlated with late life depression. It emphasizes the need to continue developing techniques to help individuals with a history of ACE in order to decrease their negative effects, not only immediately, but also later in life.

---

## Introduction

Adverse childhood experiences (ACEs) have been associated with many negative outcomes throughout life, both physical and mental. Physically, early stress has been associated with increased fatigue in middle age and obesity in adulthood<sup>1</sup>. Psychiatrically, ACEs have been associated with an increase of nicotine and alcohol dependence, personality disorders, and anxiety disorders in adults as well as suicidal ideation and behaviors in adolescence<sup>2,3</sup>. ACEs have been categorized into three forms: emotional, physical, and sexual. Each has been the focus of multiple studies and linked to some degree with the subsequent development of depression among teens and young adults<sup>4</sup>.

These findings are not universal throughout the literature. For instance, one study has found that while emotional abuse was associated with adult depression, neither sexual nor physical abuse was<sup>4</sup>. Additionally, some adversity may be helpful for people; compared to either no adversity or high levels of adversity, a low to moderate level was associated with better mental health, possibly due to resilience<sup>5</sup>.

There remains limited research on the effects of ACEs in older adults. One study found an increased risk of suicidal ideation in older women admitted to a psychiatric unit if they had a history of childhood sexual abuse<sup>6</sup>. Individuals who have had adversities in childhood tend to have less adaptive functioning when they age compared to their peers<sup>7</sup>. Several studies show that emotional abuse in childhood is associated, in those aged 60 years and greater, with difficulty developing social support, increased emotional distress, and poor sleep quality. These findings suggest that various types of abuse may impact mental health in older adults; however, it does not directly answer the question of the effects of ACEs on geriatric depression prevalence. It is this question we seek to answer.

We hypothesized that emotional abuse would be more likely to impact depression and that repetitive abuse of either type would have a higher impact. We hypothesized that any level of sexual abuse would be associated with increased levels of depression, with chronic sexual abuse having the highest association.

## Methods

### Sample

This study utilizes data from the 2010 Behavioral Risk Factor Surveillance System (BRFSS), available at the Centers for Disease Control and Prevention (CDC) website. The BRFSS consists of a randomly selected, nationally representative group of participants interviewed via telephone. The surveys consist of three main types: a fixed core of questions asked of all participants, optional modules states may add if desired, and state-added

questions. Complete information about the survey may be found at the CDC's website at [www.cdc.gov/brfss](http://www.cdc.gov/brfss). In 2010, 4 states (Hawaii, Nevada, Vermont, and Wisconsin) asked both the depression screening and the ACE questions, such as physical and sexual abuse in childhood, and were included in analysis.

## Questions

The depression screening questions were drawn from the Patient Health Questionnaire eight-item scale (PHQ-8). The PHQ-8 assesses symptoms of depression as well as level of impairment from the perspective of the participant. The items are rated on a scale from 0 (not at all) to 3 (nearly every day) for a total of 24 possible points with higher scores indicating more severe symptoms. The PHQ-8 has been studied in the context of the BRFSS and found to have a sensitivity and specificity for major depressive disorder of 100% and 95% respectively<sup>8</sup>. For the purposes of this study, a cut-off score of 10 or greater was utilized to categorize participants as depressed versus non-depressed, which has good sensitivity, 88%, and specificity, 88%, and a positive likelihood ratio of 7.1<sup>8</sup> on the PHQ-9 (includes a question regarding suicidal ideation). The exclusion of the suicidal ideation question (PHQ-8) does not significantly impact the prevalence of depressive symptoms found.

ACEs were assessed with several questions. Episodes of abuse were categorized as never, once, or more than once. Six different types of ACEs were examined which are as follows: parents being physically abusive to each other, being physically harmed by a parent, being sworn at by the parent, being touched sexually by an adult, being forced to sexually touch an adult, and being forced into intercourse. The questions asked are as follows: "How often did your parents or adults in your home ever slap, hit, kick, punch or beat each other up," "Before age 18, how often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include spanking," "How often did a parent or adult in your home ever swear at you, insult you, or put you down," "How often did anyone at least 5 years older than you or an adult, ever touch you sexually," "How often did anyone at least 5 years older than you or an adult, try to make you touch them sexually," and "How often did anyone at least 5 years older than you or an adult, force you to have sex."

## Analyses

Analyses were performed using STATA 11. Data was weighted with the provided population weights, and sampling units, using Taylor approximation; and represent a best estimate of point prevalence and associations in the population.

## Results

Our sample was comprised of 8,051 individuals aged 60 years and greater who completed questions regarding depression and ACEs. Their demographics are represented in Table 1. As noted in the table, there are significant differences between the depressed and non-depressed groups in terms of race and number of ACEs, with no differences on gender or age.

Table 2 notes the point prevalence of depression, the crude odds ratio, and the odds ratio adjusted for gender, age, and race. Both prior to and after controlling for age, gender, and race, only one ACE scenario (forced sex) resulted in a statistically significant change in point prevalence of depression after a single episode. The greatest increase from the baseline depression occurred in the group endorsing multiple episodes of forced sexual intercourse. When any ACE occurred on a repeated basis, however, significant changes were seen in depression point prevalence across all types of abuse. Once all ACEs are included in a single model, significance remains only for repetitive physical abuse and repeated forced intercourse (see Table 2 for statistics).

## Discussion

In a large community sample of subjects 60 years or older, we found that depression point prevalence is significantly higher among those reporting repeated ACEs of any type. Overall, a onetime ACE is not significantly related to an increased point prevalence of depression in older adults, the one exception being forced sex, where one occurrence is enough to increase the point prevalence of depression. When all ACEs are included in one single model, significance is noted only for repeated acts of physical abuse and forced sexual intercourse.

This study has limitations. First, the history of ACE is based on self-report, which may lead to recall bias, particularly when the events happened many years previously. It is possible that those with depression may recall these negative events more than those without. Second, depression categorization was made on current symptom report rather than a clinical diagnosis.

In terms of study limitations, a review on recall bias effects concludes that in retrospective studies the occurrence of ACE are likely to be underreported. They also add that should there be a bias, it does not appear to be secondary to the effects of mood<sup>9</sup>. Second, if a person were being adequately treated for depression with resultant symptom control, it is possible that a person with depression would not meet our cut-off; if this is the case, it could strengthen our findings.

Our finding, that repeated ACEs are associated with a higher point prevalence of depression later in life, most notably with physical abuse and forced sexual intercourse, is in line with other studies. A 2008 study found that individuals subjected to childhood physical or sexual abuse had a greater risk for poor mental and physical health in older age though unlike our study the participants were not a community sample<sup>10</sup>. Our study largely supported these findings, particularly prior to controlling for all forms of abuse. The BRFSS questions did not specifically assess for number of perpetrators.

With its focus on the geriatric population of the United States, this study enriches the current knowledge of the effects of ACEs on geriatric depression and examines each of the three forms of abuse identified in the ACE literature. The results of this study emphasize the importance that remote events may have in the development or persistence of depression and the need for screening of both ACEs and depression across the lifespan due to their high

prevalence and high correlation, hopefully leading to the development of early intervention to minimize their morbidity and mortality effects.

## References

1. Cho HJ, Bower JE, Kiefe CI, Seeman TE, Irwin MR. Early life stress and inflammatory mechanisms of fatigue in the Coronary Artery Risk Development in Young Adults (CARDIA) study. *Brain, behavior, and immunity*. Aug; 2012 26(6):859–865.
2. Elliott JC, Stohl M, Wall MM, et al. The risk for persistent adult alcohol and nicotine dependence: the role of childhood maltreatment. *Addiction*. May; 2014 109(5):842–850. [PubMed: 24401044]
3. Raposo SM, Mackenzie CS, Henriksen CA, Afifi TO. Time Does Not Heal All Wounds: Older Adults Who Experienced Childhood Adversities Have Higher Odds of Mood, Anxiety, and Personality Disorders. *The American journal of geriatric psychiatry : official journal of the American Association for Geriatric Psychiatry*. Sep 5.2013
4. Jaffee SR, Moffitt TE, Caspi A, Fombonne E, Poulton R, Martin J. Differences in early childhood risk factors for juvenile-onset and adult-onset depression. *Arch Gen Psychiatry*. Mar; 2002 59(3): 215–222. [PubMed: 11879158]
5. Seery MD. Resilience: A Silver Lining to Experiencing Adverse Life Events? *Curr Dir Psychol Sci*. Dec; 2011 20(6):390–394.
6. Talbot NL, Duberstein PR, Cox C, Denning D, Conwell Y. Preliminary report on childhood sexual abuse, suicidal ideation, and suicide attempts among middle-aged and older depressed women. *Am J Geriatr Psychiat*. Sep-Oct;2004 12(5):536–538.
7. Wilson RS, Krueger KR, Arnold SE, et al. Childhood adversity and psychosocial adjustment in old age. *Am J Geriatr Psychiat*. Apr; 2006 14(4):307–315.
8. Kroenke K, Strine TW, Spitzer RL, Williams JBW, Berry JT, Mokdad AH. The PHQ-8 as a measure of current depression in the general population. *Journal of affective disorders*. Apr; 2009 114(1-3):163–173. [PubMed: 18752852]
9. Hardt J, Rutter M. Validity of adult retrospective reports of adverse childhood experiences: review of the evidence. *Journal of Child Psychology and Psychiatry*. Feb; 2004 45(2):260–273. [PubMed: 14982240]
10. Draper B, Pfaff JJ, Pirkis J, et al. Long-term effects of childhood abuse on the quality of life and health of older people: Results from the depression and early prevention of suicide in general practice project. *J Am Geriatr Soc*. Feb; 2008 56(2):262–271. [PubMed: 18031482]

Table 1

Sample description for 2010 BRFSS participants over age 60 included in the analysis (N=8051)

	Non Depressed N=7617	Depressed N=434	Total N=8051	Test statistics and p value *
<b>% Female</b>	53% (51-55)	58% (49-67)	53% (51-55)	Design-based F (1,8008)=0.96, p<0.33
<b>Race</b>				Design-based F (2.8, 21753)=2.7 p=0.047 ***
Caucasian	84% (82-85)	74% (64-82)	83% (82-84)	
African-American	2% (1-2)	2% (0-5)	2% (1-2)	
Hispanic	2% (2-3)	6% (2-14)	3% (2-3)	
Other	12% (12-13)	18% (11-28)	13% (12-14)	
<b>Age</b>				Design-based F (3.9, 31246) = 1.8, p=0.12
60-64	31% (29-33)	40% (31-49)	31% (30-33)	
65-69	22% (20-23)	23% (17-31)	22% (20-23)	
70-74	17% (15-18)	16% (11-23)	17% (15-18)	
75-79	15% (14-17)	10% (6-1)	15% (14-17)	
80+	16% (14-17)	12% (7-18)	15% (14-17)	
<b>Number of Adverse Childhood Experiences</b>				Design-based F (1.99, 15963)=27.4, p<0.001 ***
zero	76% (74-78)	54% (45-63)	75% (73-76)	
1	14% (13-16)	16% (11-23)	14% (13-16)	
More than 1	10% (9-11)	30% (23-38)	11% (10-12)	

\* Design-based F is a corrected, weighted, Pearson chi square statistic; in order to get a valid p-value, the chi square statistic is converted to an F statistic accounting for the complex sampling design.

\*\* On post hoc logic regression race categories African American, Hispanic, and Other had a statistically significant higher prevalence of depression compared to Caucasian.

\*\*\* On post hoc logistic regression having "more than 1 ACE" had a statistically significant higher depression prevalence compared to having zero ACE – while reporting one ACE was not.

Table 2

Association between type and frequency of ACEs and Geriatric Depression

	Total (N)	% Depressed (95% C.I.)	Crude Odds Ratio (95% C.I.)	Adjusted Odds Ratio* (95% C.I.)	Full Model**
Parents beat each other	Never	4.7% (3.9-5.7)	-	-	-
	Once	9.3% (4.2-19.1)	2.05 (0.86-4.87)	1.95 (0.9-4.21)	1.47 (0.6-3.57)
	More than once	12.5% (8.7-17.7)	2.89 (1.83-4.54)	<b>2.69 (1.7-4.8)</b>	1.32 (0.65-2.69)
Parents physically hurt you	Never	4.3% (3.5-5.3)	-	-	-
	Once	7.7% (3.5-16)	1.85 (0.78-4.37)	1.98 (0.83-4.73)	1.58 (0.58-4.27)
	More than once	17.1% (12.8-22.6)	4.59 (3.06-6.87)	<b>4.55 (3.05-6.77)</b>	<b>2.94 (1.68-5.13)</b>
Parents swore at you	Never	4.4% (3.5-5.5)	-	-	-
	Once	5.5% (2.2-12.8)	1.26 (0.48-3.31)	1.26 (0.51-3.08)	1.11 (0.45-2.73)
	More than once	10.2% (8-13.1)	2.49 (1.74-3.58)	<b>2.41 (1.68-3.45)</b>	1.11 (0.69-1.76)
Someone touched you sexually	Never	4.9% (4-5.8)	-	-	-
	Once	9.4% (5-17.1)	2.04 (1-4.17)	1.63 (0.77-3.44)	1.17 (0.54-2.5)
	More than once	18.2% (11.8-27)	4.36 (2.53-7.52)	<b>3.93 (2.27-6.8)</b>	0.9 (0.38-2.1)
Someone made you touch them sexually	Never	5% (4.2-6)	-	-	-
	Once	9.5% (3.5-23.4)	1.97 (0.65-5.84)	1.86 (0.61-5.69)	1.33 (0.44-3.97)
	More than once	23% (14.1-35.4)	5.63 (2.99-10.6)	<b>5.18 (2.91-9.22)</b>	1.87 (0.5-7.02)
Forced to have sex	Never	5.1% (4.3-6.1)	-	-	-
	Once	13.7% (5.7-29.5)	2.96 (1.11-7.89)	<b>2.92 (1.06-8.02)</b>	1.68 (0.49-5.8)
	More than once	35.2% (22.4-50.6)	10.12 (5.22-19.62)	<b>9.78 (4.58-20.9)</b>	<b>3.66 (1.01-13.2)</b>

\* Adjusted for age, gender, and race using logistic regression.

\*\* Adjusted for age, gender, race, and other ACEs using logistic regression.