

Adverse Childhood Experiences, Other Psychosocial Sources of Adversity, and Quality of Life in Vulnerable Primary Care Patients

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Perm J 2020;24:18.277

E-pub: 12/11/2019

<https://doi.org/10.7812/TPP/18.277>

ABSTRACT

Introduction: Adults who had adverse childhood experiences (ACEs) have increased risk of negative health outcomes. Despite the prevalence of ACEs, literature is scarce on quality of life (QOL) and ACEs in disadvantaged primary care populations.

Objective: To examine the prevalence of ACEs and association with chronic health problems and QOL in disadvantaged primary care patients in Oklahoma.

Methods: During a primary care visit, adults completed a questionnaire measuring demographics, ACEs, current health status and well-being, sources of support and adversity, and QOL. A physician investigator reviewed participants' health records, recording the incidence of 32 diagnoses commonly associated with chronic health problems.

Results: The survey was completed by 354 patients. Forty-three percent received disability benefits and 71% were unemployed. More than 37% reported 4 or more ACEs, and 35.5% had 0 or 1 ACE. The amount of health problems ranged from 0 to 11 and increased with the number of reported ACEs. The mean number of health problems for each ACE level was as follows: ACEs 0 to 1 had 3.01 problems (95% confidence interval = 2.96-3.88), ACEs 2 to 3 had 3.42 problems (95% confidence interval = 2.96-3.88), and ACEs 4 and above had 4.18 problems (95% confidence interval = 3.72-4.64). ACEs were significantly related to QOL.

Conclusion: This disadvantaged primary care population had high numbers of ACEs. ACEs correlated with increasing numbers of health problems and worse QOL. Enhanced awareness and action are needed to reduce health disparities and improve outcomes in similar populations.

INTRODUCTION

Adverse childhood experiences (ACEs) have been consistently linked with negative adult health outcomes across populations and geographical locations.¹⁻⁴ ACEs are 10 common, although typically unrecognized, categories of childhood trauma that have a dose-response relationship with common adult health concerns seen in primary care, including health risk behaviors, chronic disease, and mental illness. Categories of ACEs are verbal abuse, physical abuse, emotional neglect, physical neglect, sexual abuse, parental separation or divorce, witnessing domestic violence, substance abuse by a household member, household mental illness, and incarceration of a member of the household.

The seminal ACE study¹ reported results from more than 17,000 patients at a health maintenance organization; more than half of patients reported at least 1 ACE and one-fourth reported at least 2 ACEs. Although ACEs are common chronic life stressors, they are not routinely identified by adult primary care clinicians. Vulnerable patient populations are differentially

affected by ACEs and health problems, as well as other adverse social determinants of health in adulthood (eg, economic and material hardship, and safety concerns).^{5,6} Relative to other health outcomes, fewer studies have looked at the impact of ACEs on health-related quality of life (QOL) in adults.^{7,8} Moreover, although QOL and ACEs have been studied in a community-based sample,^{7,8} our study is the first of which we are aware to report on QOL and ACEs in a disadvantaged primary care population.⁹

Given the prevalence of ACEs, interventions for ACE-affected patients and training programs for primary care health practitioners are needed.¹⁰ Moreover, further analyses of the association of a history of ACEs with chronic health conditions and the impact on QOL in primary care adult populations are warranted, particularly among vulnerable patient populations, which many training programs serve. This knowledge will better inform training programs and interventions aimed at these populations.

The goals of our study were to explore ACEs in a population of patients in academic primary care clinics to 1) compare the prevalence of ACEs with national data; 2) assess the relationship between ACEs and chronic health conditions; and 3) explore the associations between QOL, ACEs, and concurrent adversity in disadvantaged adults in primary care.

METHODS

This cross-sectional study was conducted at 3 adult primary care clinics serving primarily Medicaid, Medicare, or uninsured patients in the same urban location and in the same university system, the University of Oklahoma (OU) School of Community Medicine. Internal medicine, family medicine, and community health patients completed a standardized questionnaire while in the clinic for a scheduled medical visit. The OU School of Community Medicine Community Health clinic is a specialized clinic within the Family Medicine Department that serves uninsured patients. Patients who were age 18 years or older were eligible to participate in the study. Written informed consent was obtained from participants before enrollment in the study, which was approved by the OU Health Sciences Center institutional review board. During the course of 2 months, graduate research assistants approached adult patients in the waiting room of regularly

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Keywords: adult health, adverse childhood experiences, childhood adversity, primary care, quality of life

scheduled primary care appointments to determine interest and eligibility in participating in this study. Participants were given the opportunity to complete the questionnaire themselves or to be interviewed by a research assistant. Spanish speakers were accommodated with a Spanish-language questionnaire and an interpreter, if necessary. Participants typically chose to start the 100-item questionnaire while in the waiting room and were encouraged to complete the survey after being placed in an examining room while waiting for the physician to begin his/her examination. Research assistants left the room during the physician encounter but were available to assist patients throughout the individual data collection process. Occasionally participants required using multiple instances of downtime during their appointment to complete the survey. Survey completion took about 20 to 30 minutes in most cases.

Refusals to participate were not formally tracked; eligible participants rarely refused. Anecdotally, refusals typically occurred because of lack of time or unwillingness to discuss sensitive information. In particular, a handful of patients did not want to share personal information relating to questions about safety (having weapons in the home) or relating to their experience of trauma in their childhood.

Outcome Measures

Measures included QOL (8 items based on the 36-item Short Form Health Survey of the RAND Medical Outcomes Study¹¹) assessing overall health, pain, energy, and physical and emotional health limitations on physical and daily activities); ACEs (10 items based on the Centers for Disease Control and Prevention-Kaiser Permanente [KP] ACE Study survey¹); health literacy (a single item rating confidence filling out medical forms^{12,13}); material hardship (eg, utilities disconnected, household in disrepair¹⁴); community problems (eg, crime, run-down properties, lack of jobs); social support (the emotional/informational support scale of the RAND Medical Outcomes Study¹⁵); health care barriers (8 items, eg, medical debt⁵); food assistance (a single item regarding Supplemental Nutrition Assistance Program benefits); intimate partner violence (IPV; 6 items assessing current physical, sexual, emotional abuse^{16,17}); and demographic characteristics. A review of survey respondents' medical records was conducted by a physician investigator, who was blinded to ACE scores, to code for risk factors and chronic health problems. Thirty-two separate diagnoses were selected for study: 22 medical conditions (eg, diabetes, chronic obstructive pulmonary disease, arthritis) and 10 mental health and substance abuse problems (eg, depression, anxiety, alcohol and tobacco use).

Statistical Analysis

Using IBM SPSS Statistics Version 19.0 (IBM Corp, Armonk, NY), descriptive statistics for the demographic characteristics were calculated, and a 1-way ANOVA was conducted to compare the mean number of health problems among participants at 3 levels of ACE scores (0-1, 2-3, ≥ 4). A hierarchical multiple regression analysis was conducted with QOL as the dependent variable to examine the extent to which ACEs and

Table 1. Demographic and other sample characteristics

Characteristic	No. (%) ^a
Age, y (n = 354)	
18-35	103 (29)
36-55	150 (42)
56-100	101 (29)
Sex (n = 352)	
Women	265 (75)
Men	87 (25)
Race and ethnicity (n = 352)^b	
White	229 (65)
African American	76 (21)
Asian	3 (1)
American Indian/Alaska Native	41 (12)
Native American/Pacific Islander	2 (1)
Hispanic	27 (8)
Education (n = 352)	
8th Grade or less	23 (6)
Some high school	61 (17)
High school diploma/GED	158 (45)
Technical school	49 (14)
Associate degree	33 (9)
Bachelor's degree	21 (6)
Graduate degree	7 (2)
Family status (n = 352)	
Married	94 (27)
Single	125 (35)
Living with partner	29 (8)
Divorced/separated	81 (23)
Widowed	23 (6)
Children under age 18 y (n = 346)	
No	187 (54)
Yes	159 (46)
Employment status (n = 325)	
Employed	93 (29)
Unemployed	232 (71)
Health problems (n = 352)	
≥ 2 Diagnosed medical problems	224 (64)
≥ 1 Diagnosed mental health and substance abuse problems	228 (65)
Children with special needs (n = 171)	
No	129 (75)
Yes	42 (25)
Veteran status (n = 352)	
No	333 (95)
Yes	19 (5)
Disability benefits (n = 340)	
No	192 (57)
Yes	148 (43)

^a Some percentages do not total to 100% because of rounding.

^b Race and ethnicity totals to 378 because the survey indicated "check all that apply" for the race and ethnicity question, so multiple responses were calculated.

GED = General Educational Development.

other concurrent sources of adversity were associated with QOL, controlling for demographic variables (eg, race/ethnicity, age, education) and comorbid physical and mental health conditions. The total count of medical conditions was highly positively skewed and, for the regression analysis, outlier values were replaced by a maximum value set at a threshold of 7 (ie, values ranged from 0 indicating no medical conditions to 7 indicating 7 or more medical conditions).

RESULTS

The final sample included 354 clinic patients at 3 OU School of Community Medicine sites: Internal medicine (n = 178), family medicine (n = 116), and community health (n = 60). Table 1 shows the demographics of the final sample. Most participants were single, white, and women. The racial-ethnic breakdown of the sample included white (65%), African American (21%), Hispanic (8%), Asian (1%), American

Indian/Alaska Native (12%), and Native American/Pacific Islander (1%). Nearly 71% of respondents were older than age 35 years, with 90% of respondents older than age 26 years. More than two-thirds (71%) of the sample were unemployed, and approximately 43% received disability benefits. Forty-five percent reported having completed their high school education, with only 2% of respondents reporting the completion of a graduate degree.

Results show a high level of adversity and disadvantage in this sample (Tables 2A, B, and C). More than 50% of respondents indicated receiving food assistance and reported high levels of material hardship and community problems. More than half reported experiencing IPV in the past 12 months. Just under one-third of the sample reported food insecurity in the past year (29%), almost one-fourth reported having their utilities shut off (24%), and more than half reported having trouble paying for their utilities (53%). Almost 60% of the sample reported current medical debt (58%), and 54% reported that they needed health care but did not seek it because of financial barriers. Additionally, 54% reported that they used the Emergency Department for care because they did not have a primary care physician.

Table 3 shows the frequency of each ACE category in the sample, which ranges from 17.5% for an imprisoned household member to 41.6% for verbal abuse and 58.3% for a separated or divorced parent. Figure 1 shows overall ACE scores. A high proportion of ACEs was found in the sample with 37% of the respondents reporting experiencing 4 or more categories of ACEs, whereas 27% reported 2 to 3 categories of ACEs, and 36% reported 0 to 1 category of ACEs. The proportion

Table 2A. Experiences of vulnerability and disadvantage

Experience	No. (%) reporting yes
Material hardship	
Problems paying utilities	187 (53)
Forgo medical care	130 (37)
Food insecurity	101 (29)
Utilities shut off	83 (24)
Eviction	29 (8)
Housing problems	
Rats/mice/roaches	123 (36)
Plumbing	72 (21)
Leaking ceiling or roof	53 (16)
Broken windows	39 (11)
Holes in floor	20 (6)
Holes in wall or ceiling	39 (11)
Exposed wires	16 (5)
Other in-home challenges	
Food stamps	201 (57)
Intimate partner violence: Current	191 (56)
Community safety	
Fairly unsafe	171 (49)
Very unsafe	115 (33)
Stay at home owing to safety concerns	86 (24)
Fairly safe	44 (13)
Very safe	22 (6)
Barriers to health care (HC)	
Current medical debt	198 (58)
Needed HC but did not receive because of financial barriers	186 (54)
Used ED because did not have a primary care physician	185 (54)
Needed HC but did not have insurance	169 (49)
Spent time in last year without health insurance	120 (36)
Not currently covered by health insurance	82 (24)
Used payday or title loan to pay for HC	25 (7)

ED = Emergency Department.

Table 2B. Experiences of vulnerability and disadvantage in the community

Community problems (n = 306)	No. (%) reporting		
	Rarely	Sometimes	Often
Lack of jobs	115 (47)	48 (20)	81 (33)
Stray dogs	197 (60)	64 (19)	69 (21)
Trash/litter/garbage	202 (62)	66 (20)	58 (18)
Crime	190 (61)	67 (22)	54 (17)
Rundown houses	230 (70)	48 (15)	49 (15)
Vandalism	203 (66)	71 (23)	32 (11)
Odors/smoke/gas	277 (85)	29 (9)	19 (6)

Table 2C. Scores on experiences of vulnerability and disadvantages

Scores ^a	Mean (SD)
Social support	27.36 (8.23)
Quality of life	24.10 (7.34)
Health literacy	4 (1.43)

^a Higher scores on social support and health literacy indicate higher levels of each: Social support (range = 7-88), health literacy (range = 0-5). Higher scores on quality of life (range = 5-41) indicate greater functional impact (eg, limitations, difficulty) owing to physical health or emotional problems. SD = standard deviation.

Table 3. Adult primary care patients reporting adverse childhood experiences (ACEs)

ACE category	Percentage of study sample
Separated/divorced	58.8
Verbal abuse	41.6
Alcohol/drugs	36.8
Emotional needs unmet	34.1
Physical abuse	31.9
Sexual abuse	28.1
Mental illness	26.8
Witness intimate partner violence	24.7
Physical needs unmet	19.6
Prison	17.5
ACE score, mean (SD)	3.15 (2.68)

SD = standard deviation.

Table 4. Diagnosed physical health conditions and mental health and substance abuse conditions, ranked

Condition	No. (%) coded yes
Physical health	
Hypertension	163 (47.5)
Hyperlipidemia	94 (27.4)
Obesity	92 (26.8)
Chronic back pain	80 (23.3)
Diabetes	63 (18.4)
Arthritis	57 (16.6)
Chronic headache, including migraine	37 (10.8)
Chronic obstructive pulmonary disease	33 (9.6)
Hepatitis C	26 (7.6)
Neuropathy	25 (7.3)
Chronic pain	25 (7.3)
Coronary artery disease	23 (6.7)
Asthma	22 (6.4)
Cerebrovascular stroke	16 (4.7)
Prediabetes/impaired glucose tolerance	15 (4.4)
Congestive heart failure	14 (4.1)
Chronic kidney disease	12 (3.5)
Cancer	11 (3.2)
Fibromyalgia	10 (2.9)
Peripheral artery disease	3 (0.9)
Human immunodeficiency virus infection	1 (0.3)
Mental health and substance abuse	
Depression	123 (35.9)
Tobacco use	120 (35.0)
Anxiety	73 (21.3)
Drug abuse (prescription/illegal)	17 (5.0)
Posttraumatic stress disorder	16 (4.7)
Bipolar disorder	15 (4.4)
Alcohol	13 (3.8)
Panic disorder	13 (3.8)
Schizophrenia	4 (1.2)
Borderline personality disorder	2 (0.6)

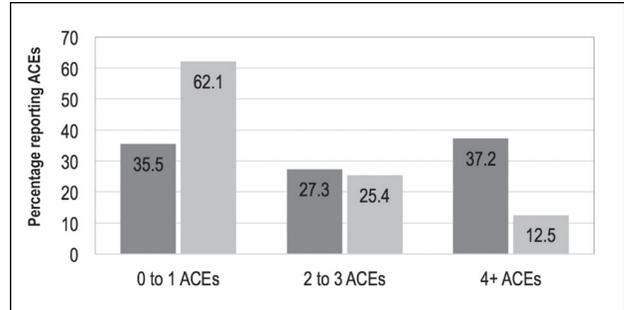


Figure 1. Adverse childhood experience (ACE) scores in adult primary care patients at The University of Oklahoma School of Community Medicine (dark gray) compared with original ACE study. Percentages show proportion of patients for each ACE score. Data from current study are compared with data from the ACE Study by the Centers for Disease Control and Prevention and Kaiser Permanente (light gray).¹

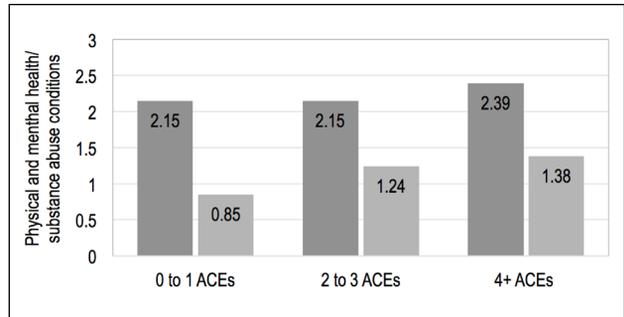


Figure 2. Mean physical health (dark gray) and mental health/substance abuse (light gray) conditions by adverse childhood experiences (ACEs).

of ACEs in our sample was substantially higher than that found in the original Centers for Disease Control and Prevention-KP study population,¹ as shown in Figure 1.

The number of health problems and mental health problems recorded from the electronic medical record for each participant ranged from 0 to 11, with an overall mean of 3.61 (standard deviation = 2.48). More than 60% of respondents had 2 or more medical disorders, and 65% reported 1 or more mental health and substance abuse disorders. Table 4 highlights the 32 health conditions ranked by prevalence in our sample. The top 5 physical conditions from the electronic medical record were hypertension (47.5%), hyperlipidemia (27.4%), obesity (26.8%), chronic back pain (23.3%), and diabetes (18.4%). The top 3 mental health and substance abuse conditions from the electronic medical record were depression (35.9%), tobacco use (35%), and anxiety (21.3%). The self-reported survey data also reflected some major health concerns. Almost 40% of the respondents reported that they currently smoked (38%), and 30% reported exercising regularly (the mean exercise time was just under 1 hour per week). The mean number of health problems for each of the ACE levels was as follows: ACEs 0 to 1 had a mean of 3.01 health problems (95% confidence interval = 2.96-3.88); ACEs 2 to 3, mean of 3.42 problems (95% confidence interval = 2.96-3.88); and ACEs 4 and above, mean of 4.18 problems (95% confidence

interval = 3.72-4.64). The difference in the mean number of health problems at the lowest and highest ACE levels was significant ($p = 0.001$). Figures 2 and 3 visually represent the dose-response relationship of health conditions and QOL by ACE categories.

Table 5 shows the findings at each step of the hierarchical regression. Each of the 4 models is a robust predictor of QOL, accounting for between 27.0% and 33.2% of the variance in QOL. Model 1 includes only the sociodemographic and social adversity variables (health literacy, social support, community problems, material hardship, and food assistance), each being significantly associated with QOL with the exception of education. With Model 2, chronic medical, mental health, and substance abuse conditions were added. In this model, health conditions and social adversity were significantly associated with QOL, but the sociodemographic variables and food assistance were not. In Model 3, current IPV was added and this model also was significantly associated with QOL. The strongest associations were shown with the variables representing social adversity (ie, social support, community problems, material hardship), chronic physical conditions, and mental health and substance abuse conditions. Current IPV was not significantly associated with QOL. Model 4 is the final model where the ACEs score is added. This model accounts for about one-third of the variance in QOL (adjusted $R^2 = 0.332$). Variables that contributed significantly in this model include age, health literacy, community problems, material hardship, chronic physical conditions, and ACEs. In summary, the most statistically significant independent variables related to QOL were age (older patients reported lower QOL), health literacy (patients with lower health literacy reported lower QOL), community problems (patients who reported community problems reported lower QOL), material hardship (patients who

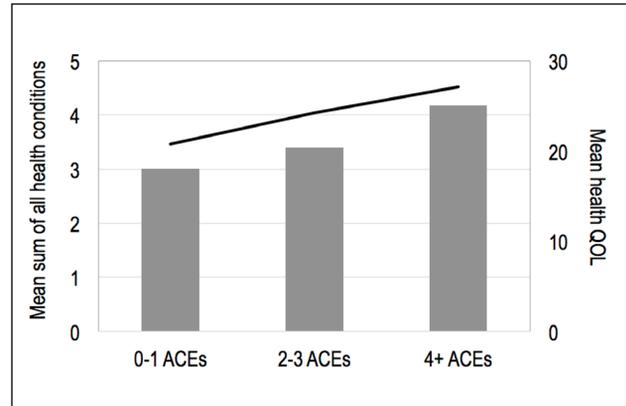


Figure 3. Mean quality of life (QOL) and all health conditions by adverse childhood experience (ACE) categories. Higher scores on QOL (range = 5-41) indicate greater functional impact (eg, limitations, difficulty) owing to physical health or emotional problems. All health conditions represent the total number of physical health and mental health conditions extracted from the review of the electronic medical record.

reported high levels of material hardship reported lower QOL), physical conditions (patients who reported more physical conditions reported lower QOL), and ACEs (patients who reported high ACEs reported lower QOL).

DISCUSSION

A very high rate of ACEs was found in this group of disadvantaged, adult primary care patients. Consistent with findings of previous studies, ACEs were dose-dependent with

Variable	Model 1: Demographics (β)	Model 2: Mental/physical health (β)	Model 3: Current IPV (β)	Model 4: ACEs (β)
Age	0.192^b	0.101	0.113^c	0.122^c
Ethnicity	0.100^c	0.077	0.085	0.071
Education	-0.055	-0.032	-0.045	-0.047
Health literacy	-0.125^c	-0.110^c	-0.103^c	-0.103^c
Social support	-0.103^c	-0.103^c	-0.107^c	-0.088
Community problems	0.239^b	0.232^b	0.218^b	0.187^b
Material hardship	0.280^b	0.256^b	0.245^b	0.219^b
Food assistance	0.116^c	0.091	0.080	0.068
Mental health and substance use	—	0.117^c	0.109^c	0.078
Chronic physical conditions	—	0.163^d	0.162^d	0.133^c
IPV: Current	—	—	0.088	0.068
ACE score	—	—	—	0.183^b
Adjusted R ²	0.270	0.302	0.307	0.332
F change	15.214^b	8.026^b	2.991	12.171^b

^a β is the standardized regression coefficient and indicates the individual contribution of each predictor to the model. Adjusted R² indicates how much of the variability in the dependent variable is accounted for by the predictors, adjusted for the number of predictors in the model. F change represents the statistical test of improvements in each model. For a detailed explanation of the multiple regression models, see the Results section of the text. Boldface denotes statistical significance.

^b p < 0.001.

^c p < 0.05.

^d p < 0.01.

ACE = adverse childhood experience; IPV = intimate partner violence.

the number of studied health problems in respondents. Respondents experienced high levels of disadvantage, including unemployment, low education levels, material hardship, and receipt of food stamps and disability benefits. This primary care sample, compared with the sample of the original ACE study,¹ reported higher rates of ACEs. Moreover, we found significant associations between QOL and social adversity (particularly community problems and material hardship), chronic medical problems, and ACEs. The association among ACEs, QOL, and medical problems is consistent with previous findings.¹⁻⁴

Of note, the association between QOL and mental health and substance abuse conditions was significant in the context of medical conditions and social adversity, as well as current IPV, but not ACEs (Table 5). This raises questions of the possible mediational role that historical trauma (as represented by ACEs) may have, particularly in vulnerable patient populations that experience comorbid medical, mental health, and substance abuse problems and multiple sources of socioeconomic disadvantage. Additional research could further investigate pathways among historical sources of trauma and mental health and substance abuse conditions to more fully understand the impact on QOL in populations affected by disparities.⁹

Our study is important in several ways. First, it reports ACEs in disadvantaged adults in a primary care sample and contrasts these findings with the clearly middle-class population of the original ACE study. Second, the multivariate models were robust predictors of QOL, accounting for almost one-third of the variance. Third, our study demonstrates the simultaneous effects of historical adversity (ACEs), concurrent adversity (community problems, material hardship), and chronic medical conditions on the QOL of vulnerable patients.

Obtaining and addressing this history of childhood trauma is not routine in medical practice, nor is it taught in medical training programs.¹⁸⁻²⁰ Many of the ACE-associated biopsychosocial risk factors are modifiable, and the mental health and substance abuse consequences associated with ACEs are treatable. However, physicians may not address ACEs or trauma-associated issues for fear of opening “Pandora’s box” (ie, a source of extensive problems for which they are not sufficiently prepared with training, resources, or time).^{10,18-21} Given the high prevalence of ACEs in the disadvantaged, chronically ill population that makes up a large portion of primary care patients, it is likely that the average primary care practitioner sees several of these ACE-affected patients every day. Additionally, ACE-affected patients have significantly higher numbers of health problems, thus requiring more office visits, increasing the likelihood of primary care exposure. Many ACE-affected patients have reacted to their childhood trauma by developing dysfunctional coping mechanisms such as smoking, substance abuse, or overeating, and although these coping mechanisms may serve them in the short run, the long-term health consequences can be severe. In addition, research documents that trauma disrupts neurodevelopment, executive functioning, and emotional regulation well into adulthood.²²

Patients affected by ACEs may not be as successful with traditional health behavioral change interventions because these approaches do not account for disrupted neurodevelopment, high levels of current disadvantage, poor QOL, and hardened health-risk behaviors that function as coping mechanisms. Trauma-informed approaches will likely yield better outcomes—in particular, shifting from the question, “What is wrong with you?” to “What has happened to you?” It is likely that some ACE-affected patients would benefit from mental health interventions either before or concurrent with traditional behavioral change techniques. Promising practices include cognitive behavioral therapy, meditation, mindfulness-based stress reduction, and executive function improvement.¹⁰ Incorporating ACE screening during routine care should be carefully considered and has been shown to be feasible.²³

Study limitations include the single-site study, cross-sectional design, and convenience sampling of regularly scheduled adult primary care patients. This limits the generalizability of findings. However, our findings are consistent with the extensive literature on ACEs demonstrating similar associations with physical and mental health problems, adversity, and QOL.

This population is from Oklahoma, which may be an epicenter for trauma and disadvantage,²⁴ but there are many similar populations throughout the US. Most importantly, the association between chronic health problems and ACEs is robust across populations. Health care practitioners working in similar settings should be aware of and trained in working with ACE-affected patients. The complex array of health problems, comorbid and chronic conditions, and the high level of disparity and vulnerability experienced by patients in many primary care practices certainly requires a thoughtful and multidisciplinary approach to care. In primary health care practices, particularly those serving vulnerable and at-risk populations, training and procedures for developing routine and appropriate ACE screenings and procedural responses to positive ACE screens are indicated.

Practitioners would likely benefit from ACE-informed training that includes skill development regarding how to screen, case-find, and address a history of childhood trauma within a time-limited patient visit and how to help patients understand the connection to their current health issues.¹⁸ Training should begin in medical education through the use of simulation and should also include faculty development as well as professional development that focuses on skills and practice recommendations for responding to ACEs.^{18,25} It is possible that addressing the trauma history of these patients could reduce health care costs via improved compliance, reduced office visits and hospitalizations, and reductions in risk factors for chronic disease. Certainly, addressing childhood trauma at its origins is essential, but the millions of ACE-affected adults need our attention now. Mitigating the impact of ACEs and bolstering resilience among adults may serve as a prevention strategy for generational trauma. ❖

Disclosure Statement

The author(s) have no conflicts of interest to disclose.

Acknowledgments

The authors thank the research coordinators of the Internal Medicine and Family and Community Medicine Departments of the School of Community Medicine (SCM), and the student and resident research assistants from OU-Tulsa and the SCM for their valuable help on this project. We thank the study participants whose willingness to share their lived experiences provides the foundation for greater understanding and momentum towards positive change.

Kathleen Louden, ELS, of Louden Health Communications performed a primary copy edit.

How to Cite this Article

Jelley M, Wen F, Miller-Cribbs J, Coon K, Rodriguez K. Adverse childhood experiences, other psychosocial sources of adversity, and quality of life in vulnerable primary care patients. *Perm J* 2020;24:18.277. DOI: <https://doi.org/10.7812/TPP/18.277>

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