Adverse childhood experiences and access and utilization of health care

Héctor E. Alcalá¹, Annalyn Valdez-Dadia², Ondine S. von Ehrenstein³

¹Department of Family, Population and Preventive Medicine, Stony Brook University, 101 Nicolls Road, Stony Brook, NY 11794, USA

²Center for Health Equity Research, California State University, Long Beach, 1250 Bellflower Blvd., MS-4510, FO5-120, Long Beach, CA 90840, USA

³Departments of Community Health Sciences and Epidemiology, University of California, Los Angeles, Jonathan and Karin Fielding School of Public Health, 640 Charles E Young Drive S, Los Angeles, CA 90024, USA

Address correspondence to Héctor E. Alcalá, E-mail: hectorapm@ucla.edu

ABSTRACT

Background Adverse childhood experiences (ACEs) have been associated with a variety of negative health outcomes. However, the association between ACEs and access and utilization of health care have been largely ignored.

Methods This study examined data from the 2011 Behavioral Risk Factor Surveillance System ($N = 101\,527$). We conducted logistic regression analyses, with nine ACEs as independent variables, in relation to the odds of being insured, having a personal health care provider and receiving a physician checkup in the past year. Unadjusted and adjusted multivariable models were estimated.

Results After accounting for potential confounders, all ACEs were associated with lower odds of being currently insured and receiving a physician checkup in the past year. Physical abuse, emotional abuse and several measures of household dysfunction were associated with lower odds of having a personal provider.

Conclusions Our findings suggest potential pathways by which ACEs may impact health. Provision of health insurance and providing care in a trauma-informed manner should be considered for individuals with a history of ACEs.

Keywords chronic disease, health services, individual behavior

Introduction

Adverse childhood experiences (ACEs), comprised of child abuse and household dysfunction, have been linked to a growing number of adverse health outcomes,¹ including cancer, heart disease, chronic bronchitis or emphysema, stroke, premature mortality, mental illness and substance abuse.^{2–10} Given these health consequences, it is important to assess associations of ACEs and outcomes preceding disease development and management; namely, access and utilization of health care.

Utilization of health care has been linked to improved health, including reduced mortality and overall health.¹¹ Child adversity is associated with utilization of health care in different ways, including higher rates of use of health care services particularly general practitioner services, emergency services and professional services, with presence of associations varying by the specific adversity under examination.^{12,13} For example, physical abuse, but not sexual abuse,

has been associated with more frequent utilization of health care services among female military veterans.¹⁴ Childhood adversity has been associated with utilization of specific health care services, for example, experiencing child abuse and neglect is associated with higher odds of receiving adequate prenatal care.¹⁵ Experiencing sexual abuse has been associated with lower odds of utilization of cervical cancer screening.^{16,17} Overall, existing research has shown that the impact of adversity on utilization of health care depends at least in part on the type of adversity and services in question.

One important determinant of utilization of health care is having access to health care,¹¹ which may be indirectly shaped by experiences of adversity in the USA. Being

Héctor E. Alcalá, Assistant Professor

Annalyn Valdez-Dadia, Evaluation Manager

Ondine S. von Ehrenstein, Professor

insured is associated with decreased rates of using emergency department services, smaller intervals between doctor visits, more recent doctor visits, reporting fewer barriers to accessing care and using a variety of preventative health services.^{18–22} Reporting a usual source of care, sometimes independent of insurance status, has been associated with similar patterns of utilization as those seen among the insured.^{18,19,21} Earlier reports suggest that the impact of ACEs on health is mediated by access to care.²³

ACEs might impact access and utilization of health care through several potentially co-occurring pathways. First, ACEs are associated with socioeconomic status (i.e. educational attainment, employment and income),^{24–30} which have been associated with poorer access and utilization of health care.^{31–33} Second, specific adversities lead people to avoid seeking health care services.¹⁶ This hesitancy to screen maybe attributable to discomfort with some procedures stemming from feelings of revictimization.^{34,35} Third, experiences of childhood adversity have been associated with a wide array of risky health behaviors in adolescents and adulthood including alcohol use and abuse, use of illicit drugs, use of tobacco products and risky sexual behaviors.^{8,9,36–38} These behaviors may emerge as a way of coping with negative household environments, and/or as a consequence of lack of curbing the adoption of these risky health behaviors in children by caretakers.³⁹ Thus, not using health care services may be part of a larger pattern of risky health behaviors. Finally, because people with ACEs tend to have poorer health, they may need to access health care services at higher rates.¹² Given the variety of ways in which ACEs can impact access and utilization of health care, a detailed examination is merited.

The current study had two goals: (i) Examine whether or not, ACEs are associated with proxies of access to health care and utilization of preventive care; and (ii) determine if associations between ACEs and utilization of preventive care persist after adjusting for access to care and financial barriers to health care. This study expands on the fairly limited research examining how early life adversity may impact access to health care and the utilization of preventive health care.

Methods

Data source

This study utilized data from the 2011 Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is a multi-stage, random digit dial, telephone survey designed to be representative of non-institutionalized adults (ages 18 and over) living in US states and territories. All data are

publically available online (https://www.cdc.gov/brfss/annual_data/annual_2011.htm).

The BRFSS collects data annually. A core set of questions were administered to all participants in all states and territories, while optional questions were administered to all or some participants in those states and territories electing to administer optional questions. Core questions are administered using a combination of cellphones and landlines in all states and territories.⁴⁰ Ten states (California, Maine, Minnesota, Montana, Nebraska, Nevada, Oregon, Vermont, Washington and Wisconsin) administered the ACE Scale.⁴¹ The median weighted American Association for Public Opinion Research response rate (RR4) for the 10 states that administered the ACE scale was 49.85%, which is higher than many comparable population-based telephone surveys in the United States.⁴²

Among the 10 states administering the ACE scale, there were 131 686 responders; since the California administration of the BRFSS omitted the item asking about living with an adult who had been jailed, we excluded the California sample from the analyses, resulting in 120 586 respondents. We used complete cases yielding an analytic sample of 101 527 respondents.

Previous research has shown that the sample is representative of the underlying population in terms of age and gender.⁴³ However, the sample tends to be less representative of the underlying racial distribution of the population of the nine states included in these analyses.⁴³ The prevalence of ACEs in this study is similar to previous studies using different data sets.^{17,44}

Variables

The main independent variables for this analysis were assessed with the ACE scale. This widely used 11-item scale measures the occurrence of the following events prior to age 18: (i) physical abuse; (ii) being touched sexually; (iii) attempted to be made to touch someone sexually; (iv) being forced to have sex; (v) psychological/emotional abuse; (vi) living with an adult who was depressed, mentally ill or suicidal; (vii) living with anyone who was a problem drinker or alcoholic; (viii) living with a drug user or abuser; (ix) living with someone who was incarcerated or jailed; (x) having parents who were separated or divorced; and (xi) living in a home where adults or parents physically harmed each other.³ All items were dichotomized to indicate if the respondents had ever experienced the adversity. Because three items measured facets of sexual abuse, they were combined into a single measure. This resulted in nine ACE measures. This coding scheme is consistent with previous

studies but refrains from summing these items into a scale.^{5,17,38}

The main outcomes (dependent variables) examined were measures of access and utilization of health care services. Access was measured with two dichotomous measures. The first, insurance status, asked respondents ‘Do you have any kind of health care coverage, including health insurance, pre-paid plans such as HMOs, or government plans such as Medicare or Indian Health Services?’ Those answering affirmatively were classified as insured. The second, having a personal health care provider, asked respondents, ‘Do you have one person you think of as your personal doctor or health care provider?’ Those answering that they had at least one personal doctor or health care provider were classified as having a personal health care provider. Utilization of preventive care was measured by asking respondents, ‘About how long has it been since you last visited a doctor for a routine checkup? A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition’. This variable was dichotomized to indicate whether or not a respondent had received a checkup in the past year. All dependent variables were coded as 0 or 1 where 1 represented having the attribute in question.

Several variables were included in analyses as potential confounders. Age was included as a continuous variable. Gender was measured as a dichotomous variable. Race and ethnicity was measured using a categorical variable representing the Office of Management and Budget’s race and ethnicity categories: non-Latino white, non-Latino Black/African American, non-Latino Asian, non-Latino other race and Latino. State of residence was measured using a categorical variable. Educational attainment (i.e. high school or less versus more than high school), and reporting cost as a barrier to seeking care from a doctor were coded using dichotomous variables.

Analytic strategy and framework

All analyses were conducted using Stata 14.1. We included weights to account for survey design and to yield robust standard errors. Means and frequencies were calculated as appropriate for the considered variables. We used logistic regression to estimate odds ratios (ORs), adjusted odds ratios (AORs) and 95% confidence intervals (CIs) to examine associations between the ACEs (independent (explanatory) variables) and the considered proxy of access and utilization of health care (‘having insurance’, ‘receiving a checkup last year’, ‘having a personal provider’, assessed as yes/no). We first estimated unadjusted associations of being insured or having a current provider (Tables 2 and 3),

(Model 1), for each ACE item in a separate model. We further adjusted for potential confounders (Model 2). In sensitivity analyses, all ACEs and potential confounders were included in one model (Model 3).

In the same manner we examined associations between the ACEs and use of preventive health care. We first estimated unadjusted associations of having a checkup (Table 4), (Model 1), for each ACE item in a separate model. We further adjusted for potential confounders (Model 2). We then added all ACEs into the same model (Model 3). Then, we adjusted the models for access to care using the proxy variables insurance status and having a current provider (Model 4), and financial barriers (Model 5).

Analyses were guided by extant research examining how early life adversity may impact the use of preventive health care services. Previous research has suggested that the association between ACEs and colorectal and cervical cancer screening is influenced by the type of ACE and cancer screening in question.^{17,44} We introduced variables in an ordered manner to examine the impact of several determinants of health care utilization, denoted in the Behavioral Model of Health Service Use.⁴⁵ This model states that use of health services is shaped by predisposing factors, enabling factors and need.⁴⁵ ACEs and most sociodemographic factors would encompass predisposing factors, raising the question whether ACEs play a role, even after accounting for other predisposing factors. Introducing enabling factors (access to health care and financial barriers to care), allows us to examine whether or not these relationships persist, in the case of use of health care, after accounting for predisposing factors. Need is less important to consider given that the outcomes under consideration do not have to do with treatment of existing medical conditions and existing work suggesting that access to health care is a precursor of health in the association between ACEs and health.⁴⁶

Results

Weighted descriptive statistics are shown in Table 1. The majority of the sample was insured. Over four-fifths of the sample had a personal health provider. Almost two-thirds of the sample had received a checkup in the past year. The most commonly experienced childhood adversity was emotional abuse and the least commonly experienced was living with someone who was incarcerated or jailed. Mean age among respondents was just over 47. About half of respondents were female. Most respondents were white. Two-thirds of respondents had more than a high school education. Most respondents did not report cost as a barrier to

Table 1 Sample characteristics, BRFSS 2011 (N = 101 527)

<i>Variable</i>	<i>% or Mean</i>	<i>Standard error</i>
Insurance status	%	%
Insured	85.82	0.31
Uninsured	14.18	0.31
Has personal health provider	%	%
Yes	80.24	0.35
No	19.76	0.35
Routine checkup in the past year	%	%
Yes	36.27	0.40
No	63.73	0.40
Adverse childhood experiences	%	%
Physical abuse	17.10	0.31
Sexual abuse	11.67	0.24
Emotional abuse	37.00	0.40
Lived with someone who was mentally ill	17.28	0.32
Lived with problem drinker	25.07	0.35
Lived with drug user	10.32	0.26
Lived with someone who was jailed	6.80	0.25
Parents divorced or separated	24.59	0.38
Adults in household treated each other violently	16.70	0.32
Age	47.29	0.15
Gender	%	%
Male	49.35	0.41
Female	50.65	0.41
Race	%	%
White	84.50	0.34
Black	3.00	0.16
Latino	6.13	0.24
Asian	2.58	0.15
Other	3.79	0.17
Education	%	%
High school or less	38.22	0.41
More than high school	61.78	0.41
Cost a barrier to receiving care in past year	%	%
Yes	12.95	0.29
No	87.05	0.29
State of residence	%	%
Maine	2.85	0.06
Minnesota	21.13	0.23
Montana	4.06	0.06
Nebraska	7.48	0.11
Nevada	4.87	0.14
Oregon	7.35	0.16
Vermont	2.74	0.04
Washington	27.48	0.24
Wisconsin	22.04	0.34

Note: All means, frequencies and standard errors are weighted.

receiving care in the past year. Over a fourth of respondents lived in Washington.

Table 2 shows the results of logistic regression models estimating odds of being insured from each of the ACEs. In bivariate models (Model 1), all ACEs were associated with reduced odds of being insured, with living with a drug user (OR = 0.56; 95% CI = 0.48, 0.64) and living with someone who was jailed (OR = 0.56; 95% CI = 0.47, 0.67) being associated with the greatest reduction in odds. When confounders were added into the model (Model 2), all relationships remained negative. When odds ratios were estimated co-adjusting for all ACEs and for potential confounders (Model 3) only certain ACEs were associated with insurance status. Sexual abuse (AOR = 0.83; 95% CI = 0.70, 0.98), living with a problem drinker (AOR = 0.85; 95% CI = 0.73, 0.98), living with a drug user (AOR = 0.83; 95% CI = 0.69, 0.99) and living in a household where adults treated each other violently (AOR = 0.79; 95% CI = 0.67, 0.92) were associated with lower odds of being insured, respectively.

Table 3 shows the estimated odds of having a personal provider in relation to each of the ACEs. In unadjusted models (Model 1), physical abuse (OR = 0.84; 95% CI = 0.76, 0.94), emotional abuse (OR = 0.82; 95% CI = 0.74, 0.89), living with a drug user (OR = 0.60; 95% CI = 0.52, 0.69), living with someone who was jailed (OR = 0.61; 95% CI = 0.51, 0.72), having parents that were divorced or separated (OR = 0.68; 95% CI = 0.61, 0.75) and living in a household where adults treated each other violently (OR = 0.84; 95% CI = 0.74, 0.94) were associated with lower odds of having a personal provider. Being sexually abused was associated with higher odds of having a personal provider (OR = 1.16; 95% CI = 1.02, 1.31). When confounders were added into the model (Model 2), physical abuse (AOR = 0.89; 95% CI = 0.79, 1.00), emotional abuse (AOR = 0.80; 95% CI = 0.73, 0.88), living with someone who was mentally ill (AOR = 0.80; 95% CI = 0.71, 0.91), living with a drug user (AOR = 0.62; 95% CI = 0.54, 0.72), living with someone who was jailed (AOR = 0.69; 95% CI = 0.58, 0.82) and having parents who were divorced or separated (AOR = 0.70; 95% CI = 0.63, 0.78) were associated with lower odds of having a personal provider, respectively. Co-adjusting for all ACEs and for potential confounders (Model 3), indicated that living with a drug user was associated with lower odds of having a personal provider (AOR = 0.80; 95% CI = 0.67, 0.94).

Table 4 shows the estimated odds of having received a checkup in the past year from each of the ACEs. In unadjusted models (Model 1), physical abuse (OR = 0.89; 95% CI = 0.81, 0.97), emotional abuse (OR = 0.83; 95%

Table 2 Logistic regressions estimating the odds of being insured related to ACEs, BRFSS 2011 (N = 101 527)

<i>ACEs (independent variable)</i>	<i>Model 1: Bivariate</i>		<i>Model 2: Confounders</i>		<i>Model 3: All ACE measures and confounders</i>	
	<i>OR</i>	<i>95% CI</i>	<i>AOR</i>	<i>95% CI</i>	<i>AOR</i>	<i>95% CI</i>
Physical abuse	0.67	(0.59, 0.75)	0.73	(0.64, 0.82)	0.93	(0.79, 1.09)
Sexual abuse	0.77	(0.67, 0.88)	0.74	(0.64, 0.86)	0.83	(0.70, 0.98)
Emotional abuse	0.74	(0.66, 0.82)	0.72	(0.64, 0.80)	0.97	(0.85, 1.11)
Lived with someone who was mentally ill	0.79	(0.70, 0.90)	0.72	(0.63, 0.83)	1.09	(0.92, 1.28)
Lived with problem drinker	0.70	(0.63, 0.78)	0.72	(0.64, 0.81)	0.85	(0.73, 0.98)
Lived with drug user	0.56	(0.48, 0.64)	0.58	(0.50, 0.67)	0.83	(0.69, 0.99)
Lived with someone who was jailed	0.56	(0.47, 0.67)	0.70	(0.57, 0.85)	1.21	(0.97, 1.52)
Parents divorced or separated	0.63	(0.56, 0.70)	0.69	(0.62, 0.78)	0.99	(0.87, 1.13)
Adults in household treated each other violently	0.59	(0.53, 0.67)	0.66	(0.58, 0.75)	0.79	(0.67, 0.92)

Model 1 includes each ACE separately. Model 2 includes additionally age, gender, race, education and state of residence. Model 3 includes all ACEs simultaneously in addition to age, gender, race, education and state of residence.

Table 3 Logistic regressions estimating the odds of having a personal provider related to ACEs, BRFSS 2011 (N = 101 527)

<i>ACEs (independent variable)</i>	<i>Model 1: Bivariate</i>		<i>Model 2: Confounders</i>		<i>Model 3: All ACE measures and confounders</i>	
	<i>OR</i>	<i>95% CI</i>	<i>AOR</i>	<i>95% CI</i>	<i>AOR</i>	<i>95% CI</i>
Physical abuse	0.84	(0.76, 0.94)	0.89	(0.79, 1.00)	0.96	(0.83, 1.11)
Sexual abuse	1.16	(1.02, 1.31)	0.98	(0.86, 1.12)	0.98	(0.85, 1.14)
Emotional abuse	0.82	(0.74, 0.89)	0.80	(0.73, 0.88)	0.98	(0.87, 1.09)
Lived with someone who was mentally ill	0.91	(0.81, 1.02)	0.80	(0.71, 0.91)	1.12	(0.97, 1.29)
Lived with problem drinker	0.92	(0.83, 1.02)	0.91	(0.82, 1.01)	0.99	(0.88, 1.12)
Lived with drug user	0.60	(0.52, 0.69)	0.62	(0.54, 0.72)	0.80	(0.67, 0.94)
Lived with someone who was jailed	0.61	(0.51, 0.72)	0.69	(0.58, 0.82)	1.08	(0.88, 1.33)
Parents divorced or separated	0.68	(0.61, 0.75)	0.70	(0.63, 0.78)	0.95	(0.84, 1.06)
Adults in household treated each other violently	0.84	(0.74, 0.94)	0.89	(0.79, 1.01)	0.98	(0.85, 1.14)

Model 1 includes each ACE separately. Model 2 includes additionally age, gender, race, education and state of residence. Model 3 includes all ACEs simultaneously in addition to age, gender, race, education and state of residence.

CI = 0.77, 0.89), living with someone who was mentally ill (OR = 0.81; 95% CI = 0.74, 0.89), living with a drug user (OR = 0.70; 95% CI = 0.62, 0.78), living with someone who was jailed (OR = 0.75; 95% CI = 0.64, 0.88), having parents that were divorced or separated (OR = 0.84; 95% CI = 0.77, 0.91) and living in a household where adults treated each other violently (OR = 0.86; 95% CI = 0.79, 0.95) were associated with lower odds of receiving a checkup in the past year. When confounders were included in the model (Model 2), all ACEs were associated with lower odds of receiving a checkup in the past year. When adjusted odds

ratios for the ACEs were estimated co-adjusting for all other ACEs (Model 3), being sexually abused was associated with lower odds of receiving a checkup in the past year (AOR = 0.86; 95% CI = 0.77, 0.96). Additionally, adjusting for access to care (Model 4), being sexually abused was associated with lower odds of receiving a checkup in the past year (AOR = 0.86; 95% CI = 0.77, 0.97), but this association was slightly weaker in Model 5 just including the null (AOR = 0.91; 95% CI = 0.81, 1.01). Additionally, accounting for costs as a barrier to access (Model 5), having parents that were divorced or separated was associated with higher odds of

Table 4 Logistic regressions estimating the odds of receiving a checkup in the past year related to ACEs, BRFSS 2011 (*N* = 101 527)

	<i>Model 1: Bivariate</i>		<i>Model 2: Confounders</i>		<i>Model 3: All ACE measures and confounders</i>		<i>Model 4: All ACE measures, confounders and access to care</i>		<i>Model 5: All ACE measures, confounders, access to care and barriers to care</i>	
<i>ACEs (independent variable)</i>	<i>OR</i>	<i>95% CI</i>	<i>AOR</i>	<i>95% CI</i>	<i>AOR</i>	<i>95% CI</i>	<i>AOR</i>	<i>95% CI</i>	<i>AOR</i>	<i>95% CI</i>
Physical abuse	0.89	(0.81, 0.97)	0.91	(0.83, 1.00)	1.05	(0.94, 1.17)	1.07	(0.95, 1.20)	1.09	(0.97, 1.23)
Sexual abuse	0.97	(0.88, 1.07)	0.84	(0.76, 0.92)	0.86	(0.77, 0.96)	0.86	(0.77, 0.97)	0.91	(0.81, 1.01)
Emotional abuse	0.83	(0.77, 0.89)	0.83	(0.77, 0.89)	0.97	(0.89, 1.06)	0.98	(0.89, 1.07)	0.99	(0.90, 1.08)
Lived with someone who was mentally ill	0.81	(0.74, 0.89)	0.76	(0.69, 0.83)	0.93	(0.84, 1.03)	0.90	(0.80, 1.00)	0.93	(0.83, 1.04)
Lived with problem drinker	0.93	(0.86, 1.01)	0.91	(0.84, 0.99)	1.00	(0.91, 1.09)	1.01	(0.92, 1.12)	1.03	(0.93, 1.13)
Lived with drug user	0.70	(0.62, 0.78)	0.70	(0.62, 0.79)	0.89	(0.78, 1.02)	0.95	(0.82, 1.09)	0.98	(0.85, 1.13)
Lived with someone who was jailed	0.75	(0.64, 0.88)	0.76	(0.64, 0.88)	1.07	(0.89, 1.28)	1.04	(0.86, 1.26)	1.06	(0.88, 1.29)
Parents divorced or separated	0.84	(0.77, 0.91)	0.83	(0.77, 0.91)	1.08	(0.98, 1.19)	1.11	(1.00, 1.23)	1.11	(1.00, 1.23)
Adults in household treated each other violently	0.86	(0.79, 0.95)	0.85	(0.78, 0.94)	0.91	(0.81, 1.02)	0.93	(0.82, 1.04)	0.95	(0.84, 1.07)

Model 1 includes each ACE separately. Model 2 includes additionally age, gender, race, education and state of residence to models. Model 3 includes all ACEs simultaneously in addition to age, gender, race, education and state of residence. Model 4 additionally includes access to care measures (insurance and having a personal provider). Model 5 additionally includes costs as barrier to utilization of care. Models 3–5 build on one another.

receiving a checkup in the past year (AOR = 1.11; 95% CI = 1.00, 1.23).

Discussion

Main findings

Overall, our findings suggest that childhood adversities are associated with access to health care and utilization of preventive health care services among adults. In terms of insurance status, all ACEs were associated with lower odds of being insured, after accounting for important sociodemographic factors as potential confounders. Only four ACEs were associated with insurance status, after accounting for all other ACEs. Having a personal health care provider was also inversely associated with most ACEs after accounting for confounders. Only living with a drug user remained associated with having a personal health care provider after accounting for other ACEs. Furthermore, all ACEs were inversely associated with receiving regular checkups. However, only sexual abuse remained associated with lower odds of receiving a checkup, after accounting for other ACEs. Adjusting for access to health care did not change this association, but financial barriers to health care appeared to have an influence.

What is already known on this topic

As noted earlier, previous research has noted that specific ACEs are associated with access and utilization of health

care. Namely, ACEs, were associated with higher rates of using general practitioner services, emergency services and professional services.^{12,13} However, in terms of preventive care, findings have been more mixed, with some studies showing both positive and negative associations between ACEs and cancer screenings.^{16,17}

What this study adds

These results suggest three potential pathways by which ACEs can impact health. First, as the ACEs were inversely associated with being insured, ACEs appear to compromise an individual's ability to access resources. This is consistent with existing research showing that ACEs are associated with a lower socioeconomic status.^{24–29} The present study extends these findings by observing a specific resource that can be used to improve or maintain health, like health insurance.

Also, given the negative associations between ACEs and having a personal provider, findings suggests that ACEs compromise an individual's ability to access a provider and thus receive care if needed. However, the available data based on the BRFSS does not permit the examination of reasons for not having a personal care provider (i.e. availability of providers, not needing a provider, not wanting a provider, etc.).

Additionally, the inverse associations between ACEs and receiving an annual checkup, after accounting for sociodemographic characteristics may suggest that individuals

experiencing ACEs are avoiding regular health care. This is consistent with the literature showing that adversity is associated with negative health behaviors^{8,9,36–38} and inconsistent with a study suggesting adversity leads to increased health services utilization^{12,13} potentially because of the poorer health associated with adversity. However, given that much of the existing work on health services utilization and ACEs has been conducted in Canada,^{12,13} we must also consider that there are fewer barriers to utilizing care in a system that grants universal health care. In the US context, recent work has shown that experiencing ACEs is associated with decreased use of both cervical and colorectal cancer screening,^{17,47} mirroring the pattern observed in the present study for utilization of health care.

The findings also highlight unique variability in the associations explained by specific ACEs. For all three outcomes, in fully adjusted models only certain ACEs were associated with the outcome. The findings highlight the importance of some child adversity in influencing access and utilization of health care. For example, after accounting for other ACEs and confounders, only sexual abuse was associated with utilization of care. This association remained after controlling for access to care. However, after additionally adding financial barriers to care to the model, the confidence interval widened to include the null value. Nonetheless, the findings may indicate that interventions to increase utilization of care among survivors of sexual abuse will have limited impact if they focus exclusively on ensuring access. Instead, additional efforts are needed to ensure that utilization is affordable. Overall, the nuanced associations that emerge challenge the prevailing paradigm in ACEs research that seeks to treat ACEs as interchangeable experiences,³ irrespective of the outcome under examination. Future research should carefully consider hypothesized connections between ACEs to guide careful data analyses instead of summing ACE items into a scale when not appropriate.

Findings also highlight important disparities in access to health care among those who experience childhood adversity. Namely, experiencing almost any adversity was associated with lower odds of being insured or having a personal provider. Consequently, broad efforts to increase insurance coverage at the population level may help individuals with a history of ACEs gain access to care. Because the data utilized for this study was collected before the full insurance expansion provisions of the Affordable Care Act (ACA),^{48,49} future work should explore if the ACA has been successful in granting access to care to individuals with a history of ACEs. However, because one ACE was associated with lower utilization of care, even after accounting for access to health care, efforts to expand

access and utilization of health care must extend beyond simply providing access.

Limitations of this study

This study has several limitations to consider in the interpretation of our results. The data are cross-sectional thus the temporal sequencing of events cannot be determined. As a result, future work should be done to examine the observed phenomena using longitudinal and other study designs. While the BRFSS is designed to be representative of the US states surveyed, the states that were included do not represent the heterogeneity of the US as a whole. As a result, generalizations should be made with caution. Although the weights in the BRFSS attempt to account for survey non-response (i.e. people not answering phones), non-response bias has been a recorded issue with the BRFSS.⁵⁰ Our analyses were adjusted for potential confounders such as age and gender, however, we cannot exclude uncontrolled confounding. Moreover, the self-reported nature of the BRFSS allows for response bias. This may be of particular concern for sensitive items like the ACE module, which may lead to underreporting and, thus, would likely bias the estimated associations to the null. Finally, as discussed earlier, extant research has shown that the present study sample does not fully reflect the racial composition of the states included in analyses, thus limiting the generalizability of the findings.

Conclusions

Despite this study's limitations, the findings highlight risk factors for compromised access and utilization of health care. Policy efforts should consider methods to increase access to care among those with a history of child adversity. Ensuring that individuals with documented experiences of child abuse or household dysfunction have insurance during the transition into adulthood may be an important first step in this process. For example, populations with a high burden of adversity, like those in foster care,⁵¹ may benefit from continued coverage as they become adults and lose eligibility for health care benefits. This may imply extending benefits to those currently ineligible for government sponsored insurance coverage, or providing assistance with enrollment into public programs to those transitioning out of foster care. Also, health care providers could adjust the care they deliver to be sensitive to the needs of those who have encountered childhood trauma. As a first step, this would require that providers screen their patients for adversity. However, the benefits and best approaches to implementing universal screening of patients by health care providers

remains under contention.⁵² However, when a history of adversity is divulged by a patient, providers can modify their services to follow a more appropriate trauma-informed care model,^{53,54} in order to ensure that a negative or uncomfortable experience with a provider does not discourage those affected from future use of preventive health care, like an annual checkup. In fact, recent research has shown that some ACEs are associated with current noncompliance with Pap test screening recommendations, but not lifetime screening,¹⁷ suggesting that receiving a Pap test may discourage future screening among those with a history of adversity.

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