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Abstract

In the past twenty years, multiple studies have shown the relationship between childhood adversity and later negative health consequences. Yet the extent to which the public is aware of this relationship is unclear. We surveyed Black and White college students about their knowledge of the long-term effects of Adverse Childhood Experiences (ACEs). Students read vignettes comparing children exposed and unexposed to ACEs, and predicted their mental, physical, and social health as adults. Participants were aware of the effect of ACEs on later mental and social health, but not as aware of the risks on physical health. Black and White students had similar knowledge, but Black students attributed some childhood adversity (e.g., physical abuse) as having less impact in adulthood than White participants. These results offer insight into the beliefs of college students and could serve as a basis for targeted interventions aimed at raising awareness and preventing adversity.

Keywords

Adverse Childhood Experiences (ACE), Long-term health, College students, Diversity

Disciplines

Health Psychology | Psychology | Social Psychology

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ABSTRACT

In the past twenty years, multiple studies have shown the relationship between childhood adversity and later negative health consequences. Yet the extent to which the public is aware of this relationship is unclear. We surveyed Black and White college students about their knowledge of the long-term effects of Adverse Childhood Experiences (ACEs). Students read vignettes comparing children exposed and unexposed to ACEs, and predicted their mental, physical, and social health as adults. Participants were aware of the effect of ACEs on later mental and social health, but not as aware of the risks on physical health. Black and White students had similar knowledge, but Black students attributed some childhood adversity (e.g., physical abuse) as having less impact in adulthood than White participants. These results offer insight into the beliefs of college students and could serve as a basis for targeted interventions aimed at raising awareness and preventing adversity.

Keywords: Adverse Childhood Experiences (ACE), long-term health, beliefs, college students

Over 20 years ago, Felitti et al. (1998) published a landmark study on the relationship between childhood adversity and the detrimental effects on mental and physical health and social outcomes later in life. In a survey with 9,500 respondents, the study identified a strong graded relationship between adverse childhood experiences

(ACEs), such as abuse from caregivers (emotional, physical, or sexual), or living in dysfunctional households before the age of 18 (witnessing domestic violence, living with substance abusers, mentally ill, suicidal, or ever imprisoned) and long-term mental and physical health challenges (Felitti et al., 1998). Participants with ACEs had increased chances for alcoholism, drug abuse, depression, and suicide attempts (4 to 12 times increase). Current research has confirmed findings on the negative impact of ACEs on mental health issues such as addiction, depression, and suicidal risk (Petruccioli et al., 2019), as well as graded associations between ACEs and a host of chronic physical issues (e.g., cardiovascular disease, cancer, respiratory disease, Type 2 diabetes, and obesity; Hughes et al., 2017).

Survivors of abuse and household dysfunctions are also more likely to suffer from difficulties in their relationships (Kendall-Tackett, 2002), to have more unstable social networks or marriages (Sven-Olof et al., 2021), lower job qualifications and higher financial insecurity (Metzler et al., 2017), and more criminal arrests (Horan et al., 2015). The associations between ACEs and later health may arise in part from the use of behavioral coping mechanisms, such as smoking or alcohol. These coping mechanisms may then lead to increased risks of heart attacks and other illnesses. However, early adversity and chronic psychosocial stress also lead to changes in the hypothalamic–pituitary–adrenal (HPA) axis and increase inflammation levels. Inflammation in turn causes abnormalities in the nervous, endocrine, and immune systems (Deighton et al., 2018). These findings indicate that health disparities often originate during development, and consequently, awareness of the cost of early adversity is crucial for prevention and treatment (Shonkoff et al., 2009). What has become quite clear, specifically in the advent of the COVID-19 pandemic, is how the intersection of low-income, race, and infection rates jeopardize people of color to a greater extent than other groups (Seligman et al., 2021). A similar situation exists with the intersectionality of exposure to ACEs, income, and race/ethnic background (Strompolis et al., 2019). Racial and ethnic minority youth are more at risk for exposure to adversity than White youth (Liu et al., 2018) and may experience more pronounced long-term health effects (Brody et al., 2014). These findings highlight the importance of preventing and mitigating childhood adversity exposure in these at-risk populations.

In this paper, we focused on one specific vulnerable population, college students. Recent trends indicate high levels of mental health distress in college students for various reasons, such as adapting to the transition from home to college, changes in lifestyle, higher workload, or financial strains (Sharp & Theiler, 2018). In recent years, college students have faced increased stressors associated with the COVID-19 pandemic (Gallup & Lumina, 2022). Students from underserved communities (e.g., Black, Indigenous, and People of Color, BIPOC) are particularly at risk for mental health problems due to discrimination and racism (Hunt et al., 2015). The prevalence of childhood adversity in the college population is similar to the general population (Anders et al., 2012). For example, in a large study with about 6,000 undergraduate students, 58.5% to 84.5% reported having experienced at least one adverse event, and about 20% reported symptoms consistent with sub-clinical PTSD (Smyth et al., 2008). In a 2016 longitudinal survey of college students, about a third of respondents had two or more ACEs in their childhood, and the number of ACEs predicted

increased mental health issues during the college years (Karatekin, 2016). College students with high ACEs have poorer overall health and higher substance abuse issues than students with no or few ACEs (Windle et al., 2018; Kim, 2017), and the long-term effects of childhood adversity are similar to the general population (Khrapatina & Berman, 2017).

Despite the established links between childhood adversity and later health problems and the possibility of curtailing illness via prevention and treatment, a recent study polling about 2,000 adults found that only 13% of the respondents knew of the ACEs (Gollust et al., 2022). It is unclear whether college students are aware of the harmful effects of childhood adversity. The main goal of this research was to document college students' knowledge of the long-term impact of ACEs in a diverse college population to better understand attitudes and knowledge about early trauma and its consequences. Such an understanding would help guide the development of targeted interventions.

We designed a survey consisting of vignettes about two children – one child exposed to a specific type of adversity, the other child who was not. Vignettes allow researchers access to personal and sensitive information by creating a bridge between the vignette and the participants. The vignettes, presented in narrative form, were based on the existing ACEs research findings, allowing us to address ACEs in the survey without directly asking participants about their experiences. This methodology is a non-threatening and unbiased way for exploring participants' attitudes and beliefs toward the ACEs (Riley et al., 2021; Kandemir & Budd, 2018). Participants' task was to predict the mental, physical, and social health of the children as adults. The vignettes were based on well-established empirical findings on the effects of ACEs on adult mental (substance abuse, depression, anxiety), physical (cancer, diabetes, stroke), and social health (educational attainment, earnings, employment; crime, social network/family), (see Petrucci et al., 2019; Basto-Pereira et al., 2022; Shahab et al., 2021).

As mentioned above, Gollust et al. (2022) reported that only 13% of their sample was aware of the ACEs, but their sample was older than traditional college age. To our knowledge, there is no data on college students' knowledge about ACEs and their consequences, and our hypotheses were therefore speculative. We hypothesized that our sample, composed of students taking introductory courses in psychology and social work, would be *somewhat aware* of the risks for mental and social health, but they would be *less aware* of the risks for physical health problems. We did not have specific predictions for social health, except for the possibility of perceiving weaker social networks in ACE children. Lecroy and Milligan-Lecroy (2020) surveyed U.S. adults on their perceptions of child abuse and maltreatment and found that most of their sample was not only aware of the issue but also perceived child abuse and maltreatment as detrimental to child wellbeing. We hypothesized that child abuse would be deemed overall as *more likely* to cause later health problems compared to household dysfunctions. Among the different household dysfunctions, we predicted participants would rate divorce as *less costly* than other problems. While divorce or parental separation is classified as an ACE (Felliti et al., 1998), college students have positive views toward divorce when the marriage is unhappy (Diaz et al., 2013). Although divorce can lead to unfavorable outcomes, particularly, in students'

academic performance, the individual may find the experience manageable if other protective factors are in place (Brand et al., 2019). We also hypothesized that participants would perceive parental alcohol and drug abuse to place a child *more at risk* for adverse long-term health than other household dysfunctions. We based this prediction on the literature documenting the harmful effects of parental alcohol and drug abuse (Felliti et al., 1998).

We were also interested in how race and ethnicity could influence perception and knowledge about ACEs. While our participants did not know the race of the children they were asked to compare, we wanted to assess whether their racial and ethnic identity would affect their perception of adversity and their evaluation of its consequences. Given the higher prevalence of ACEs in minority populations (Liu et al., 2018), we predicted greater awareness of the long-term consequences of ACEs among Black participants compared to White participants. However, the under-utilization of counseling on college and university campuses by BIPOC students (Jones et al., 2020) made this prediction tentative.

METHOD

Participants and Procedure

The current study was approved by the respective Institutional Review Boards. We recruited Black and White undergraduate college students enrolled at a historically Black institution in the South of the United States and a small liberal arts college in a Mid-Atlantic state of the US. Participants completed the survey between March 2018 and March 2020. Students enrolled in introductory psychology and social work courses could participate in the study. A total of 158 participants gave informed consent and participated in the survey. We excluded four participants who had only partial answers. The final sample included 154 participants, 80 Black participants enrolled in a social work course ($M_{Age} = 21.23$, $SD = 1.85$; age range: 19-33; 88.8% female participants, 11.1% male participants) and 74 White participants enrolled in a general psychology course ($M_{Age} = 19.63$, $SD = .91$; age range: 19- 23; 46% female participants, 54% male participants). Black participants were, on average, 16 months older than White participants, $t(150) = 6.90$, $p < .001$. Most of our students were traditional 18-24 students enrolled in an undergraduate program as defined by the Gallup and Lumina Foundation State of Higher Education (2022). One Black student was above this age range (33 years) and was thus non-traditional.

Participants completed the survey online via a Qualtrics link for extra credit in psychology and social work introductory courses. All participants completed the survey in their own time. The debriefing included information about ACES (summary of research and links to relevant sites). The survey included questions about the long-term effects of childhood adversity and participants' beliefs about factors instrumental to building resilience. Here, we only report data concerning the long-term effects of adversity.

ACE Vignettes

The survey consisted of vignettes based on the original ACEs questionnaire (see Table 1 for a description of each vignette). Each vignette compared two children (with no gender, race, ethnicity, or age indication). One was exposed to an adverse event during childhood, either trauma or household dysfunction, and the other was not exposed. Vignettes for household dysfunctions included having a parent incarcerated, witnessing domestic violence, parental drug or alcohol abuse, and divorce. The vignettes describe scenarios of a child who has experienced emotional, sexual, or physical abuse or any combination of the different types of abuse. Each vignette compared two children, one exposed to an ACE and another not exposed to that specific ACE. For example, one of the vignettes read: “Imagine two children under 18 years of age. One of them “lives with someone who is depressed, mentally ill, or suicidal. The other child does NOT”. Participants read a total of 12 different vignettes presented in random order.

Table 1: Vignettes Based on the Adverse Childhood Experiences (ACE) Questionnaire and Presented to Each Participant

Type of ACE	Vignette
Abuse	Emotional abuse
	Physical abuse
	Sexual abuse
	Sexual/Emotional abuse
	Sexual/Physical abuse

Household dysfunction	Emotional/Physical abuse	“experiences emotional abuse (being sworn at, insulted, or put down) AND physical abuse (hit, kicked, physically hurt) by a parent or adult in their home”
	Divorce	“has parents who are separated or divorced”
	Parental alcohol abuse	“lives with someone who is a problem drinker or alcoholic”
	Parental drug abuse	“who uses illegal drugs or who abuses medications”
	Parent incarcerated	“lives with someone who has served time or has been sentenced to serve time in a prison, jail, or other correctional facility”
	Parental mental illness	“lives with someone who is depressed, mentally ill, or suicidal”
	Witnessing parental abuse	“witnesses their parents or adults at home slap, hit, kick, punch, or beat each other up”

Note: For each vignette the comparison was between a child exposed to an ACE and a child not exposed to that ACE. Each vignette started with the sentence: “Imagine there are two children under 18 years of age. One of them is experiencing [specific ACE added]. The other child does NOT experience [specific ACE added]”.

Measures

We base our measures on empirical results of the long-term outcomes of ACEs. For each vignette, we asked participants to predict the two children’s long-term mental, physical, and social health (see Table 2 for the list of questions). For example, after reading the vignette about two children, one living with someone with alcohol issues, we asked, “which child is more likely to abuse drugs or alcohol as an adult?”. The ratings ranged from 0 to 100, with a score of 0 indicating that the ACE-unexposed child would have a higher likelihood of suffering from a particular ailment/problem, a score of 100 indicating that the ACE-exposed child would have a higher likelihood of suffering from an ailment/problem, and a score of 50 indicating that both children would be equally likely to experience long-term issues. Thus, numbers above 50 indicated a higher likelihood that the presence of ACEs would carry a negative long-term impact on the child living with trauma.

Table 2: Questions About the Long-Term Effects of ACE Exposure on Mental, Physical, and Social Health

Long-term effects of ACEs	Questions
Mental health	“Which child is more likely to abuse drugs or alcohol as an adult?” “Which child is more likely to never be diagnosed with depression or anxiety as an adult?” (R)
Physical health	“Which child is more likely to be diagnosed with cancer as an adult?” “Which child is more likely to be diagnosed with diabetes as an adult?” “Which child is more likely to suffer a stroke in adulthood?”
Social health	“Which child is more likely to drop out of school or to not complete college?” “Which child is more likely to be financially insecure in adulthood?” “Which child is more likely to hold a job as an adult?” (R) “Which child is more likely to engage in risky and illegal behaviors in adulthood?” “Which child is more likely to have a strong social network as an adult?” (R) “Which child is more likely to have a stable marriage?” (R)

Note: For each vignette, participants were asked which of the two children was more likely to be at risk for specific long-term problems. Ratings ranged from 0 to 100 with a score of 0 indicating the no-ACE-exposed child would be more likely to suffer from a particular ailment/problem to a score of 100 indicating the ACE-exposed child would be more likely to suffer from a particular ailment/problem, and a score of 50 with both children being equally likely to have long-term issues.

Each of our questions stemmed from empirical results of the long-term outcomes of ACEs reviewed above. Specifically, we asked participants to rate which of the two children would be more likely to abuse substances, be diagnosed with depression and anxiety, develop cancer or diabetes, have a stroke, drop out of high school or college, have unstable work situations, and romantic relationships, be financially insecure, have weak social networks, and engage in illegal behaviors as an adult.

We created separate indices to organize the perception of long-term outcomes. The mental health index consisted of the averaged responses for anxiety/depression and alcohol abuse for each vignette ($\alpha = .92$); the physical health index consisted of the average scores for cancer, stroke, and diabetes ($\alpha = .78$); the social health index

includes the average scores for education, job and family stability, financial security, social network, and risky behavior ($\alpha = .92$).

Data Analyses

We used the SPSS 25.0 software program (SPSS Inc., 2017) to conduct the mixed analyses of variance (ANOVAs) to examine between- and within-subjects differences. We also explored significant effects with follow-up simple effects analyses and pairwise comparisons (with the Bonferroni correction).

RESULTS

The Overall Perception of the Long-Term Effects of ACEs

We first predicted participants would be aware of the long-term consequences of adversity but more so about the potential mental and social health consequences than the burden on physical health. We averaged the different types of abuse (emotional, physical, sexual, and the three combinations of abuse) into a single “abuse” category. We also averaged all types of household dysfunction (having a parent incarcerated, witnessing domestic violence, parental drug or alcohol abuse, and divorce) into a single “household” dysfunction category. We analyzed the data in a 2 x 2 x 3 mixed factorial design in which ethnicity (Blacks, Whites) was the between-subjects factor, and ACE category (abuse and household dysfunction) and the perception of long-term outcomes (mental health, physical health, and social health) were the two within-subjects variables.

The ACE category x outcome perception interaction was significant, $F(2, 304) = 34.73, p < .001, \eta_p^2 = .19$, and follow-up analyses showed that for both abuse and household dysfunction, participants judged that the child with ACEs would be more at-risk for negative long-term effects on their mental health than both physical and social health, and more at risk for social health than for physical health, $ps < .001$ (see Tables 3a and 3b). Participants perceived that abuse was more likely to cause adverse outcomes than household dysfunctions ($p < .001$ for mental and social long-term outcomes; $p = .006$ for physical health). A significant ethnicity x perception of long-term outcome interaction, $F(2, 304) = 4.78, p = .009, \eta_p^2 = .03$, and follow-up tests indicated that White participants attributed more negative social health ($M = 69.41, SD = 9.41$) than Black participants ($M = 66.06, SD = 11.34$), $p = .049$, but the two groups did not differ for mental health (Whites: $M = 77.29, SD = 8.39$; Blacks: $M = 75.14, SD = 10.22$) and physical health outcomes (Whites: $M = 54.63, SD = 5.46$; Blacks: $M = 55.71, SD = 6.76$).

Table 3a: Mean Scores (SD) for the Long-Term Consequences of ACEs on Mental, Physical, and Social Health for Black Participants

ACE vignettes	<u>Mental health outcomes</u>		<u>Physical health outcomes</u>		
	Substance abuse	Depression/Anxiety	Cancer	Diabetes	Stroke
<i>Abuse</i>					
Emotional	75.00 (18.01)	80.49 (14.29)	53.30 (10.71)	57.32 (13.97)	60.73 (15.76)
Physical	77.57 (16.98)	78.06 (16.26)	52.91 (7.57)	55.88 (13.63)	58.71 (15.91)
Sexual	75.09 (19.87)	79.60 (15.05)	52.48 (12.92)	54.45 (11.57)	58.58 (14.82)
Emot/Physical	79.62 (16.01)	76.60 (16.27)	53.56 (10.84)	54.40 (14.98)	60.95 (16.82)
Emot/Sexual	78.52 (18.15)	78.91(16.32)	52.32 (12.22)	55.23 (14.02)	59.58 (14.72)
Phys/Sexual	77.53 (19.08)	79.14 (16.62)	55.43 (11.74)	56.47 (13.99)	61.57 (17.53)
<i>Household Dysfunction</i>					
Divorce	65.19 (118.38)	68.88 (16.50)	52.13 (8.09)	54.55 (11.39)	54.17 (13.05)
Alcohol abuse	73.35 (22.15)	73.56 (16.92)	55.77 (13.48)	55.64 (14.08)	60.95 (15.69)
Drug/medication	78.52 (19.31)	74.79 (17.10)	57.78(14.40)	58.32 (14.57)	61.03 (17.35)
Mental illness	71.65 (18.77)	72.75 (17.71)	53.14 (7.85)	55.91 (12.72)	56.36 (12.92)
Incarceration	69.53 (17.58)	69.44 (16.39)	51.27 (7.47)	52.61 (10.26)	55.30 (11.74)
Witness parental abuse	73.38 (19.02)	77.70 (15.90)	52.08 (5.48)	55.10 (11.65)	56.71 (13.54)

ACE vignettes	<u>Social health outcomes</u>					High school/ College dropout
	Unstable job	Weak social network	Financial insecurity	Illegal behavior	Unstable marriage	
Abuse						
Emotional	64.47(18.61)	68.61 (20.10)	57.92 (25.23)	72.42 (19.65)	69.81 (20.43)	69.74 (18.07)
Physical	63.73 (19.73)	69.84 (21.07)	60.71 (22.35)	73.09 (19.76)	71.00 (19.12)	69.22 (17.82)
Sexual	62.95 (18.47)	69.92 (21.29)	61.61 (21.24)	75.10 (18.47)	70.25 (20.30)	71.09 (17.61)
Emot/Physical	63.04 (18.78)	67.25 (21.71)	59.91 (23.80)	75.10 (17.88)	71.58 (21.11)	74.57 (18.41)
Emot/Sexual	63.64 (19.72)	70.58 (20.74)	58.12 (21.13)	73.96 (18.93)	69.62 (21.57)	71.88 (18.01)
Phys/Sexual	61.88 (19.62)	68.25 (20.38)	58.62 (21.64)	70.94 (19.53)	68.74 (21.70)	69.32 (19.07)
Household dysfunction						
Divorce	54.14 (17.19)	58.01 (16.03)	56.69 (14.67)	69.30 (17.99)	65.88 (20.89)	60.55 (14.58)
Alcohol abuse	61.38 (19.71)	66.10 (19.02)	60.58 (22.63)	75.19 (18.20)	66.56 (20.43)	70.82 (17.79)
Drug/medication	64.82 (21.82)	67.61 (18.67)	63.43 (23.35)	73.75 (20.86)	64.48 (23.23)	71.90 (19.68)
Mental illness	62.94 (19.70)	63.81 (22.35)	57.79 (20.81)	67.25 (19.72)	63.83 (19.38)	70.26 (17.97)
Incarceration	60.34 (18.24)	59.78 (18.88)	59.31 (20.34)	69.21(21.20)	61.94(17.57)	69.22 (17.05)
Witness parental abuse	64.65 (18.38)	67.90 (18.97)	56.09 (20.46)	70.19 (19.13)	70.31 (21.85)	70.52 (17.90)

Note: $n = 79$ except for parental incarceration, emotional abuse, physical abuse, sexual/emotional abuse ($n = 80$), and for parental alcohol abuse, mental illness, witness abuse ($n = 78$). Scores above 50 indicate a child with an ACE was more likely to have long-term consequences than a child without an ACE and scores below 50 indicate the opposite.

Table 3b: Means (SD) for the Long-Term Consequences of ACEs on Mental, Physical, and Social Health for White Participants

ACE vignettes	<u>Mental health outcomes</u>		<u>Physical health outcomes</u>		
	Substance abuse	Depression/Anxiety	Cancer	Diabetes	Stroke
Abuse					
Emotional	73.76 (14.45)	77.85 (13.23)	52.28 (5.78)	54.55 (10.10)	55.57 (11.66)
Physical	77.59 (13.75)	80.15 (12.56)	52.78 (7.57)	54.99 (9.52)	58.34 (12.84)
Sexual	80.22 (14.43)	80.55 (13.63)	51.89 (8.14)	55.03 (12.39)	55.32 (11.61)
Emot/Physical	80.38 (14.19)	81.69 (14.44)	53.36 (7.63)	55.85 (9.75)	57.65 (11.20)
Emot/Sexual	80.78 (14.28)	83.12 (12.44)	53.26 (8.93)	56.09 (11.04)	58.7 (12.95)
Phys/Sexual	83.11 (12.86)	83.47 (12.53)	52.84 (6.29)	56.68 (10.72)	58.78 (10.70)
Household Dysfunction					
Divorce	66.57 (13.50)	69.03 (15.76)	50.62 (5.63)	52.42 (9.17)	52.3 (6.27)
Alcohol abuse	82.47 (12.78)	76.55 (13.24)	56.27 (9.80)	56.43 (10.16)	58.15 (12.10)
Drug/medication abuse	83.03 (16.21)	76.38 (13.92)	56.16 (10.21)	54.93 (8.22)	57.39 (11.29)
Mental illness	70.28 (15.52)	78.34 (14.16)	51.11 (4.56)	55.31 (10.6)	55.24 (9.77)
Incarceration	69.69 (14.27)	69.73 (13.43)	51.45 (4.70)	52.24 (7.91)	52.93 (6.97)
Witness parental abuse	73.96 (14.57)	76.36 (12.03)	51.43 (5.28)	53.05 (8.94)	55.16 (10.54)

ACE vignettes	Unstable job	Weak social network	Social health outcomes		Unstable marriage	High School/ College dropout
			Financial insecurity	Illegal behavior		
Abuse						
Emotional	64.69 (17.61)	70.36 (14.70)	62.88 (16.54)	70.58 (15.26)	69.92 (17.41)	70.7 (15.01)
Physical	71.14 (16.40)	71.30 (16.19)	65.22 (17.40)	74.15 (16.29)	76.11 (15.42)	74.47 (14.14)
Sexual	69.55 (18.09)	72.61 (17.14)	64.89 (18.31)	75.54 (13.71)	72.32 (23.28)	73.86 (17.4)
Emot/Physical	72.01 (14.19)	73.34 (14.46)	65.51 (20.35)	75.95 (15.76)	75.73 (15.53)	75.19 (15.77)
Emot/Sexual	71.22 (16.39)	72.03 (17.36)	65.57 (18.31)	73.19 (18.17)	71.19 (23.02)	74.11 (14.88)
Phys/Sexual	72.01 (16.11)	74.97 (15.44)	67.91 (16.52)	77.95 (14.20)	75.82 (18.85)	77.34 (14.78)
Household Dysfunction						
Divorce	57.09 (16.22)	55.18 (16.59)	53.54 (16.64)	64.38 (12.47)	68.11 (21.87)	61.05 (14.25)
Alcohol abuse	68.77 (17.41)	66.03 (16.84)	67.18 (14.75)	73.26 (15.22)	65.04 (17.44)	71.7 (14.28)
Drug/medication	72.76 (15.94)	72.22 (16.94)	68.34 (19.89)	79.22 (15.65)	70.18 (17.23)	76.14 (14.61)
Mental illness	63.85 (16.92)	67.18 (16.84)	63.41 (14.83)	67.55 (15.34)	63.26 (17.45)	68.12 (15.13)
Served time	64.12 (16.90)	65.68 (14.53)	64.38 (16.33)	71.34 (17.45)	64.99 (16.69)	70.14 (15.09)
Witness parental abuse	66.12 (15.67)	67.14 (16.62)	63.62 (17.93)	71.57 (14.03)	74.95 (19.68)	68.61 (17.12)

Note: $n = 74$. Scores above 50 indicate a higher likelihood for a child with an ACE to have long-term consequences than a child without an ACE and scores below 50 indicate the opposite.

Long-Term Perception of the Effects of Specific Types of Abuse

We then looked more specifically at how our participants judged the effects of the different types of abuse on long-term health in a 2 x 3 x 6 mixed factorial design with ethnicity (Blacks, Whites) as the between-subjects factor and type of abuse (physical, sexual, emotional, and the three combinations) and perception of long-term outcomes (mental health, physical health, and social health) as the two within-subjects variables (see table 4). The 3 two-way interactions were significant [abuse type x ethnicity, $F(5, 750) = 3.54, p = .004, \eta_p^2 = .03$; outcome x ethnicity, $F(1.64, 245.44) = 3.99, p = .03, \eta_p^2 = .027$, perception of outcome x abuse type, $F(8.99, 1347.87) = 1.92, p = .045, \eta_p^2 = .013$]. Pairwise comparisons indicated, as before, White participants judged the risk for negative long-term social health outcomes to be higher than Black participants, $p = .046$, but both groups rated the risk for negative physical health lower than for mental or social health and rated the risk for adverse mental health higher than social health, all $ps < .001$. Participants also believed that emotionally abused children would be less at risk for later adverse mental health problems than children who suffered combinations of abuse, such as sexual and emotional abuse ($p = .039$) or physical and sexual abuse ($p = .009$). Similarly, participants perceived that childhood sexual abuse had lower costs in terms of later physical health issues compared to the combination of physical and sexual abuse, $p = .025$.

Table 4: Mean Scores (SD) for Each Specific Type of Abuse as a Function of Long-Term Outcomes (Mental, Social, Physical Health) and Ethnicity.

		Long-term outcomes		
		Mental health	Social health	Physical health
Emotional abuse	Black pp	77.85 (13.93)	67.50 (14.01)	57.01 (10.20)
	White pp	75.80 (11.57)	68.19 (11.53)	54.14 (7.61)
Physical abuse	Black pp	78.05 (14.65)	68.08 (14.11)	55.75 (10.11)
	White pp	78.87 (12.02)	72.06 (10.84)	55.37 (7.61)
Sexual abuse	Black pp	77.52 (14.91)	68.73 (14.29)	55.12 (12.02)
	White pp	80.39 (12.75)	71.46 (13.42)	54.08 (8.28)
Emot/Phys abuse	Black pp	78.22 (14.65)	68.66 (13.90)	56.20 (11.27)
	White pp	81.03 (13.03)	72.95 (12.04)	55.62 (7.49)
Emot/Sex abuse	Black pp	78.95 (15.64)	68.31 (15.15)	55.65 (10.05)
	White pp	81.95 (12.06)	71.22 (13.35)	56.02 (8.09)
Phys/Sex abuse	Black pp	78.60 (16.61)	66.56 (15.45)	57.73 (11.49)
	White pp	83.29 (11.68)	74.33 (11.93)	56.10 (7.69)

Note: Scores above 50 indicate a child with an ACE was more likely to have long-term consequences than a child without an ACE, and scores below 50 indicate the opposite.

Next, for social health outcomes, participants thought that children emotionally/physically abused would be more at risk than children emotionally abused, $p = .010$. The two samples differed in their perception of the overall long-term effects of physical/sexual abuse, with Black participants judging them to be less severe than the White samples, $p = .023$. Black participants did not see differences in long-term effects between the six types of abuse. For White participants, perceived physical abuse led to more severe social health outcomes than emotional abuse ($p = .02$) as did the combined types of abuse compared to emotional abuse ($ps < .001$), and physical/sexual abuse compared to sexual abuse ($p = .045$). As before, White participants also believed that child abuse was more likely to pose a threat to later mental health than to physical or social health and that it caused fewer problems for long-term physical health than for social health. (all $ps < .001$).

Effects of Specific Household Dysfunctions

Finally, we compared the perception of how the type of household dysfunctions could affect long-term health in a 2 ethnicity x 3 perception of long-term outcomes (mental, social, physical health) x 6 household dysfunction (divorce, alcoholism, parental incarceration, mental illness, drug abuse, witness abuse) mixed ANOVA. A significant triple interaction and follow-up analyses, $F(10, 1500) = 2.02, p = .03, \eta_p^2 = .013$, revealed differences between our two samples. Black participants predicted less dire long-term mental health consequences than White participants when having an alcoholic parent ($p = .020$), and social health consequences for children whose parents had a drug abuse problem ($p = .020$). In addition, Black participants believed that divorce was less likely to result in long-term mental health issues compared to most other household problems ($ps = .012$ or lower) except for serving time for both samples ($p = 1.00$) and mental illness for Black participants ($p = .08$). For White participants, parental alcohol abuse during childhood was deemed to lead to more severe later mental health issues than parental mental illness ($p = .049$), divorce, or parental incarceration ($p < .001$), but for Black participants, children whose parents abused alcohol were more at risk for long-term mental health issues than children whose parents divorced ($p = .017$). For both samples, parental drug abuse increased later mental health risk factors more so than parental divorce or parental incarceration ($ps = .001$), and witnessing parental abuse led to more risk for mental health issues than parental incarceration ($p = .025$ for White participants and $p = .004$ for Black participants). In terms of physical health consequences, for Black participants, parental drug abuse would carry more risk than divorce, parental incarceration, mental illness, and witnessing abuse (ps ranged from .016 to .002), whereas for White participants perceived parental drug abuse would lead to more negative outcomes than only divorce and parental incarceration ($ps = .042$ and .046). For social health consequences, White participants perceived parental drug abuse placed a child more at risk than all other household dysfunctions ($p < .002$), but for Black participants, parental drug abuse rendered a child more at risk for social health issues than divorce ($p < .001$) and incarceration ($p = .032$). Across the various household dysfunctions, both groups predicted overwhelmingly that a child with ACEs would be more at risk for long-term mental health problems than physical and social problems and more at

risk for long-term social struggles than negative physical outcomes ($ps < .001$). The only exception to this pattern was that for White participants having a parent serving time had similar effects on a child’s mental or social health ($p = .11$); see Table 5 for descriptive statistics.

Table 5: Mean Scores (SD) for Household Dysfunctions as a Function of Long-Term Outcomes and Ethnicity

	Divorce	Alcohol abuse	Drug abuse	Incarceration	Mental illness	Witness abuse	All household categories
<i>Mental health</i>							
Black	67.06 (15.31)	73.80 (17.63)	76.89 (15.87)	69.59 (14.83)	72.28 (16.42)	75.75 (15.44)	72.56 (11.59)
White	67.79 (12.45)	79.51 (11.60)	79.70 (13.14)	69.71 (12.39)	74.31 (11.42)	75.16 (11.69)	74.36 (8.25)
<i>Social health</i>							
Black	59.83 (11.01)	66.85 (14.06)	67.68 (15.28)	63.51 (13.31)	64.19 (14.76)	66.84 (13.11)	64.76 (11.07)
White	59.89 (11.01)	68.66 (12.61)	73.14 (13.09)	66.76 (12.22)	65.56 (12.97)	68.67 (11.59)	67.11 (9.69)
<i>Physical health</i>							
Black	53.55 (8.76)	57.35 (11.99)	59.04 (12.98)	53.01 (7.52)	55.04 (7.82)	54.67 (7.67)	55.42 (6.47)
White	51.78 (6.04)	56.95 (8.72)	56.16 (7.79)	52.21 (5.20)	53.89 (6.76)	53.22 (6.12)	54.03 (4.99)

Note: Scores above 50 indicate a child with an ACE was more likely to have long-term consequences than a child without an ACE, and scores below 50 indicate the opposite.

DISCUSSION

This work aimed to document beliefs and awareness of the long-term impact of ACEs in a diverse college-age population. Awareness of the cost of ACEs on mental health was high among our participants, with the ACE child always judged to be more at risk than the non-ACE child. As predicted, child abuse victims are considered more at risk for mental health problems than children living in a dysfunctional household, indicating participants established a hierarchy of severity for these various childhood situations. Even when we asked participants to compare single instances of abuse with household problems, they still believed that being in an abusive situation during childhood would put that child at a higher risk in adulthood. These findings are interesting to compare with the results of other researchers. For example, Purtle and colleagues (2019) polled Pennsylvania legislators on their opinions about the impact of specific adverse childhood experiences (sexual abuse, physical abuse, neglect, and

witnessing domestic violence) on later behavioral health. Their results indicated that whether these experiences would negatively impact the future depended partly on the legislators' political beliefs, with conservative lawmakers less likely to believe in long-term consequences. While we did not collect information about our participants' political leanings, we can surmise college students may not share the same beliefs (Havey & Schalewski, 2022; Lasher et al., 2022).

Regarding social health, our participants believed that a child with ACEs was more at risk for later social problems than physical health issues but less at risk for mental health issues. These perceptions align with the literature on the effects of early adversity on later life with increased relationship issues (Doyle et al., 2017) and crime and violence (Widom, 2017). Adverse childhood experiences may influence the individual to develop behavioral issues (e.g., socially inhibited, dominating behaviors, cold/distant, overly accommodating), causing dysfunction within interpersonal relationships (Huh et al., 2014). In adults with a history of childhood maltreatment, cognitive distortions may develop in which the individual distrusts and perceives threats when interacting with others (Hepp et al., 2021).

As predicted, we found our sample of participants did not well understand the ACEs consequences on physical health. For each vignette, including in the case of multiple cases of abuse, participants rated the risk for later physical health significantly lower than the risk for mental and social health. Scores were close to the midpoint, where both children were perceived to be at equal risk of having long-term issues, reflecting the participants' beliefs that ACEs would not have a high impact on later physical health. These results match the findings that other segments of the population are not well-informed about the long-term risk of early trauma on physical health. For example, physicians are often not aware of the associations between childhood experiences and mental and physical health (Maunder et al., 2020; Tink et al., 2017) and they lack training to ask questions in a sensitive and useful manner (Pletcher et al., 2019; Weinreb et al., 2010). These results are thus not surprising, given the lack of public health information. Still, they contrast with a solid body of empirical data on the risks of ACE-related medical problems (Hughes et al., 2017). Information about the risk for physical health is still mostly restricted to the research community. Our findings add relevance to the plea of former California surgeon General, Dr. Nadine Burke-Harris, on how educating the public is necessary to prevent and treat the consequences of early trauma (Trauma-Informed Care in Schools, 2019).

Our next question was about potential differences between our two samples. Because of the higher prevalence of ACEs in minority populations (Petrucci et al., 2019), we expected our sample of Black participants to show greater awareness of the long-term consequences of ACEs. We did find Black participants rated the ACE children as more likely to suffer damaging effects; however, in several instances, we found a lower perception of long-term risks among Black participants compared to White ones. For example, we found that Black participants perceived physical abuse to have less severe effects than White participants. Differences in the long-term effects of physical abuse could stem from cultural perceptions of corporal punishment (Taylor, 2011). Corporal punishment is prevalent and normalized in Black culture

and religion and is an acceptable method of discipline within many Black households (Chaney et al., 2015; Taylor, 2011).

Black participants considered the risk for negative consequences on social health to be lower than the other group overall. They also rated the risk for mental health issues for a child living with an alcoholic parent lower than White participants. Without specific demographic data, such as socio-economic status, family composition, etc., it is not easy to speculate why our Black participants would rate these situations as less consequential than White participants. However, one potential explanation for the difference could be because our Black participants were students in a social work college course. In contrast, White participants were students in an introductory psychology course. It is possible some of the differences we observed were due to a difference in training so that social work students understood more about how compensatory factors in the child's life (family, community, etc.) may mitigate or buffer early trauma.

Interestingly, we found differences in how the two groups ranked the severity of the different household dysfunctions. For example, while both samples agreed the mental and social outcomes of parental alcohol abuse would place a child more at risk than parental divorce, for Black students, parental alcohol abuse was only worse than having a parent incarcerated for long-term physical health. By contrast, White participants rated parental alcohol abuse as more likely to predict later mental, physical, and social health issues compared to most other ACEs. National statistics indicate higher levels of alcohol abuse in the White population and, thus, possibly our results reflect some knowledge of the consequences in our participants (Delker et al., 2016). The findings on drug abuse also revealed some differences between the two samples. Black participants rated parental drug abuse to be more likely to place a child at risk for physical health problems than all other ACEs. However, for White participants, the risk was considered more severe for social health compared to all other ACEs. The difference in perceived risk may be a direct result of the criminalization of drug abuse in Black communities versus the victimization of drug abuse in White communities. Therefore, Black participants may have a sense of desensitization towards social consequences because of the history of the crack cocaine epidemic within Black communities (Lehrner & Yehuda, 2018). By contrast, the opioid epidemic is significantly impacting White suburban middle-class communities for the first time (Gollust & Haselswerdt, 2021). White participants' exposure to the social challenges of drug abuse may be new to them, and those vignettes may have a more significant cost associated with them.

Divorce scores were closer to the midpoint, reflecting the frequency of divorce in our society and the direct knowledge of its impact. As predicted, divorce or parental separation was seen as less costly than all ACEs except for parental incarceration for both samples. These results are interesting given that parental divorce or separation is one of the most common adverse childhood experiences (Sacks & Murphey, 2018) and is associated with significant negative consequences on mental health (Auersperg et al., 2019). We considered how the perception of the lower long-term impact of divorce compared to other ACEs in our sample might be because of reduced stigma of parental divorce or better parental management of divorce (see Finkelhor et al., 2013).

For both samples, parental mental illness was surprisingly not perceived to be costly compared to the other ACE categories. For Black participants, the cost of parental mental illness was either lower or did not differ from other household ACEs. In contrast, White participants considered it to pose a risk to a child's long-term health only compared to divorce, specifically affecting mental and social health. Familiarity with mental illness is associated with a lower perception of its danger (Link & Cullen, 1986) and increased empathy (Angermeyer & Matschinger, 1996). Data from the [2019 National Survey on Drug Use and Health](#) (NSDUH) by the [Substance Abuse and Mental Health Services Administration](#) (SAMHSA) estimate 20.6% of the US population suffers from a mental illness, and college students' rate of mental illness is estimated to be 50 % (SAMSHA, 2020). It is thus plausible a non-negligible percentage of our participants had direct experience with mental illness, and this experience informed their estimation of its dangers. However, these results contrast with data indicating that growing up with a mentally ill parent leads to 3 times the risk of suffering from anxiety disorders, major depression, and drug abuse, especially in young adulthood (Weissman et al., 2006). Public understanding of mental illness and its effects indicates a lack of information and negative stigma, for example, lower employment rates and housing challenges faced by this population (DeFreitas et al., 2018). Nationally, ethnic minorities are more likely to suffer from mental health issues (Corrigan et al., 2016), but they are also less likely to seek help via conventional treatment because of stigma and discrimination (Alang, 2019; DeFreitas et al., 2018) and lack of cultural sensitivity in the types of therapies offered (French et al., 2020). Published research may not reflect the variety of ways ethnic minorities seek help, for example, via spirituality or other unconventional methods (Haynes et al., 2017).

Limitations

A limitation of this study was the absence of demographic information such as socio-economic status and ACE scores, which would have allowed us to better understand the differences between the two samples. It is plausible the differences in the trauma history of our participants influenced vignette responses. Gathering qualitative data would allow for a more refined understanding of people's perceptions of the long-term effects of childhood trauma.

Secondly, although both student groups were students in behavioral health and all were undergraduate students, they were recruited from institutions distinct from one another because of regional location and contrasting institutional classification (comparing a PWI to an HBCU). We are aware that these distinctions may include factors of influence not fully accounted for in the results of the study. Further research on this topic should explore these potential factors.

Finally, we considered the possibility that the age difference in the two sample groups influenced the study's results. While this is a possibility, this age difference did not significantly affect our results because when we re-analyzed our data without six students older than 22 years of age, our statistical results held, indicating that these older students did not change the pattern of results. Also, only one student was a non-traditional student, and five were 24 years old, so most of our sample was still within

the traditional age range of college students. Still, a more homogenous population would have allowed for a more refined understanding of college students' knowledge of the long-term consequences of ACEs.

CONCLUSION

Overall, our results point to the awareness of the risks and costs of early trauma for long-term mental and social health. They also indicate a limited understanding of the risks of childhood adversity for later physical health. Appropriate and culturally sensitive public health education can lead to the prevention of the intergenerational transmission of trauma and to effective healing interventions designed to alter life trajectories (Larkin et al., 2014). Institutions should develop education and intervention programs at the college level to increase awareness. For example, Ford et al. (2021) found that presenting an animated film about ACEs led to an increase in the awareness of ACEs among professionals. Such interventions, coupled with increased availability for screening, referrals, counseling, and curricula for health professionals (Steen et al., 2022) could lead to greater awareness and prevention of the long-term effects of ACEs. Public health education is necessary to implement policy change, but recent findings also point to the potential increase in stigma and stereotypes toward ACE survivors. In a recent study, Gollust et al. (2022) found that awareness of the economic cost of ACEs led to shifts in attitude and increased parental blame. Emphasizing other aspects of ACEs' consequences, such as the biological consequences or racial inequity, led to attitude change.

Considering trauma has impacted an estimated 60 percent of the public, trauma-informed practices, and education should be a public health priority for higher education institutions (CDC, 2019; Merrick et al., 2018). In the last decade, research on the adverse effects of childhood trauma influenced the development of trauma-informed pedagogy focused on primary and secondary education classrooms (U.S. Department of Health and Human Services, 2019). A trauma-informed care approach and curriculum within higher education would address the impact of ACEs. Future research among students in higher education, faculty, administrators, and policymakers is needed to identify gaps in learning, student cultural needs, barriers in the curriculum, testing, and training needs.

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