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Participatory Research Study

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Abstract

Researchers and youth stakeholders devised a survey on 27 adversities based on youth expertise, clinical practice, and adversity literature. The aim of the study was to understand the prevalence of individual and cumulative adversities, and association of adversities to age, gender, race/ethnicity and academic performance among a community sample of urban high school students. All participants experienced two or more adversities and experienced greater overall adversity than youth in population-based studies. Youth-proposed stressors were among the most prevalent, and females, older youth, and African American youth reported disproportionately greater number of adversities. Specific types of adversities were endorsed differentially based on gender and race/ethnicity. Adversity score and most adversities were not associated with academic performance, with the exception of youth substance abuse and bullying victimization which were respectively positively and negatively correlated. Future research should explore protective factors for academic success despite high adversity, as well as continued integration of youth voice in research.

Keywords: child adversity; adverse childhood experiences; academic functioning; school performance; community-engaged research

Childhood adversities, including Adverse Childhood Experiences (ACEs), are stressful and potentially traumatic events that include abuse, neglect, and household dysfunction, as well as experiences outside of the home, such as bullying, community violence, and peer violence (Bucci, Gutierrez Wang, Koita, Purewal, Marques, & Burke Harris, 2015; Felitti et al., 1998; World Health Organization [WHO], 2017). Up to 48% of youth in nationally representative studies are exposed at least one adversity during childhood and 23% report two or more types of ACEs (Bethell, Newacheck, Hawes, & Halfon, 2014). In juvenile justice settings, the prevalence of an adverse experience is as high as 97%, with 50% of youth reporting four or more adversities (Baglivio, Eipps, Swartz, Huq, Sheer, & Hardt, 2014).

To establish a better understanding of childhood adversity, researchers have attempted to differentiate the prevalence of adversity according to demographic factors such as age, gender and race/ethnicity. Research on the basis of age has been limited and conflicting. For example, Wing, Gjelsvik, and Nocera (2015) reported greater prevalence of 1, 2, 3, 4, and 5+ ACEs for youth aged 12-17 compared to youth age 0-5 or 6-11. However, Flaherty and colleagues (2013) found that children age 0-6 experience 2, and 3+ adversities at greater prevalence than youth age 6-12 or 13-14; types of adversities were also reported with the majority of adversities occurring between age 0 and 6 in this study sample. The literature on gender and race/ethnicity in relation to adversity appears more robust and consistent. Specific types of adversities seem to be experienced by females rather than males (and vice versa). For example, urban high school girls have reported greater sexual abuse or assault and serious neglect, while boys were more likely to report being threatened with a weapon, held captive or kidnapped, physically assaulted, and having witnessed injury/murder (Schilling, Aseltine, & Gore, 2007). Another study confirms the greater likelihood of sexual trauma for female adolescents and more physically violent types of

trauma for males (Salazar, Keller, Gowen, & Courtney, 2013). Furthermore, in a large adult sample, a greater proportion of women recalled childhood sexual abuses than men, whereas reports of physical assault and witnessing violence were more prevalent among men (Centers for Disease Control and Prevention [CDC], 2016; Tolin & Foa, 2006).

Generally, the literature supports the notion that minorities experience disproportionate early life stressors. Of ten adversities assessed among high school youth, Hispanic and Black youth surpassed White youth in eight (Schilling et al., 2007). In additional research, Latino and African American students were more likely to report experiencing 1, 2, 3, and 4+ Adverse Childhood Experiences (ACEs) compared to White students, (Minnesota Department of Health & Minnesota Department of Human Services, 2014) Research on adults similarly demonstrates greater accounts of childhood adversity for African Americans compared to their White counterparts (Slopen et al., 2010; Umberson, Williams, Thomas, Lio, & Thomeer, 2014).

The consequences of adverse childhood experiences extend multiple domains of functioning. Adversities have been linked to poor mental, physical, and behavioral well being, with outcomes such as anxiety, aggressive behavior, eating disorders, and somatic concerns more prevalent among impacted youth (Flaherty et al., 2013; Johnson, Cohen, Kasen, & Brook, 2002; Lansford, Dodge, Pettit, Bates, Crozier, & Kaplow, 2002; Margolin, Vickerman, Oliver, & Gordis, 2010). Furthermore, childhood adversity has also been associated with various outcomes among adults, including many leading causes of death, such as heart disease and cancer, as well as premature mortality (Brown et al., 2009; Felitti et al., 1998; Kalmakis & Chandler, 2015). In both child and adult samples, a dose-response relationship has been documented, with increased likelihood of conditions such as asthma, obesity, dental health, chronic bronchitis or emphysema,

skeletal fractures, and poor self-rated health in response to greater numbers of adversities (Bethell et al., 2014; Bright et al., 2015; Felitti et al., 1998).

The relationship between adversity and academic outcomes has also been well studied but has drawn some unclear conclusions. For example, McMillen and colleagues (2003) found an insignificant association between maltreatment history and failing a class but a significant positive relationship between maltreatment history (physical abuse, physical neglect, emotional abuse) and repeating a grade. Coohey and colleagues found that chronic maltreatment rather than maltreatment type impacted math scores. Caregiver mental health, caregiver substance abuse, maltreatment severity and chronic maltreatment did not significantly affect reading scores whereas domestic violence and type of maltreatment (physical abuse, physical neglect, supervisory neglect) did (Coohey et al., 2011). Furthermore, literature on adversity and academic performance has largely focused on single exposures (i.e. peer aggression, familial conflict, community violence) and often does not account for many different stressful experiences that youth may face across home, school, community settings, and their cumulative impact on academic outcomes (Borofsky, Kellerman, Baucom, Oliver, & Margolin, 2013; Espinoza, Gonzales, & Fuligni, 2013; O'Malley, Voight, Renshaw, & Eklund, 2015).

Strong academic performance has been documented to be a protective factor in the context of adversity; for example, strong academic performance has played a positive role in protecting youth from substance abuse and violence, and can impact success of mental health treatment later in life (Elkit, 2015; Fothergill & Ensminger, 2006; Park, Weaver, & Romer, 2009; Rajendran & Videka, 2006; Rose, Espelage, Monda-Amaya, Shogren, & Aragon, 2015). Given the benefit of academic performance to short and long-term well being for traumatized youth, this research topic requires further attention. Due to mixed findings in regard to the

relationship between adversity and academic outcomes, and the limited types of adverse

exposures studied, we aim to understand how cumulative and different types of childhood

adversities are associated with academic performance among youth. We accomplish this goal

through engaging youth in establishing a comprehensive understanding of stress from their

perspective. Furthermore, we attempt to understand how adverse experiences differ for youth

according to gender, race/ethnicity and age as a means to expand the knowledge base on

adversity and socio-demographic factors.

Method

Using principles of community-based participatory research (CBPR) and youth

participatory action research (YPAR), researchers at the Center for Youth Wellness (CYW) and

youth from H2O Productions in Northern California, both working to mediate the harms of early

adversity, collaborated to implement a research study to understand stressors faced by youth.

CBPR emphasizes empowerment and equity in sharing of knowledge and skills to create change

through research and action. Community members and researchers work together to design and

implement the various stages of the research process to understand and act upon an issue of

concern to the community (Israel, Schulz, Parker, & Becker, 1998; Minkler & Wallerstein,

2003). YPAR, focusing specifically on the role of youth in research, allows youth to explore

social problems that impact their lives, and similar to CBPR, identifies solutions and implement

action to address problems (Cammarota & Fine, 2008).

CYW is a health organization that works with the Bayview Child Health Center to

implement an integrated pediatric model of care to screen and treat children and adolescents

exposed to adversity. With clinical, research, and advocacy efforts, CYW aims to understand,

evaluate and promote best practices for routine screening and treatment of youth in the pediatric primary care setting (Purewal et al., 2016).

H2O Productions is a comprehensive arts and social justice based program that focuses on the development of agency and pathways for high school youth. H2O has partnered with a charter high school to create a cohort-model that provides youth with critical research methodologies and tools to inform and impact their economic conditions such as critical thinking, cultural awareness, academic engagement, self-expression, and self-efficacy.

Participants and procedures

Between October 2015 and February 2016, H2O Productions staff entered 9th-12th grade classroom advisory periods at an urban Northern California High School to introduce the research study and disseminate English and Spanish consent forms to students. After explanation of the study's procedures, high school students had 2-3 weeks to obtain parent consent.

All ninth-12th grade students at the school with student body size of approximately 300 students were recruited; students were eligible to participate if (1) they were currently enrolled in the focal high school, (2) if their parent/guardian consented to their participation, and (3) if the student self-assented to participation. The final study sample (n=92) consisted of students who identified primarily as Latino, mixed race, and African American. Approximately 27% of youth reported at least part African American identity and 73% reported part or full Latino background. A slightly greater proportion of the sample identified as females (54%) versus males (46%). Age was normally distributed with mean 15.61 (SD=1.37). Approximately 48% of students were enrolled in the 9th (24%) and 10th grade (24%); 12% of students were 11th graders, and 40% of students were in the 12th grade. Participating students were reflective of the school's

race/ethnicity and gender demographics, however grade level proportions were not representative of the school's student body population. See Table 1 for sample characteristics.

Upon confirmation of parental consent, student participants were asked to accompany H2O Productions staff and CYW research staff to a computer classroom where they were provided with an overview of the study and assenting process, and shown an educational video about ACEs developed by student researchers titled "Toxic Stress, Toxic Streets" (H2O Productions, 2014). Students who agreed to participate remained in the computer lab and completed the assent form and web-based, self-administered anonymous survey. After completion, participants were provided with a list of community resources and hotline number in case of triggering feelings.

Measures

Student researchers expressed that a priority of the study be to understand potential disparities by socio-demographics, citing that particular groups may experience disproportionate stressors. Socio-demographic variables included: age, grade level, gender ("female", "male", "genderqueer or transgender", and "decline to state") and race/ethnicity, which was studied comprehensively. "Ethnicity" consisted of "Hispanic or Latino", "Non Hispanic or Latino," "Decline to state" and participants were asked to select all racial categories that applied to them ("Black or African American," "American Indian and Alaska Native," "Far East Asia," "Southeast Asia," "Indian Subcontinent of Asia, "Native Hawaiian," "Pacific Islander," "White," "Mixed Race," "Decline to state"). Finally, a fill-in option for self-identified race was provided.

Recently having learned about the social determinants of health and recognizing the positive impact of education on health, students proposed to incorporate academic performance into the survey. Academic performance was measured through self-reported grade point average

(GPA) as: Mainly A's (3.5-4.0), Mainly B's (2.5-3.4), Mainly C's (1.5-2.4), Mainly D's (0.5-1.4), Mainly F's (0.0-0.4). Self-reported GPA has been considered to be a reliable measure of academic performance in other studies (Crockett, Schulenberg, & Petersen, 1987).

Exposure to 27 different adversities was assessed through dichotomous (No/Yes) variables. Ten adversities were derived from the instrument developed by Felitti and colleagues in their seminal work on ACEs (Felitti et al., 1998). An additional 17 adversities were added based on student proposals to account for more diverse types of stressors based on personal experiences and experiences of peers in home, neighborhood, school, and community settings. See Table 2 for a list of all adversities assessed.

Data management and analysis

Data was imported through the web-based survey application, SurveyMonkey, into Microsoft Excel where it was cleaned and managed by CYW researchers. All data was analyzed using STATA version 14.1. The 27 adversity types were analyzed as individual dichotomous variables, and as continuous variables with two cumulative adversity scores: (1) a count of the original 10-item ACEs (0-10), and (2) a count of all adversities (0-27).

Due to the high proportion of mixed race students, the race/ethnicity variable was adjusted from a single multi-categorical variable to multiple dichotomous variables to account for unique experiences of identifying with a particular ethnicity (i.e. African American vs. non-African American). GPA was dichotomized into "high performance" (Mainly A's, Mainly B's) versus "low performance" due to few students reporting C's, D's and F's. Gender, race/ethnicity variables, grade level, GPA and dichotomous adversity types were summarized using frequencies and percentages. Age and adversity scores were described using mean, median, and standard deviation. Bivariate relationships between categorical variables were evaluated using

chi square tests. Relationships between categorical and continuous variables were analyzed using t-tests. Bivariate continuous associations were analyzed using the Pearson correlation (Bush, 2012). Relationships were statistically significant if p<0.05.

The study protocol was reviewed by CYW's Community Advisory Council prior to submission to an IRB for review and approval. The study protocol was subsequently approved by Western Institutional Review Board and by the school district's Research, Planning, and Accountability office; permission was received by the high school's principal and teachers were notified and asked of permission to distribute study consent forms in classrooms. Participants did not receive compensation or incentive for participating in the study.

Results

All students experienced at least 2 of the 27 total adversities. Approximately 92% of students reported experiencing at least 1 of 10 original ACEs. On average, students reported experiencing 3.89 original ACEs [SD=2.58]. With respect to the 27 total adversities, students reported an average of 10.67 [SD=4.68] adversities. Both total and original ACE scores followed a standard normal distribution. Compared to ACE data on adults and national ACEs data among youth, study participants reported a greater proportion of adversities (see Table 3).

Leading adversities (≥50%) include: peer incarceration (85%), peer substance abuse (84%), family member death (76%), community violence (74%), peer mental illness (68%), domestic violence (59%), parent separation/divorce (57%), and school violence (50%). See Figure 1 for more details.

Age and adversity

Age was positively associated with both the number of original ACEs (r=0.24, p<0.05) and with the total adversities (r=0.32, p<0.01) such that older age was associated with a greater

number of adversities. Considering specific types of adverse experiences, significant associations were seen between older students and: physical neglect (16.9(SD=0.97) vs. 15.74(SD=1.38), p<0.01), police harassment (16.38(SD=1.4) vs. 15.66(SD=1.31), p<0.05), peer incarceration (16.09(SD=1.29) vs. 14.56(SD=1.41), p<0.01), household member incarceration (16.31(SD=1.37) vs. 15.59(SD=1.32), p<0.05), peer substance abuse (16.05(SD=1.31) vs. 15.2(SD=1.47), p<0.05), youth substance abuse (16.68(SD=0.89) vs. 15.69(SD=1.42), p<0.05), youth incarceration (17.14(SD=0.69) vs. 15.82(SD=1.37), p<0.05), community violence (16.14(SD=1.27) vs. 15.17(SD=1.47), p<0.01), and school violence (16.26(SD=1.22) vs. 15.53(SD=1.44), p<0.01). See Tables 4, 5A, 5B for associations of socio-demographics and academic performance to ACEs and youth-proposed adversities.

Gender and adversity

Females reported a significantly greater number of mean ACEs (4.49 [SD=2.56]) than males (3.21 [SD=2.49]), p<0.05. Although females reported a greater mean number of total adversities [11.29, SD=4.57] than males [10.02, SD=4.85], this difference was not statistically significant. With respect to specific adversities, females were significantly more likely to report emotional abuse (51% vs. 19%, p<0.01), emotional neglect (57% vs. 30%, p<0.05), sexual abuse (24% vs. 2%, p<0.01), and being bullied (44% vs. 24%, p<0.05) compared to males. Males were significantly more likely to report incarceration (15% vs. 2%, p<0.05), death of a peer (54% vs. 32%, p<0.05) and being harassed by a police officer (52% vs. 21%, p<0.01) than females.

Race/ethnicity and adversity

African American youth generally experienced greater doses of adversity compared to non-African American youth, with a mean ACE score of 4.28(SD=2.19) vs. 3.75(SD=2.72) and total adversity mean score of 11.92(SD=4.41) vs. 10.21(SD=4.72), however these findings were

not statistically significant. African American youth experienced significantly greater household member incarceration (75% vs. 39%, p<0.01), domestic violence (76% vs. 52%, p<0.05), CPS involvement (46% vs. 14%, p<0.01), police harassment (56% vs. 27%, p<0.05), and parent/guardian death (28% vs. 4%, p<0.01) than non-African American youth. Latino youth were significantly more likely to report emotional abuse compared to non-Latino youth (42% vs. 20%, p<0.05).

Academic performance and adversity

Most students reported Mainly A's (34%) and Mainly B's (44%). High performers (Mainly A's and B's) who consisted of 78% of the sample were compared with low performers (Mainly C's, D's, or F's) or 22% of the sample. While youth who reported C's, D's or F's had a greater mean number of ACEs (4.3 [SD=2.53]) than youth who reported A's and B's (3.8 [SD 2.79]), the difference did not reach a level of significance. This finding is also true for total adversities where students with A's and B's had an average total adversity score of 10.6 [SD=4.54] compared to a score of 11.3 [SD=5.02] for students with C's, D's and F's. Thus, the number of adversities experienced was not statistically associated with academic performance in this sample.

Considering specific adversities, youth substance abuse and bullying victimization were significantly associated with academic performance, p<0.01 and p<0.05 respectively. Approximately 44% of low performers reported drug abuse compared to 16% of high performers, indicating an inverse association between drug abuse and academic performance. Bullying victimization and high academic performance demonstrated a significant positive association with 40% of high performers reporting bullying victimization compared to 15% of low performers.

Discussion

Youth attending an urban high school reported excessive exposure to adversities in comparison to national data. Although it is important to urge caution when drawing conclusions due to differences in data collection methods and sample characteristics, the differences were as much as four times greater in some instances. Disparities of adversity exposure across age, gender, and race/ethnicity were also found, and the association between adversity and academic performance revealed that two specific adversities were associated with academic outcomes.

Females reported greater adversity and each gender reported experiencing unique types of adversities in line with literature (CDC, 2016; Schilling et al., 2007; Tolin & Foa, 2006). Student researchers sought to provide explanation for results and engaged concepts of social constructs of gender; female student researchers indicated that a natural tendency to be intuitive and emotional played a role in identifying with particular experiences (i.e. emotional neglect and bullying). Male student researchers admitted that they felt less open and confident in revealing stressors to assure masculinity; admittance of stressors implied a sign of weakness and vulnerability, which they felt they must protect. Research on gender differences and disclosure of sexual abuse confirms that boys are less inclined to report abuses due to socialization factors (Faller, 1989).

Greater adversity was associated with older age for several types of experiences. This finding has been supported in some literature (Wing et al., 2015). Greater reports of adversity may be a result of greater time opportunity for exposure among older youth. Furthermore, student researchers expressed that older youth might have greater wisdom to come to terms with accepting experiences than younger youth. Particular experiences, such as substance use, may peak with older age (CDC, 2015).

African American youth experienced significant stressors in this study. This study

supports existing research that youth of color experience a burden of adversity (Schilling et al.,

2007). Student researchers expressed that youth from communities of color experience

situations that youth from other communities do not – they detailed stories about crossing

homicide scenes and receiving phone calls from family members inquiring for their safety; they

felt that situations as these are a norm for them.

Youth substance abuse was positively associated with poor academic performance where

students who self-reported use of drugs also had poorer academic performance. While we could

not establish causality, drug abuse is a well-documented outcome of childhood adversity (;

Hamburger, Leeb, & Swahn, 2008; Hussey, Chang, & Kotch, 2006; Tonmyr, Thornton, Draca, &

Wekerle, 2010). Drug abuse has also been found to result in poor academic outcomes with a

plethora of research demonstrating subsequent impacts on brain development, and poor learning

outcomes (Connell, Gilreath, Aklin, & Brex, 2010; Ellickson, Tucker, & Klein, 2003; Squeglia,

Jacobus, & Tapert, 2009).

While bullying has traditionally been documented to lead to poor academic performance,

(Espinoza et al., 2007; Schwartz, Gorman, Nakamoto, & Toblin, 2005; Strøm, Thoresen,

Wentzel-Larsen, & Dyb, 2013;) we found that students who were being bullied surprisingly had

strong academic performance. The relationship could potentially be that strong academic

performance precedes bullying victimization. Student researchers expressed that they are teased

for investing in their academic aspirations. Researchers have found that Latino and African

American youth (who comprised the majority of our sample) report experiencing stigma from

peers for strong academic affiliation (Tatum, 1997). In a population-based national dataset,

researchers found popularity and academic performance to be inversely linked for Black and

Hispanic youth (Fryer, 2006).

The majority of adversities were not significantly associated with poor academic

performance and we did not find evidence for a relationship between number of adversities and

academic outcomes in our sample. Student researchers proposed that protective factors

associated with the school could be instrumental in the strong performance of students. Examples

of factors cited include: small classroom sizes, school-wide emphasis on social-emotional well-

being, various wellness and culturally diverse activities, dedication to college-attendance,

partnerships with local universities for college access, leadership courses, racial and cultural

identity development, critical consciousness development, and trauma-informed practices such

as healing exercises.

In other settings, a supportive school climate has been shown to increase resilience and

promote academic success. After learning about the impact of ACEs on the developing brain,

staff at Lincoln High School in Walla Walla, Washington (USA) implemented practices to

increase safety, support, compassion, and teamwork. Students who experienced increased

resilience (assessed through supportive relationships, problem solving and optimism) also

experienced an improvement in academic grades despite high ACEs (Longhi, 2015).

Limitations

We were met with challenges such as a small sample size, partly due to difficulty with

recruiting students and obtaining permission from parents (likely given the sensitive nature of the

study) and limited buy-in from high school teachers. The high proportion of 12th grade students

participating in the study is likely explained by student researchers who have rapport with their

senior classmates; on the other hand, we received less interest from 11th graders likely because

11th grade teachers were less willing to allow researchers to recruit from their classrooms, hence providing a study sample that was not reflective of the student body's grade level breakdown. Self-report bias through over report or underreport is possible for youth recalling events from their childhood. Additionally, our data analysis plan did not control for potentially confounding factors through multivariate regression analysis. Finally, due to the cross-sectional nature of the study, we are unable to establish causality between socio-demographic variables, adversity, and academic performance. Results should be generalized with caution, keeping in mind the unique characteristics of the study's sample and setting.

Recommendations

Given the applied nature of CBPR and YPAR, student researchers, H2O Productions staff, and CYW research staff have since translated "research" to "action" through development of educational media to inform community, academic, and medical audiences about the prevalence and harms of childhood adversity. H2O Productions plans to incorporate lessons from the study to reshape high school instructional curricula and address school culture. CYW has incorporated youth feedback into the CYW Adverse Childhood experiences Questionnaire (CYW ACE-Q) screening tool which is now utilized to screen youth for adversity in primary care pediatric models across the country and internationally (Burke Harris & Renschler, 2015).

Future research should continue to explore the complicated interplay of adversity, demographic factors, academic outcomes, as well as resilience factors. The trauma and child health fields require a unique understanding of what adolescents perceive to be stressful compared to young children; because adolescents are more likely to associate with and rely on their peer network than younger children, risk factors, protective factors, consequences, and solutions to address childhood adversity may also be unique. Opportunities to understand and

strengthen adolescent and family relationships must equally be explored. Finally, child-serving providers including school administrators and health care professionals should be cognizant of youth stressors and work together to address the impacts of adversity, as well as promote protective factors that allow youth to thrive, at home and at school.

Conclusion

This research study is the first to our knowledge that utilizes a youth-engagement framework to understand a comprehensive framework of adversity among adolescents. Youth researchers questioned the limited range of childhood adversities and proposed stressors that traditional research on adversity has not encompassed. As a result, we learned of the high prevalence of youth-reported stressors, which may have serious implications on their wellbeing. This project has also been valuable in highlighting the need for partnerships between health organizations and youth who supply their voice and experience to support relevant research and practice.

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Table 1

Characteristics of a sample of urban Northern California youth, (n=92)

Characteristic	Summary statistic [M(SD) or N(%)]
Age	15.91 (1.37)
Grade level	
9th grade	22(24%)
10th grade	22(24%)
11th grade	11(12%)
12th grade	37(40%)
Gender	
Female	49(54%)
Male	42(46%)
Race/ethnicity	
African American	25(27%)
Latino	66(73%)
Academic performance	
Low performance	20(22%)
High performance	71(78%)

Note. M= mean; SD= standard deviation; N=frequency; %=percentage
Race/ethnicity categories represent youth who identified with at least part African American or Latino background
Academic performance categories: Low performance represents mostly C's, D's and F's. High performance represents mostly A's and B's

Table 2

Adversities assessed among a sample of urban Northern California youth, (n=92)

#	Childhood adversity	Survey question
1	Parent separation/divorce	Your parents or guardians were ever separated or divorced.
2	Household member incarceration	You lived with a household member who served time in jail or prison.
3	Household member substance abuse	You lived with anyone who has a problem with drinking or using drugs.
4	Household member mental illness	You lived with someone who was depressed, mentally ill or attempted suicide.
5	Domestic violence	You ever saw or heard household members hurt or threaten to hurt each other.
6	Emotional neglect	You often felt unsupported, unloved and unprotected.
7	Physical neglect	Sometimes you did not have basic needs such as food, clothing, place to live, or access to medical care or had no one to protect you.
8	Emotional abuse	A household member often swore at, insulted, humiliated or put you down in a way that scared you or acted in a way that made you afraid that you might be physically hurt.
9	Sexual abuse	An adult or a peer ever touched your private parts or asked you to touch his/her private parts in a sexual way that was unwanted/against your will/that made you feel uncomfortable.
10	Physical abuse	You were sometimes pushed, grabbed, slapped or had something thrown at OR were ever hit so hard that you had marks or were injured.
11	Foster care	You are or were in foster care.
12	CPS involvement	Your family was involved with Child Protective Services (CPS).
13	Police harassment	You have ever been harassed by a police officer.
14	Peer incarceration	You have a friend or peer who has been locked up, arrested or incarcerated.
15	Youth incarceration	You have ever been locked up, arrested or incarcerated.
16	Peer substance abuse	You have a friend or peer who uses drugs or alcohol consistently.
17	Youth substance abuse	You use drugs or alcohol consistently.
18	Parent/guardian death	You lived with a parent or guardian who died.
19	Family member death	One of your family members died.
20	Peer death	One of your close friends or peer died.
21	Peer mental illness	You have a friend or peer who is depressed, has ever hurt themselves, or tried to commit suicide.
22	Serious medical	You ever had a serious medical procedure or life

	procedure/illness	threatening illness.
23	Bullying victimization	You often experienced harassment or bullying at school.
24	Negative school climate	You often feel silenced, fearful or anxious at school.
25	Community violence	You have often seen or heard violence in your neighborhood or your school neighborhood.
26	School violence	You have often seen or heard violence in your school.
27	Discrimination	You were often treated badly because of race, sexual orientation, place of birth, or disability.

Note. Items 1-10 were derived from the original ACE study (Felitti et al, 1998). Items 11-27 were derived from collaboration between youth researchers and CYW staff, and adversity literature

Figure 1

Prevalence of adversities reported by a sample of urban Northern California youth, (n=92)
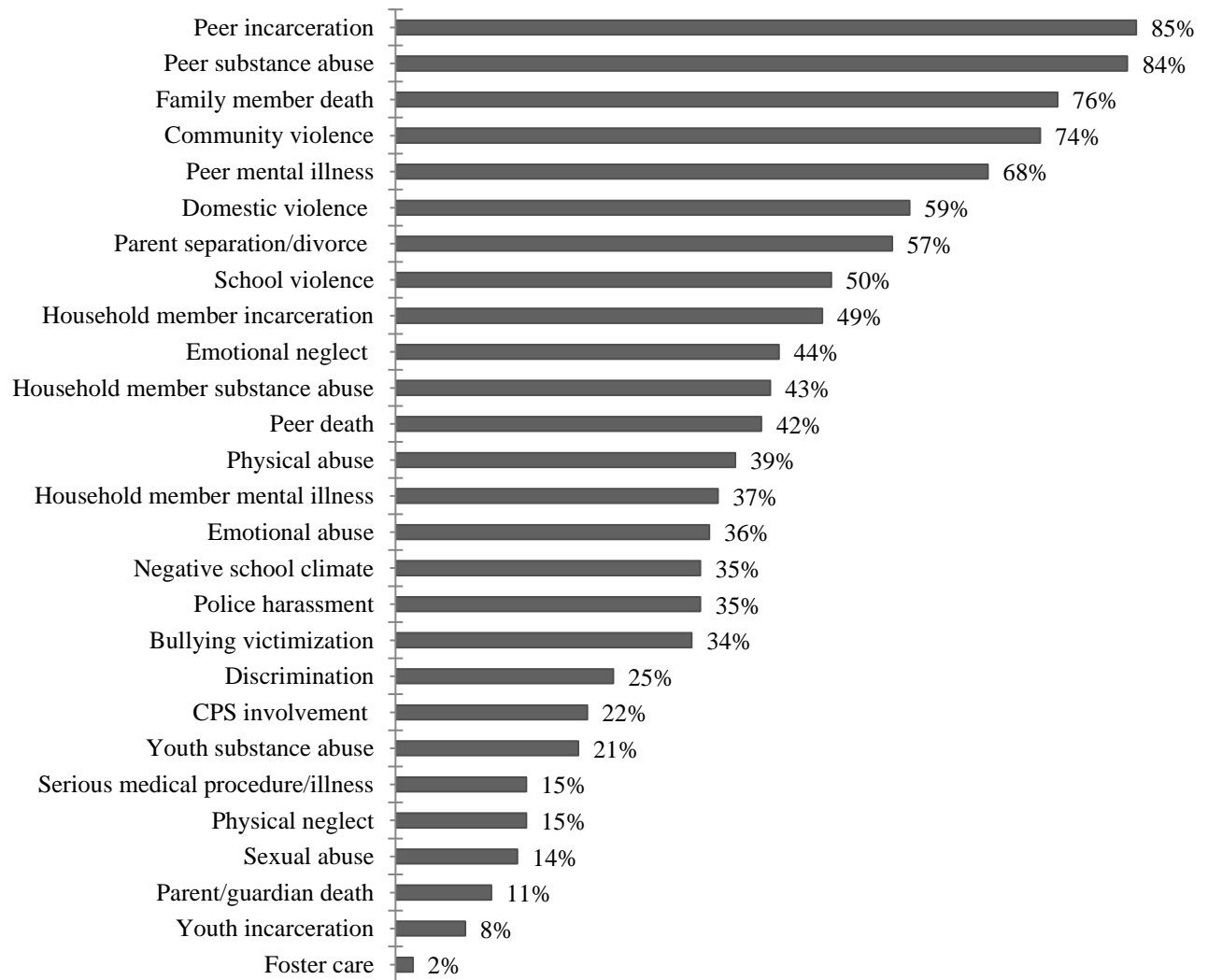
Note. Figure 1 depicts the prevalence of 27 various childhood adversities in order by increasing prevalence. Percentage (%) indicates prevalence of each adversity

Table 3

Comparison of prevalence of adversities to original adult and recent youth data

	CDC and Kaiser Permanente ACE study, 1998	Northern California urban High School, 2015-2016	National Survey on Children's Health, 2011-2012
Sample characteristics	(n=17,337) Age 19+ >70% White	(n=92) Age 15-18 >90% African American, Latino	(n=34,601) Age 12-17 36% Black, 30% Hispanic, 37% White
Data collection method	Self-report, paper-based survey distributed by mail	Self-report, computer-based survey	Parent-report, survey administered over telephone
0 ACEs	36%	8%	(Not all original ACEs assessed)
1 ACE	26%	13%	(Not all original ACEs assessed)
2 ACEs	16%	17%	(Not all original ACEs assessed)
3 ACEs	10%	11%	(Not all original ACEs assessed)
4+ ACEs	13%	51%	(Not all original ACEs assessed)
Parent divorce/separation	23%	57%	28%
Household member substance abuse	27%	43%	15%
Household member mental illness	19%	37%	12%
Household member incarceration	5%	49%	8%
Witness to domestic violence	13%	59%	10%
Emotional abuse	11%	36%	Not assessed
Physical abuse	28%	39%	Not assessed
Sexual abuse	21%	14%	Not assessed
Physical neglect	10%	15%	Not assessed
Emotional neglect	15%	44%	Not assessed
Parent/guardian death	Not assessed	11%	5%
Witnessed neighborhood violence	Not assessed	74%	14%

Note. ACE=Adverse Childhood Experience; n=sample size; %=percentage or prevalence
CDC and Kaiser Permanente ACE Study findings from CDC (2016) ACE Study website
National Survey on Children's Health findings from Sacks, Murphey, & Moore (2014)

Table 4

Distribution of Adverse Childhood Experiences (ACEs) according to socio-demographics and academic performance

	ACE Score 1-10	Parent separation/divorce		Household member incarceration		Household member substance abuse		Household member mental illness		Domestic violence		Emotional neglect		Physical neglect		Emotional abuse		Sexual abuse		Physical abuse	
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Age	r=0.24*	16.1 (1.4)	15.6 (1.3)	16.3 (1.4)*	15.6 (1.3)	16.2 (1.3)	15.8 (1.4)	16.3 (1.4)	15.7 (1.3)	16.0 (1.4)	15.7 (1.3)	15.9 (1.4)	15.9 (1.3)	16.8 (1)**	15.7 (1.4)	15.8 (1.3)	16 (1.4)	16.12 (1.1)	15.9 (1.4)	16.3 (1.3)	15.7 (1.4)
Gender																					
F	4.5 (2.6)*	60	40	49	51	48	52	45	55	65	35	57*	43	13	88	51**	49	24**	76	41	59
M	3.2 (2.5)	52	48	48	53	39	61	29	71	50	50	30	70	19	81	19	81	2	98	38	62
Race/ethnicity																					
AA	4.3 (2.2)	52	48	75**	25	40	60	44	56	76*	24	48	52	12	88	32	68	12	88	44	56
Not AA	3.8 (2.7)	59	41	39	61	45	55	34	66	52	48	43	57	17	83	37	63	15	85	37	63
Latino	4.1 (2.8)	57	43	51	49	50	50	38	62	58	42	47	53	18	82	42*	58	15	85	39	62
Not Latino	3.4 (1.8)	56	44	46	54	28	72	36	64	64	36	39	61	8	92	20	80	12	88	40	60
Academic performance																					
Low	4.3 (2.5)	45	55	45	55	50	50	55	45	60	40	55	45	16	84	35	65	25	75	45	55
High	3.8 (2.8)	60	40	51	49	42	58	32	68	59	41	42	58	15	85	37	63	11	89	38	62

Note. *= p<0.05; **=p<0.01, r=correlation coefficient, AA= African American. Age to adversity score comparison presented with Pearson correlation coefficient using Pearson correlation, a test for correlation. Age to specific adversity comparisons comparison presented as mean (standard deviation) from t-test. Gender, race/ethnicity, academic performance to adversity score comparisons presented as mean (standard deviation) from t-test. Gender, race/ethnicity, academic performance to specific adversity comparisons are in percentages (%) from chi square test.

Table 5A

Distribution of youth-proposed childhood adversities according to socio-demographics and academic performance

	Adversity score, 1-27	Foster care		CPS involvement		Police harassment		Peer incarceration		Youth incarceration		Peer substance abuse		Youth substance abuse		Parent/ guardian death	
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Age	r=0.32**	14 (0)	16 (1.4)	15 (1.6)	15.9 (1.3)	16.4 (1.4)*	15.7 (1.3)	16.1 (1.3)**	14.6 (1.4)	17.1 (0.7)*	15.8 (1.4)	16.1 (1.3)*	15.2 (1.5)	16.7 (0.9)**	15.7 (1.4)	16.3 (1.4)	15.9 (1.4)
Gender																	
F	11.3 (4.6)	4	96	27	73	21	79	86	14	2	98	82	18	23	77	6	94
M	10 (4.9)	0	100	18	83	52**	48	83	17	15*	85	85	14	20	80	17	83
Race/ethnicity																	
AA	11.9 (4.4)	8	92	46**	54	56*	44	84	16	12	88	72	28	13	88	28**	72
Not AA	10.2 (4.7)	0	100	14	86	27	73	85	15	6	94	88	12	25	75	4	96
Latino	11 (4.9)	2	98	22	78	35	65	85	15	9	91	85	15	27	73	8	92
Not Latino	10.2 (3.8)	4	96	21	79	36	64	84	16	4	96	84	16	8	92	20	80
Academic performance																	
Low	11.3 (5)	0	100	21	79	47	53	90	10	16	84	95	5	44**	56	20	80
High	10.6 (4.5)	3	97	23	77	32	68	83	17	6	94	80	20	16	84	8	92

Note. *= p<0.05; **=p<0.01, r=correlation coefficient, AA= African American. Age to adversity score comparison presented with Pearson correlation coefficient using Pearson correlation, a test for correlation. Age to specific adversity comparisons comparison presented as mean (standard deviation) from t-test. Gender, race/ethnicity, academic performance to adversity score comparisons presented as mean (standard deviation) from t-test. Gender, race/ethnicity, academic performance to specific adversity comparisons are in percentages (%) from chi square test.

Table 5B

Distribution of youth-proposed childhood adversities according to socio-demographics and academic performance (Continued)

	Family member death		Peer death		Peer mental illness		Serious medical procedure/ illness		Bullying victimization		Negative school climate		Community violence		School violence		Discrimination	
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Age	16 (1.4)	15.7 (1.4)	16 (1.4)	15.9(1.4)	16 (1.5)	16 (1.2)	16.1(1.7)	15.9(1.3)	15.8 (1.3)	16 (1.4)	16 (1.2)	15.9 (1.4)	16.1 (1.3) **	152 (1.5)	16.3 (1.2)**	15.5 (1.4)	16.1 (1.1)	15.8 (1.5)
Gender																		
F	77	23	32	68	73	27	17	83	44*	56	43	57	72	28	49	51	31	69
M	76	24	54*	46	64	36	12	88	24	76	24	76	76	24	50	50	20	80
Race/ethnicity																		
AA	84	16	52	48	64	36	8	92	33	67	32	68	80	20	60	40	36	64
Not AA	73	27	38	63	70	30	17	83	34	66	36	64	72	28	46	54	64	36
Latino	78	22	41	59	70	30	19	81	36	64	36	64	77	23	45	55	22	78
Not Latino	68	32	44	56	68	32	4	96	29	71	32	68	72	28	64	36	36	64
Academic performance																		
Low	89	11	56	44	55	45	6	94	15	85	25	75	72	28	45	55	30	70
High	73	27	39	61	73	27	17	83	40*	60	38	62	76	24	52	48	24	76

Note. *= p<0.05; **=p<0.01, r=correlation coefficient, AA= African American. Age to adversity score comparison presented with Pearson correlation coefficient using Pearson correlation, a test for correlation. Age to specific adversity comparisons comparison presented as mean (standard deviation) from t-test. Gender, race/ethnicity, academic performance to adversity score comparisons presented as mean (standard deviation) from t-test. Gender, race/ethnicity, academic performance to specific adversity comparisons are in percentages (%) from chi square test.