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Adverse Childhood Experiences (ACEs) and depressive symptoms in an urban community college population

Niekorzystne doświadczenia z dzieciństwa a objawy depresyjne
wśród miejskiej populacji studenckiej


ABSTRACT


Adverse Childhood Experiences (ACEs), including family dysfunction, abuse, neglect, and community-instigated stress (Urban ACEs), are linked to negative health outcomes. This study examined self-reported trauma and depressive symptoms among urban community college students in the USA, using a descriptive correlational design with a convenience sample. Trauma was assessed through both conventional ACEs and Urban ACEs, and depressive symptoms were measured using the PHQ-9. Results indicated significant trauma (ACE $\mu = 3.59$, Urban ACE $\mu = 2.15$) and depressive symptoms (PHQ-9 $\mu = 9.30$). Demographic analysis showed that students identifying as gender “other” and those of Hispanic ethnicity exhibited heightened vulnerability to trauma. The addition of childhood trauma to the inherent challenges faced by urban community college students creates an excess burden. Therefore, assessment of childhood trauma and the provision of psychosocial resources are critical to promoting the success and well-being of these students.


Keywords: Adverse Childhood Experiences (ACEs), trauma, community college students, depressive symptoms


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STRESZCZENIE

Niekorzystne doświadczenia z dzieciństwa (ACEs) – takie jak dysfunkcyjność rodziny, przemoc, zaniedbywanie, czy też stres środowiskowy (Urban ACEs) – są łączone z negatywnymi skutkami zdrowotnymi. W poniższym badaniu przeanalizowane zostały samodzielnie zadeklarowane traumy oraz objawy depresyjne wśród populacji miejskiej studentów szkół półwyższych w Stanach Zjednoczonych; używając przy tym opisowej metody korelacyjnej z próbą uznaniową. Trauma została oszacowana na podstawie zarówno ACEs, jak i Urban ACEs, podczas gdy objawy depresyjne zostały ocenione przy użyciu kwestionariusza PHQ-9. Wyniki wskazują na obecność znacznej traumy (ACEs $\mu = 3,59$, Urban ACEs $\mu = 2,15$) oraz objawów depresyjnych (PHQ-9 $\mu = 9,30$). Analiza demograficzna wykazała, że studenci opisujący swoją płć jako „inną” oraz studenci o latinoamerykańskiej tożsamości etnicznej wykazywali zwiększoną podatność na traumę. Występowanie traumy dziecięcej w połączeniu z wyzwaniem nieodzownymi dla miejskiej populacji studentów szkół półwyższych powodują powstanie nadmiernego ciężaru psychicznego. Dlatego też ewaluacja traumy dziecięcej oraz zapewnienie pomocy psychosocjalnej są nieodzowne dla poprawy dobrostanu oraz osiągnięć akademickich owych studentów.

Słowa kluczowe: niekorzystne doświadczenia z dzieciństwa (ACEs), trauma, studenci szkoły półwyższej, objawy depresyjne

BACKGROUND

The evolution of childhood trauma as a precursor to long-term health consequences was first demonstrated in the landmark Kaiser Permanente study (Felitti *et al.*, 1998) and continues to prompt interest in understanding how trauma impacts physiological and psychological outcomes. The original Adverse Childhood Experiences (ACE) study conducted in the Kaiser Permanente Health System in California, United States of America (USA) looked at participants' self-reported exposure to childhood trauma in the categories of abuse, neglect and family dysfunction (Felitti *et al.*, 1998). The study involved over 17,000 adult participants who were receiving their healthcare from the Kaiser Permanente system in the USA, from 1995–1997. Felitti *et al.* (1998) found that over 67% of participants reported at least one type of experienced childhood trauma and 20% reported three or more ACEs (Felitti *et al.*, 1998). The study found a strong correlation between the amount of childhood trauma and negative health outcomes (Felitti *et al.*, 1998). Childhood trauma increased the risk of depression, anxiety and substance use as well as increasing risk for chronic disease such as heart disease and diabetes (Felitti *et al.*, 1998). This innovative work sparked a large body of research illustrating a graded relationship between

ACEs and poor health outcomes (Hughes *et al.*, 2017; Petrucci *et al.*, 2019). Predicated on the assessments of ACEs established by the Kaiser study, subsequent research was aimed primarily at focusing inquiry to specific populations and disorders, repeatedly reaffirming in their context the findings from the original study. In reflecting on the pivotal research, McEwen and Gregerson (2019) recognized the critical limitations of the original ACEs study as it pertained to the homogeneity of the study group. The need to consider the impact of ACEs within the framework of the social determinants of health was raised as a vital next step in considering primary prevention interventions (McEwen, Gregerson, 2019). The negative impact of ACEs on social determinants of health such as high school completion, unemployment, and poverty was illustrated by Metzler *et al.* (2017) and offered a broader understanding of the detrimental sequelae of childhood trauma. Looking more closely at the college-age population, research has found correlations between ACEs and substance use (Brett *et al.*, 2018; Brumley *et al.*, 2017; Forster *et al.*, 2018; Wolitzky-Taylor *et al.*, 2017). In addition to substance abuse in college-age adults as a consequence of ACEs, Windle *et al.* (2018) found a significant association between greater adversity and increased body mass index (BMI), and higher levels of depressive symptoms in a college

population. A predictive outcome of ACEs included the progressive decline of mental health (Karatekin, 2018).

McEwen and Gregerson (2019) reasoned that advancements in understanding the neuroscience of trauma have been beneficial in contemplating policies for intervention. Jaworska-Andryszewska and Rybakowski (2019) dissected the harmful impact of childhood trauma on the neurobiological pathways specifically regarding the development of mood disorders. The complex epigenetic basis for the development of depressive disorder and bipolar disorder further highlights childhood trauma as a significant risk understood from a more contemporary viewpoint regarding neurobiology than was available at the time of the original study (Jaworska-Andryszewska, Rybakowski, 2019). The enhanced comprehension of the neurobiology of childhood trauma extends to the possibility of trauma being a barrier to treatment interventions including a pharmacological response (Jaworska-Andryszewska, Rybakowski, 2019).

McEwen and Gregerson (2019) recognized an expansion of assessing childhood trauma within the context of other populations, and a recognition that the type of trauma may vary among these populations. For example, traumatic childhood experiences within the urban environment may manifest outside of the realms of conventional childhood trauma included in the original ACEs study. In 2012 the Institute for Safe Families (ISF), in collaboration with the Philadelphia, PA., USA, ACE Task Force conducted a study of trauma more prevalent in racial and socio-economically diverse environments and included witnessing violence, experiencing racism, being bullied, living in an unsafe neighborhood, and living in foster care (Merritt *et al.*, 2013). These urban ACE indicators of trauma were found to be consistently related to poor health outcomes and correlated with substance use and sexually transmitted infections (Merritt *et al.*, 2013; Wade *et al.*, 2016).

Community colleges provide educational and career opportunities that can lead to higher wages. However, students often face barriers such as being first-generation college students, coming from lower socio-economic backgrounds, and

having responsibilities beyond themselves, all of which can hinder academic progress (American Association of Community Colleges [AACCC], 2013). Urban community college students are also more likely to belong to minority racial or ethnic groups (AACCC, 2013). Mental health concerns are prevalent among community college students, with Eisenberg *et al.* (2013) finding that 49% of 4,000 students surveyed across 10 community colleges reported at least one mental health condition. Additionally, Anders *et al.* (2012) noted that life experiences of potentially traumatic events were linked to negative academic outcomes in these students.

The recognition of ACEs as a public health crisis has prompted a more aggressive response to understanding the role trauma plays within the context of the social determinants of health. Waite and Ryan (2019) recognized the importance of deterring adversity by bolstering resilience and promoting healing in communities burdened by ACEs. While the literature supports the findings in the initial study (Felitti *et al.*, 1998), demonstrating the increase of health risk associated with childhood trauma, it fails to dissect the specific implications of ACEs in the population of urban community college students.

PURPOSE

A gap existed in the literature in understanding childhood trauma and depressive symptoms in urban community college students. Understanding trauma in a population is essential to addressing its sequela. This study's purpose was to better understand childhood trauma and depressive symptoms within a population of students attending an urban community college.

METHOD

After receiving institutional review board approval, the study was conducted at an urban community college in the USA. Students received an email with a link to the survey from the Office of Institutional Research at the college, offering voluntary participation in a study about childhood trauma. This study occurred during the worldwide COVID-19 pandemic when all learning

was done virtually. The survey consisted of 30 questions categorized as follows: (1) demographic information; age, gender identification, race, and ethnicity (2) ACE instrument; 10 questions (3) Urban ACE indicators; 6 questions (4) PHQ-9; 27 questions. The minimum ACE instrument score is 0 and the maximum score is 10. The minimum Urban ACE indicator score is 0 and the maximum score is 6. The larger the number reported on each of the instruments measuring trauma correlates with a greater degree of trauma reported. The PHQ-9 instrument measuring depressive symptoms has a minimum score of 0 and a maximum score of 27. A higher score correlates with an increase in depressive symptoms. The degree of functioning related to reported depressive symptoms is reported on a scale of 1 (not difficult at all) to 4 (extremely difficult). A qualitative question was asked at the end of the survey asking participants if they had anything else they wanted to say about experiences with trauma. This question was analyzed separately and not included in the reporting of the quantitative data.

RESULTS

Description of sample

The age range of respondents was from 18 to 68 years of age, with a mean age of 29.5 years ($N = 281$). Gender identification included 233 (83%) females, 41 (14.5%) males, and 7 (2.5%) respondents who identified as *other*.

Race identification for respondents ($N = 267$) included 111 (41.5%) who identified as white, 105 (39%) as black; 21 (7.8%) as Asian; and 30 (11%) who identified as 2 or more races. Those identifying two or more races included Pacific Islanders (2) and American Indian or Alaska Native (4).

Ethnicity identification of the respondents ($N = 291$) included 240 (82.5%) who identified as non-Hispanic and 51 (17.5%) respondents who identified as Hispanic. The demographic characteristics of the study mirrored that of the college, except for gender distribution where there was an overwhelming response from those identifying as female, and there was no data from the college on students who identified as gender other than binary male/female.

A power analysis was conducted using g power and determined that sample size of 281 resulted in a power of .999. Variations in sample sizes were due to variations in respondents answering questions in the questionnaire.

Research Question 1 – What is ACE the score, urban ACE score and PHQ-9 score of the population of an urban community college?

Descriptive statistics were used to analyze the mean ACE score, Urban Ace score and PHQ-9 score of the population surveyed. The possible range in scores for the ACE questionnaire was 0-10 and respondents reported within the full range of scores.

The urban ACE indicators questions provided data on traumatic experiences more likely seen in an urban community and included stressors not assessed in the original ACE study. The range of scores for the Urban ACE questionnaire was 0-6 and respondents to the questionnaire reported scores of 0-5, with no respondents reporting the maximum score of 6.

The PHQ-9 is a measurement of depressive symptoms. Scores for the level of depressive symptoms of the PHQ-9 are as follows: 1-4 minimal, 5-9 mild, 10-14 moderate, 15-19 moderately severe and 20-27 severe. The minimum possible score for the PHQ-9 is 0 and maximum 27 and respondents to the survey reported scores within the full range of 0-27.

The PHQ-9 functioning item asks respondents to rate the degree of difficulty in executing their daily activities. The scores ranged from 1 (no difficulty) to 4 (extremely difficult). Respondents reported scores within the full range of 1 to 4.

Research question 2 – What is the relationship between demographic characteristics, ACE score, urban ACE Score, PHQ-9 of an urban community college population?

A one-way ANOVA was used to analyze the mean differences between the three surveys (ACE, Urban ACE and PHQ-9) as the dependent variable and each demographic (race, ethnicity and gender identification). Table 2 illustrates

Adverse Childhood Experiences (ACEs) and depressive symptoms in an urban community college population

Table 1. Descriptive statistics of ACE score, Urban ACE score and PHQ-9

	N	Actual Range	Mean Score (SD)	Median Score
ACE Score	292	0–10	3.59 (2.56)	4
Urban ACE Score	292	0–5	2.15 (1.40)	2
PHQ-9	293	0–27	9.30 (6.82)	4
function related to PHQ-9 score	278	1–4	2.02 (.910)	2

Source: own study based on research.

Table 2. Race ethnicity, and gender identification and ACE score, Urban ACE score, PHQ-9 score

Race	N	μ ACE score (SD)	μ Urban ACE score (SD)	μ PHQ-9 score (SD)
Black	105	3.67 (2.66)	2.32 (1.44)	8.66 (6.19)
White	111	3.50 (2.52)	1.89 (1.28)	10.68 (6.74)
Asian	21	2.26 (2.53)	2.42 (1.46)	8.47 (5.93)
2/more races	30	4.67 (1.99)	2.53 (1.57)	11.8 (7.94)
Total	267	3.61 (2.56)	2.17 (1.40)	9.85 (6.69)
Ethnicity				
Hispanic	51	3.98 (2.14)	2.69 (1.41)	11.94 (7.52)
Non-Hispanic	240	3.50 (2.64)	2.04 (1.38)	8.71 (6.54)
Total	291	3.59 (2.56)	2.15 (1.40)	9.30 (6.80)
Gender Identification				
Male	41	3.15 (2.55)	2.22 (1.11)	9.21 (7.42)
Female	233	3.65 (2.58)	2.12 (1.44)	9.07 (6.57)
Other	7	4.14 (1.86)	3.00 (1.41)	17.71 (6.85)
Total	281	3.60 (2.56)	2.16 (1.40)	9.30 (6.80)

Source: own study based on research.

the descriptive statistics of race, ethnicity and ACE score, Urban ACE score, PHQ-9 score.

Research question 3 – What is the relationship between demographic characteristics, ACE score and PHQ-9; Urban ACE score and PHQ-9 score of an urban community college population?

A Pearson correlation was used to analyze the relationship between age and ACE scores, Urban ACE scores and PHQ-9 depressive symptoms scores (N = 281). Pearson's product correlation analyses demonstrated a direct correlation between the PHQ-9 and the urban ACE questionnaire ($r = .35$; $p < .001$), the PHQ-9

and ACE questionnaire ($r = .36$; $p < .001$), and an inverse correlation between the PHQ-9 and age ($r = -.31$; $p < .001$). Older age was significantly correlated with a lower urban ACE score and lower depressive symptoms marked by the PHQ-9 score.

A one-way ANOVA was analyzed to determine if gender had a significant effect on ACE score, Urban ACE score and PHQ-9 score depressive symptoms. Gender had a significant effect on PHQ-9 score, $F(2,288) = 5.66$, $p = .004$. Post hoc analysis Bonferroni's comparisons showed that gender "other" was significantly different than male ($p = .006$) and female ($p = .003$). Male v. female was not significantly different ($p > .05$).

A one-way ANOVA was analyzed to determine if race had a significant effect on ACE score, Urban ACE score and PHQ-9 score depressive symptoms. Race had a significant effect on PHQ-9 score ($F(3,261) = 2.87$, $p = .037$); Urban ACE score ($F(3,260) = 2.91$, $p = .04$) and ACE score ($F(3,260) = 3.66$, $p = .013$). Post hoc comparisons using Bonferroni's and Tamhane's showed that no pair wise comparisons were significantly different except Black race ($M = 2.33$, $SD = 1.44$) v. two or more races ($M = 2.53$, $SD = 1.57$) Urban ACE score ($p = .008$).

An Independent sample t test was conducted, comparing means for ACE score, Urban ACE score and PHQ-9 score across two independent sample ethnicity groups, Hispanic and non-Hispanic. Ethnicity has a significant effect on PHQ-9 score ($t(289) = -3.10$, $p = .002$) and Urban ACE score ($t(288) = -3.01$, $p = .003$). Ethnicity Hispanic PHQ-9 score ($M = 11.94$, $SD = 7.52$) was higher than non-Hispanic ($M = 8.74$, $SD = 6.53$).

DISCUSSION

The implications of this study are best understood by first recognizing the significance of trauma experienced by participants in the study. The mean ACE score of participants (3.59) and Urban ACE score (2.15) of the population suggested a range of trauma experienced by the population. The original ACE study (Felitti *et al.*, 1998) supported a strong graded relationship

between childhood trauma and adult onset of chronic disease, mental illness, substance use disorder and overall life potential such as graduation rates, academic achievement, and work performance (Felitti *et al.*, 1998). An ACE score of 1–3 implies intermediate risk without already established health conditions, high risk with associated health conditions (ACES Aware, 2020). The urban ACE indicators measure a more external exposure to trauma, and outcomes indicated a graded relationship between this type of trauma and the existence of sexually transmitted infections and substance use disorder (Wade *et al.*, 2016).

The absence of a finding supporting any statistical significance in age, ethnicity, race or gender is consistent with the notion that ACEs impact people across all demographic characteristics. The demographics of participants in this study were much more diverse and could be considered more vulnerable than the original ACE study where participants were primarily white, college-educated and had health insurance. While the data cautions of the vulnerability of the population surveyed, the average age of the students studied (29.5 years) is considerably younger than the cohort in the original ACE study (57 years) and could allow for more opportunity to mitigate poor health outcomes with proactive interventions.

The measurement of depressive symptoms (PHQ-9 score mean 9.30) was informative of the population surveyed and revealed a population that bordered on moderate depressive symptoms. These signs typically could include difficulty with interest, energy, concentration, appetite and sleep (American Psychiatric Association, 2013) and represent essential functions required for academic success.

Focusing on demographic trends in trauma (ACE and Urban ACE) and depressive symptoms, participants identifying as gender "other" had higher scores across all three measures, highlighting their increased vulnerability. Research has shown that young adults identifying as other than cisgender are at heightened risk for mental illness, substance use disorders, and victimization (Newcomb, 2020; Rimes, 2019). Although the number of participants identifying

as “other” was small ($N = 7$), these findings underscore the need for further investigation into this population. Hispanic participants showed significant depressive symptoms on the PHQ-9 and higher exposure to urban trauma, marked by the Urban ACE score. The risk of suicidality in Hispanic youth, especially when compounded by depression and isolation, underscores the importance of targeted interventions (Chang *et al.*, 2019).

Key findings of this study confirmed that childhood trauma was present across racial and ethnic groups, supporting the original ACE study’s conclusions (Fellitti *et al.*, 1998). Unlike the original ACE study, this research identified a significant relationship between gender “other” and higher scores on all three measures (ACEs, Urban ACE, and PHQ-9). The small sample size ($N = 7$) limits the generalizability of these findings. However, the presence of Urban ACE trauma aligns with the characteristics of the urban college population studied. Additionally, the mean PHQ-9 score of 9.30, indicating moderate depressive symptoms, reflects the high prevalence of mental health conditions reported in community college populations (Eisenberg *et al.*, 2013).

IMPLICATIONS FOR PRACTICE

As healthcare moves to an approach that embraces harm reduction, this research supports an argument for educating both faculty and students about the implications of exposure to childhood trauma. The intrinsic risk to this population of students paired with the significance of both self-reported trauma and depressive symptoms, supports more screening and supportive measures to mitigate negative outcomes. Academic success is linked to more job and financial opportunities. Addressing the challenges presented by trauma and depressive symptoms may help to expedite academic and career goals.

Refining the population to include groups most at risk, such as those identifying as gender *other*, and offering targeted efforts should be considered. The impact of this support should be measured against academic progression and career goal achievement.

LIMITATIONS

This study relied on a convenience sample of students and a self-report of experiences with childhood trauma and depressive symptoms. Trauma is inherently a subjective perception, and self-report is the standard. Concurrently, subjective responses to questions related to depressive symptoms and associated functioning related to these symptoms is the standard assessment of mood.

Students completed questionnaires during a global pandemic. While the pandemic itself wasn’t a limitation, remote learning, housing, and financial disruptions were considered. It’s unclear how these changes influenced survey responses. A key limitation of this research is that it was conducted at a single institution, so while there may be similarities with other urban community colleges, the findings are not generalizable to other college populations.

The study had diverse racial and ethnic participants but was imbalanced in gender identification. More participants were female, with fewer males and only seven identifying as “gender other.” Although trauma and depressive symptoms were consistent for “gender other” participants, the small sample size limits generalizability.

FUTURE RECOMMENDATION RESEARCH

This study’s findings contribute to the extant research confirming the existence of a population with a history of trauma; both trauma from within the family system (ACE) and from the external environment (Urban ACE). This finding paired with a PHQ-9 score signifying moderately severe depressive symptoms, highlights a population who has inherent risk of success at baseline to be in further jeopardy in the academic environment. The findings suggest the need for a trauma-informed approach to supporting urban community college students for success.

It is crucial to raise awareness of childhood trauma’s effects and help students proactively address them. Future research should focus on educating individuals about trauma’s long-term impact, assessing interventions for residual symptoms, and examining how trauma affects gender-diverse populations.

CONCLUSION

Although the original ACE study is over 20 years old, the results of the study continue to be relevant and offer the basis to understand how early trauma has long lasting effects. As the elements of trauma become more understood, the focus needs to shift to better understanding populations impacted by childhood trauma and developing interventions to address trauma. This study both confirmed the existence of trauma and depressive symptoms in a population of community college students and prompted more questions about the impact on gender demographics and how to address the trauma to best facilitate academic outcome.

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