How do Differences in Adolescent and Caregiver Reports of Adolescent Adverse Childhood Experiences Relate to Adolescent Depression?

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Objective To compare adolescent and caregiver reports of adolescent adverse childhood experiences (ACEs) and their relationship with current adolescent depression and to analyze the relationship between ACEs and depression.

Methods We recruited 46 adolescent–caregiver dyads from a large, inner-city medical center's adolescent medicine clinic. Adolescents and caregivers completed the Center for Youth Wellness ACE questionnaire, encompassing traditional ACEs (eg, abuse, neglect, household dysfunction) and nontraditional ACEs (eg, foster care, parental death, exposure to community violence). Adolescents also completed the Patient Health Questionnaire-9A (PHQ-9A) depression screening tool.

Results Among adolescents, 14 (30%) reported no traditional ACEs, 11 (24%) reported 1, and 21 (46%) reported more than 1. Regarding nontraditional ACEs, 16 (35%) reported none, 11 (24%) reported 1, and 19 (41%) reported more than 1. Caregiver reports consistently indicated lower ACEs compared with adolescent self-reports ($P < .005$). For the PHQ-9A scores, 26 (57%) of adolescents showed no or minimal depression, 14 (30%) mild, and 6 (13%) moderate depression. A moderate positive correlation emerged between PHQ-9A scores and self-reported traditional ACEs ($r_s = 0.5$, $P < .001$) and nontraditional ACEs ($r_s = 0.49$, $P < .001$). In addition, a positive correlation was observed between the absolute differences in adolescent and caregiver reports of traditional ACEs and PHQ-9A scores ($n = 46$, $\rho = 0.51$, $P < .001$).

Conclusions As the differences in ACE reports between adolescents and caregivers increased, there was a corresponding increase in adolescent depression scores. It is essential to incorporate comprehensive ACE screening and encourage open communication between adolescents and caregivers, which may improve mental health outcomes. *(J Pediatr 2024;13:200113)*.

Adverse childhood experiences (ACEs) are defined as potentially traumatic events that occur before the age of 18 years.[1-3] The 3 types of "traditional ACEs" are abuse (physical, emotional, sexual), neglect (physical, emotional), and household dysfunction (mental illness, mother treated violently, divorce, incarcerated relative, and substance abuse).[1-3] Witnessing or experiencing an event can pose a real or perceived loss, threat, or harm to a person's physical and/or emotional well-being.[1-8] The Center for Youth Wellness (CYW) ACE questionnaire also includes 9 additional early life stressors, which we will refer to as "nontraditional ACEs," that are also considered traumatic events: foster care; bullying; parental death; separation of the parent via deportation or migration; medical trauma; exposure to community violence; discrimination; personal incarceration; and personal domestic violence.[9-13] These additional early-life stressors encompass experiences of individuals living in diverse inner-city environments that were not captured in the original ACE questions.[9,10,13]

Over the past decade, rates of depression have increased in the adolescent population.[14-17] There is research to support the positive correlation between ACEs and depression in adolescents.[18-24] However, there is limited research comparing the relationship between adolescent and caregiver reports of adolescent ACEs and how this comparison relates to adolescent depression. Research has shown that caregivers and adolescents may have different reports on adolescent ACEs. For example, some studies have found that caregivers tend to under-report adolescent ACEs compared with adolescents.[25,26] One of the reasons is fear of consequences, denial, or lack of awareness of their adolescents' experiences.[26] Alternatively, adolescents may be more willing to report their experiences for validation or support.[26] Understanding the differences between caregiver and adolescent reports of adolescent ACEs is important because it can have implications for the assessment and treatment of ACEs. The degree of difference between caregiver and adolescent reports can offer valuable insights into family dynamics and communication patterns. Discrepancies in reporting may signal issues in family relationships or the adolescent's willingness to disclose sensitive information.

ACE	Adverse childhood experience
CYW	Center for Youth Wellness
PHQ-9A	Patient Health Questionnaire-9A

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Recognizing these dynamics can guide therapists and caregivers in fostering more open and supportive communication channels, which, in turn, may improve mental health outcomes.

The purpose of this study was to compare adolescent and caregiver reports of adolescent ACEs and their relationship with current adolescent depression and to analyze the relationship between ACEs and depression. We hypothesized that exposure to a greater number of ACEs would be positively correlated with depression in adolescents. We also hypothesized that there would be agreement between caregiver and adolescent reports of adolescent ACEs, both traditional and nontraditional.

Methods

Setting and Participants

Participants were approached in the adolescent medicine clinic of a large, inner-city medical center. Adolescents 12-21 years of age and their caregivers were eligible to participate if they spoke English or Spanish. Adolescents and caregivers who did not speak either English or Spanish, adolescents scheduled for sick/follow-up visits, adolescents and caregivers with significant cognitive impairment, and/or adolescents not accompanied by their caregivers were excluded from the study. The study was approved by the institutional review board of Weill Cornell Medical College, and all participants provided written informed consent or assent.

Procedures

Adolescents and their caregivers independently completed the 19-item ACE questionnaires from the CYW (CYW ACE-Q Teen SR [self-report] and CYW ACE-Q Teen, respectively).[9,10] The caregiver report was completed on the basis of their understanding of their adolescent's ACEs. Scoring is divided into 2 sections: Section One measures exposure to 10 traditional ACEs, 3 Abuse, 2 Neglect, and 5 Household Dysfunction. Section Two measures exposure to 9 nontraditional ACEs that are considered additional early life stressors of youth including Foster Care, Death of a Parent, Deportation, Bullying, and others.[9,10] Of note, the CYW ACE-Q Teen SR (self-report) and CYW ACE-Q Teen questionnaires are not recognized as validated screening tools. Adolescents also completed the Patient Health Questionnaire-9A (PHQ-9A), a validated depression screening tool, which was scored from 0 to 27.[27] A score of 0-4 indicates no or minimal depression, 5-9 mild depression, 10-14 moderate depression, 15-19 moderately severe depression, and 20-27 severe depression.[27] The CYW ACE questionnaires were distributed by the research team after obtaining consent/assent. The PHQ-9A screen was distributed by the primary care team as part of routine screening. The patient's demographic information including race and ethnicity was retrieved from the patient's electronic medical record by the research team.

Analysis

Descriptive statistics were reported by numbers and percentages for categorical variables and mean (SD) or median (IQR) for numerical variables as appropriate. For univariate analysis, we used Spearman rank correlation to examine the relationship between the number of ACEs and depression severity. We used the Wilcoxon signed-rank test to examine the difference in the median number of adolescent ACEs reported by each adolescent compared with the number of adolescent ACEs reported by each adolescent's caregiver. Nontraditional ACEs were analyzed separately from traditional ACEs because there is currently no population-level data about the risk of disease associated with nontraditional ACEs. Wilcoxon signed-rank test or Kruskal-Wallis test was used to compare the PHQ-9A score among demographic subgroups. Multivariable linear regression was used to detect the independent association between ACE scores and PHQ-9A scores. Covariates with significant univariate association with depression severity were adjusted in the multivariable regression. A significant level was considered as alpha = 0.05. All analyses were performed using R Statistical Software (version 4.1.2; R Core Team 2021).[28]

Results

Demographics

Our study population included 46 adolescents and their caregivers forming 46 adolescent–caregiver dyads. Of the adolescent participants, the mean age was 15.46 ± 1.47 years, 29 (63%) were male, 18 (39%) Hispanic, and 13 (28%) African American (Table I).

Adolescent Self-Report of ACE Scores and Caregiver-Report of Adolescent ACE Scores

Fourteen (30%) of adolescents reported no traditional ACEs, 11 (24%) reported 1, and 21 (46%) reported more than 1. Sixteen (35%) of adolescents reported no nontraditional ACEs, 11 (24%) reported 1, and 19 (41%) reported more than 1 (Table II). We found that female adolescents as compared with male adolescents had a greater median self-report of traditional ACEs (3 [IQR 0-5] vs 1 [IQR 0-2]), $P = .025$. We found no meaningful difference in adolescent ACE scores by race/ethnicity, or age.

Twenty-seven (59%) of caregivers reported no traditional adolescent ACEs, 8 (17%) reported 1, and 11 (24%) reported more than 1. Thirty-one (67%) caregivers reported no nontraditional adolescent ACEs, 6 (13%) reported 1, and 9 (20%) reported more than 1 (Table II). The median caregiver report of adolescent traditional ACEs and nontraditional ACEs was significantly lower than adolescent self-report of traditional and non-traditional adolescent ACEs (traditional ACEs: 1 [IQR 0-3] vs 0 [IQR 0-1], $P = .003$; nontraditional ACEs: 1 [IQR 0-2] vs 0 [IQR 0-1]), $P = .002$ (Figure 1).

The absolute score difference between the adolescent self-report and the caregiver report of adolescent ACEs was calculated. Of the 46 dyads, adolescents reported a greater ACE

Table I. Demographic characteristics of adolescent participants

Characteristics	
Age	
Mean (SD)	15.46 (1.47)
Median (IQR)	15.5 (14, 16)
Range	(13, 19)
Gender, No. (%)	
Female	17 (37)
Male	29 (63)
Race, No. (%)	
Hispanic	18 (39.1)
African American	13 (28.3)
Other	7 (15.2)
Multiracial	5 (10.9)
White	3 (6.5)

score in 40 of the dyads, and caregivers reported a greater ACE score in 6 of the dyads. The absolute score difference ranged from 0 to 6 in the group in which the adolescent scored greater and 0 to 5 in which the caregiver scored greater.

PHQ-9A Scores

The mean PHQ-9A score was 4.24 ± 4.15 with a range of (0-13). According to PHQ-9A scores, more than one-half of the adolescents had no or minimal depression and none had severe depression (Table III). Female adolescents as compared with male adolescents had a greater median PHQ-9A score (6 [IQR 3-10] vs 1 [IQR 0-5]), $P < .05$. We found no meaningful difference in PHQ-9A score by race/ethnicity, or age.

PHQ-9A and Adolescent ACE Scores

Using Spearman correlation tests, we found a moderate positive correlation of PHQ-9A score with adolescent self-reported traditional ACEs ($r_s = 0.5$, $P < .001$) and nontraditional ACEs ($r_s = 0.49$, $P < .001$). Multivariable regression shows that after adjusting for gender, with 1 additional traditional ACE happening in childhood, the PHQ-9A score is expected to increase by 0.98 (95% CI 0.46-1.5) points, $P < .001$; and with 1 additional nontraditional ACE, the PHQ-9A is expected to increase by 1.72 (95% CI 0.78-2.66) points, $P < .001$ (Figure 2).

Table II. Adolescent and caregiver report of adolescent ACEs

ACEs	
Adolescent self-reported traditional ACEs	
Mean (SD)	2.04 (2.14)
Median (IQR)	1 (0, 3)
Range	(0, 8)
Caregiver-reported traditional ACEs	
Mean (SD)	1.13 (1.88)
Median (IQR)	0 (0, 1)
Range	(0, 7)
Adolescent self-reported nontraditional ACEs	
Mean (SD)	1.22 (1.09)
Median (IQR)	1 (0, 2)
Range	(0, 3)
Caregiver-reported nontraditional ACEs	
Mean (SD)	0.61 (1)
Median (IQR)	0 (0, 1)
Range	(0, 3)

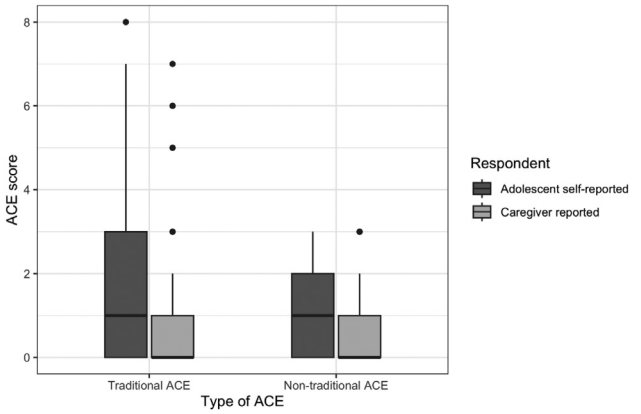

Figure 1. Comparison of median adolescent self-reported traditional and nontraditional ACEs and caregiver report of adolescent ACEs. The median caregiver report was significantly lower than the adolescent self-report of traditional and nontraditional adolescent ACEs. (Traditional ACEs: 1 [IQR 0-3] vs 0 [IQR 0-1], $P = .003$; nontraditional ACEs: and 1 [IQR 0-2] vs 0 [IQR 0-1], $P = .002$.).

Absolute Score Difference between Adolescent Self-Report and Caregiver Report of Adolescent ACEs and PHQ-9A Score

The absolute score difference between adolescent self-report of ACEs and caregiver report of adolescent ACEs was compared with PHQ9-A scores. There was a positive correlation between the absolute value of adolescent and caregiver reports of traditional adolescent ACEs and PHQ-9A scores (n = 46, ρ = 0.51, $P < .001$). This moderate positive correlation is statistically significant in the subgroup of patients who reported a greater number of ACEs than their caregiver (n = 40, ρ = 0.5, $P < .001$) but not statistically significant in the subgroup of patients whose caregiver reported a greater score (n = 6, ρ = 0.77, $P = .072$) (Figure 3).

Table III. Adolescent PHQ-9A and depression severity

Scores	
PHQ-9A score	
Mean (SD)	4.24 (4.15)
Median (IQR)	3 (1, 7)
Range	(0, 13)
Depression severity, No. (%)	
No or minimal depression	26 (57%)
Mild depression	14 (30%)
Moderate depression	6 (13%)

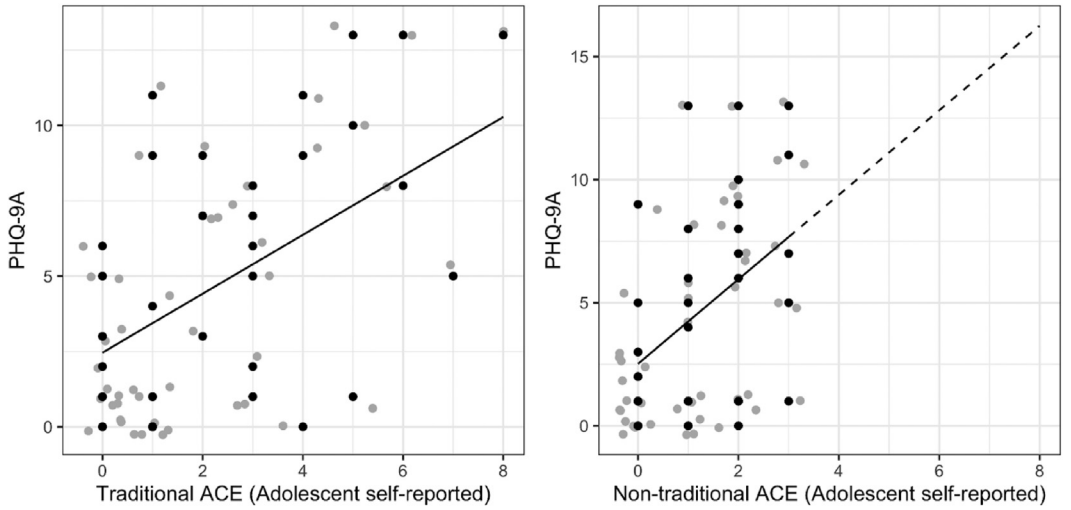

Figure 2. Correlation between adolescent self-reported traditional and nontraditional ACEs and PHQ-9A score. There was a moderate positive correlation of PHQ-9A score with adolescent self-reported traditional ACEs ($r_s = 0.5$, $P < .001$) and nontraditional ACEs ($r_s = 0.49$, $P < .001$).

Discussion

The findings of this pilot study are consistent with the literature supporting the growing evidence that ACEs are linked to an increased risk of depression in adolescents.[18-24] This study sheds light on the discrepancies between caregiver and adolescent reports of adolescent ACEs. We found that caregivers tend to under-report adolescent ACEs compared with adolescents, potentially as the result of fear, denial, or lack of awareness of their child's experiences.[29,30] The underestimation of adolescent ACEs by caregiver reports emphasizes the importance of incorporating multiple perspectives in assessment and the need for additional research to better understand the factors influencing the caregiver's perception and reporting of adolescent ACEs. Furthermore, our analysis revealed notable findings regarding the agreement between adolescent self-report and caregiver report of adolescent ACEs and its association with adolescent depression.

There was a positive correlation between the adolescent and caregiver absolute score difference of adolescent ACEs and depression. The larger the discrepancy between adolescent and caregiver reports of adolescent ACEs, the greater the level of adolescent depression. Even if both caregiver and adolescent reported a high number of adolescent ACEs with a low absolute score difference, the PHQ-9A

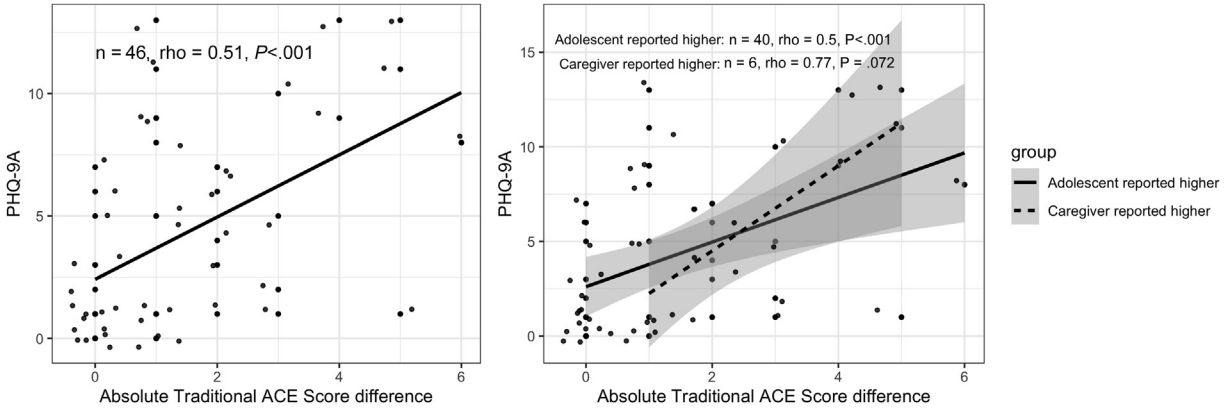

Figure 3. Correlation between adolescent PHQ-9A and the absolute difference between adolescent and caregiver ACE. This moderate positive correlation is statistically significant in the subgroup of patients who reported a greater number of ACEs than their caregiver (n = 40, $\rho = 0.5$, $P < .001$) but not statistically significant in the subgroup of patients whose caregiver reported a greater score (n = 6, $\rho = 0.77$, $P = .072$). The *left graph* includes all patients, and the *right graph* visualizes the relationship by subgroups on the basis of whether an adolescent reported a greater score than their caregiver.

score was relatively lower compared with if there was a high absolute ACE score difference. This finding may imply that adolescents and caregivers with open communication may have favorable mental health outcomes; however, further research is needed to assess this association.[18,29,30]

The positive correlation between adolescent self-reported ACEs and depression severity highlights the importance of incorporating ACE screening as a standard of care in adolescent health care settings. There is a notable correlation between nontraditional adolescent ACEs and adolescent mental health compared with traditional ACEs. Health care providers should be equipped with comprehensive ACE screening tools that encompass both traditional and nontraditional ACEs to ensure a more accurate assessment of an adolescent's risk for mental health issues.[31] Integrating ACE screening into routine adolescent health assessments can help identify those who may benefit from early intervention and support, potentially reducing the long-term effect of ACEs on mental health outcomes.[31]

There are several limitations to the study that should be acknowledged. The small sample size limits the generalizability of the findings, and the cross-sectional design prevents causal conclusions. Future research should also aim to replicate these findings in larger and more diverse samples. It should be noted that the PHQ-9A is a validated screening tool but not a diagnostic tool for depression. This distinction is important in interpreting our results and emphasizes the need for further clinical assessments to confirm depression diagnoses. In addition, the CYW ACE questionnaire is not a validated screening tool for ACEs. Moreover, the reliance on self-report measures may introduce recall or reporting biases. Another noteworthy limitation is the absence of adjustment for socioeconomic status in the analysis. Given the well-established effect of socioeconomic factors on mental health outcomes, the lack of adjustment may introduce confounding variables, affecting the generalizability of our findings. Furthermore, the study did not include an examination of protective factors in addition to ACEs in the analysis. Understanding the interplay between adverse experiences and protective factors is vital for a comprehensive understanding of adolescent mental health. Future research should consider incorporating both risk and protective elements to provide a more nuanced perspective.

Despite these limitations, our findings highlight the importance of understanding the relationship between adolescent and caregiver reports of adolescent ACEs and adolescent depression. By acknowledging the influence of ACEs and their effect on adolescent mental health, health care providers and caregivers can collaborate to create supportive environments and intervention strategies that foster resilience and mitigate the long-term effects of childhood adversity.[31-34] ■

CRediT authorship contribution statement

Tatiana Ndjatou: Writing – review & editing, Writing – original draft, Methodology, Investigation, Conceptualization. **Yuqing Qiu:** Writing – review & editing, Writing – original draft, Formal analysis, Data curation. **Linda M. Gerber:** Writing – review & editing, Writing – original draft, Formal analysis, Data curation. **Jane Chang:** Writing – review & editing, Writing – original draft, Supervision, Methodology.

Declaration of Competing Interest

The authors report no conflicts of interest.

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