

# The Modifying Effect of Sports Participation on the Association Between Adolescents with Adverse Childhood Experiences and Depression

Milan Jaiswal | AVA Global Health Summit

 UTHealth<sup>®</sup> Houston  
McGovern Medical School

# ACE Exposure Increases Depression Risk – Can Playing Sports Help?

- ~50% of US children have been exposed to  $\geq 1$  adverse childhood experience (ACE)
- Risk of depression increases as the number of ACEs increases
- ACE exposure is associated with lower sports participation, compared to no ACE exposure

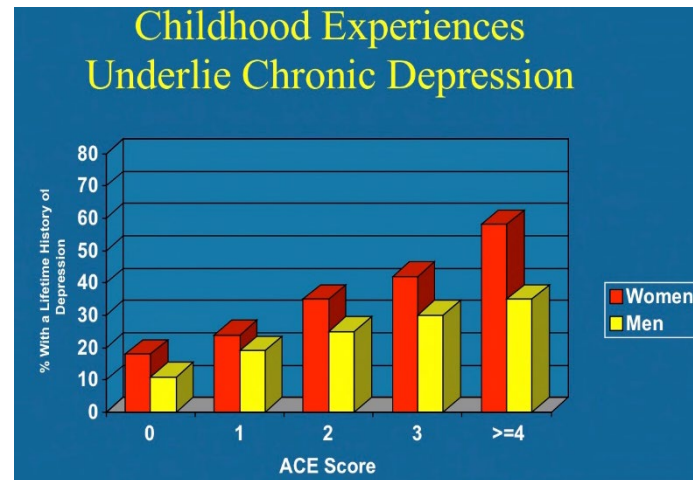


Table 2

ACEs Predicting Sport Participation, (2017–2018, National Survey of Children’s Health) [N = 23,557].

	OR (95% CI) <sup>a</sup>	aOR (95% CI) <sup>b</sup>
No ACEs	ref	ref
One	0.64 (0.55–0.75)***	0.77 (0.65–0.91)**
Two	0.63 (0.52–0.77)***	0.80 (0.63–1.02)
Three or More	0.54 (0.45–0.63)***	0.78 (0.63–0.95)*

Noel-London, K., Ortiz, K., & BeLue, R. (2021). Adverse childhood experiences (ACEs) & youth sports participation: Does a gradient exist? *Child Abuse & Neglect*, 113, 104924. <https://doi.org/10.1016/j.chiabu.2020.104924>

# Our Study

- Sports participation could potentially serve as a **treatment modality** or **protective factor** for depressive symptoms among children and adolescents exposed to ACE
- Goal: To determine if sports participation ***modified the association*** between ACE exposure and symptoms of depression among adolescents in the US
- Hypothesis: Adolescents who experienced ACEs and participated in sports would have lower odds of depressive symptoms compared to those who did not participate in sports

# Methods

- Data from the 2019 National Survey of Children's Health (NSCH)
- n=12,230 adolescents aged 12-17 years old
- Depression and Sports Participation coded as binary responses
- Covariates
  - Age, gender, race/ethnicity, body mass index (BMI), health status, insurance status, household income level, sleep hours, sedentary hours, and physical activity
- Statistical Analysis
  - Multivariable logistic regression

# Results - Descriptive

- 48.8% female respondents
- 49.9% non-Hispanic White
- Mean (SD) age was 14.47 (0.04) years
- 40.7% reported 1-3 ACEs, 8.3% reported 4+ ACEs
- 55.7% sports participants
- 7.2% have depression

# Results - Bivariate

**Table 2:** Bivariate Analysis of Sports Participation/ACEs and Depression with Relevant Covariates

Characteristics	Depression			p-value
	No n (weighted %)	Yes n (weighted %)	Missing n (weighted %)	
<b>ACES</b>				<0.001
0 aces	6099 (50.8)	250 (21.3)	25 (37.0)	
1-3 aces	4251 (40.0)	555 (50.2)	31 (34.1)	
4+	596 (6.8)	224 (25.7)	19 (26.0)	
Missing	170 (2.3)	9 (2.7)	1 (2.9)	
<b>Participation in sports activities</b>				<0.001
No	3910 (40.9)	626 (63.2)	38 (42.5)	
Yes	7031 (57.3)	403 (36.4)	35 (51.6)	
Missing	175 (1.9)	9 (0.4)	3 (5.9)	

# Results – Logistic Regression

- No sports participation
  - 1-3 ACEs: aOR = 2.1 (1.4-3.2)
  - 4+ ACEs: aOR = 7.3 (4.2-12.7)
- Sports participation
  - 1-3 ACEs: aOR = 3.0 (1.9-4.9)
  - 4+ ACEs: aOR = 5.2 (2.9-9.4)

**Table 3:** Multivariable Logistic Regression of ACEs and Depression Stratified by Sports Participation

Number of ACEs	aOR (95% CI)
<i>All participants</i>	
0	ref
1-3	2.5 (1.7-3.5)
4+	7.0 (4.6-10.6)
<i>No sport participation</i>	
0	ref
1-3	2.1 (1.4-3.2)
4+	7.3 (4.2-12.7)
<i>Sports participation</i>	
0	ref
1-3	3.0 (1.9-4.9)
4+	5.2 (2.9-9.4)

# Conclusions

- The results of the analysis are partly conflicting with what was originally hypothesized
- Depression was less prevalent in those who participated in sports
- In children with 1-3 ACEs, the odds of depression are slightly higher in those who participated in sports than those who did not
- In children with 4+ ACEs, the odds of depression are lower in those who participated in sports than those who did not
- These findings do not establish a clear dose-dependent association, but sports participation may still be serving as a modifier



# Future Directions

- Sports participation could have a modifying role in the association between ACE exposure and depression
  - The direction and magnitude of this role needs to be further evaluated
- Sports participation still has benefits to health outside of depression
- Improve measurement of ACEs to better determine associations with health outcomes
- Screening for ACEs should be more widespread, and efforts to mitigate the negative health outcomes need to be implemented

# Acknowledgments

- Gregory Knell, MS, PhD
- Lauren Malthaner, MPH
- Madison Bolin, MPH
- UTHealth Houston School of Public Health
- UTHealth Houston McGovern Medical School