ACE Incidence and Impact Research Project

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ACE Team: Danielle Darter MD, DCOMK, PI, Co-PIs: Gary Vroegindewey, CVM-DCOMH; Jason Kishpah, LPC-MHSP, LMU-Harrogate; Gina DeFranco DO, DCOMK; Brandy Fuesting DrPH, MPH, DCOMK; Rick Slaven, MPS, NRP, CCP, DCOMH; Lauren Wisienski, MS, PhD, and Chloe Ruff, PhD

LMU

DeBusk College *of* Osteopathic Medicine

LINCOLN MEMORIAL UNIVERSITY

VALUES | EDUCATION | SERVICE

Introduction

- Multidisciplinary project between LMU-CVM and LMU-DCOM comparing ACE data from two professional schools.
  - Separate IRB approval obtained for LMU-CVM and LMU-DCOM.
  - Today we are presenting the LMU-DCOM portion.

ACE Research Team

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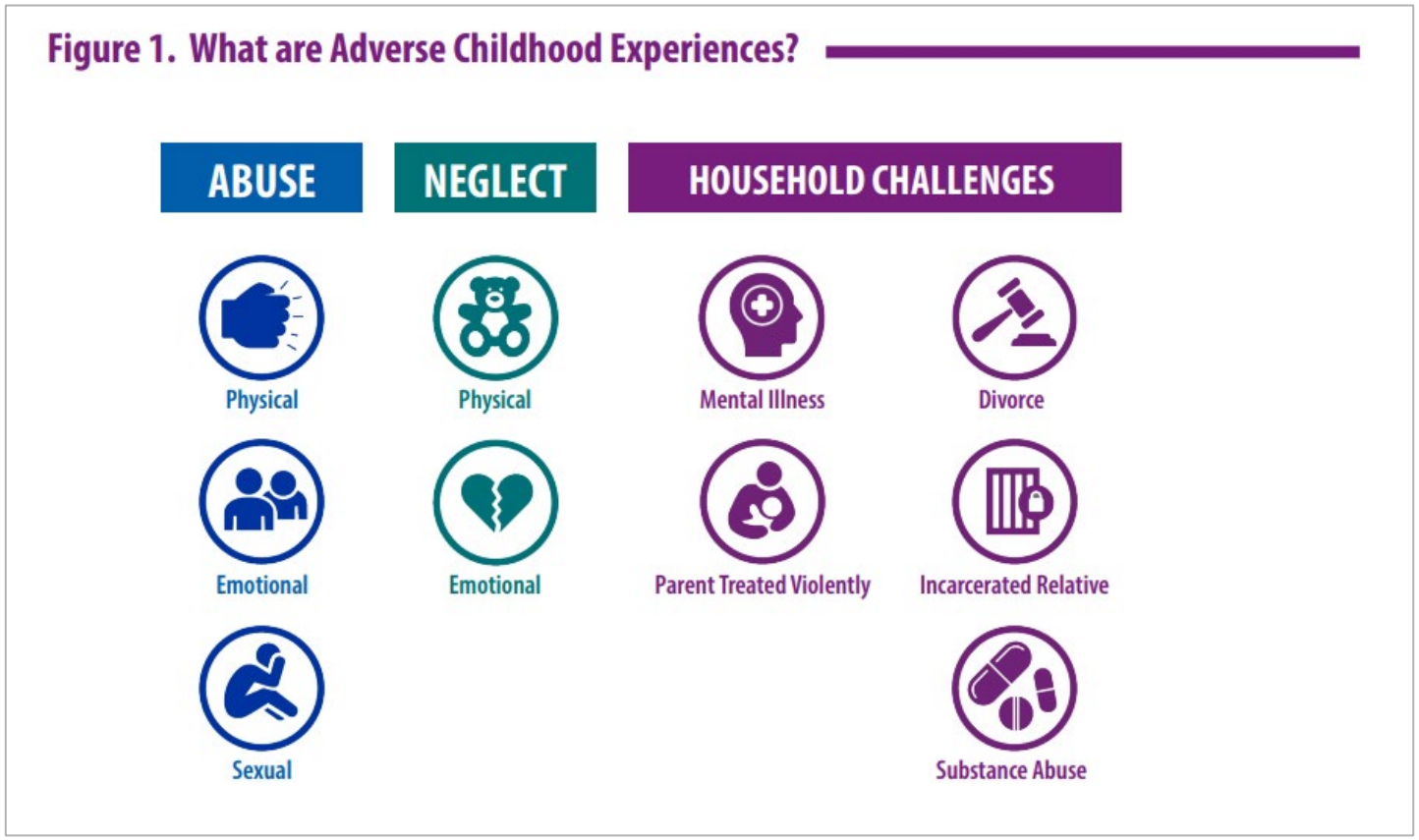
Adverse Childhood Experiences



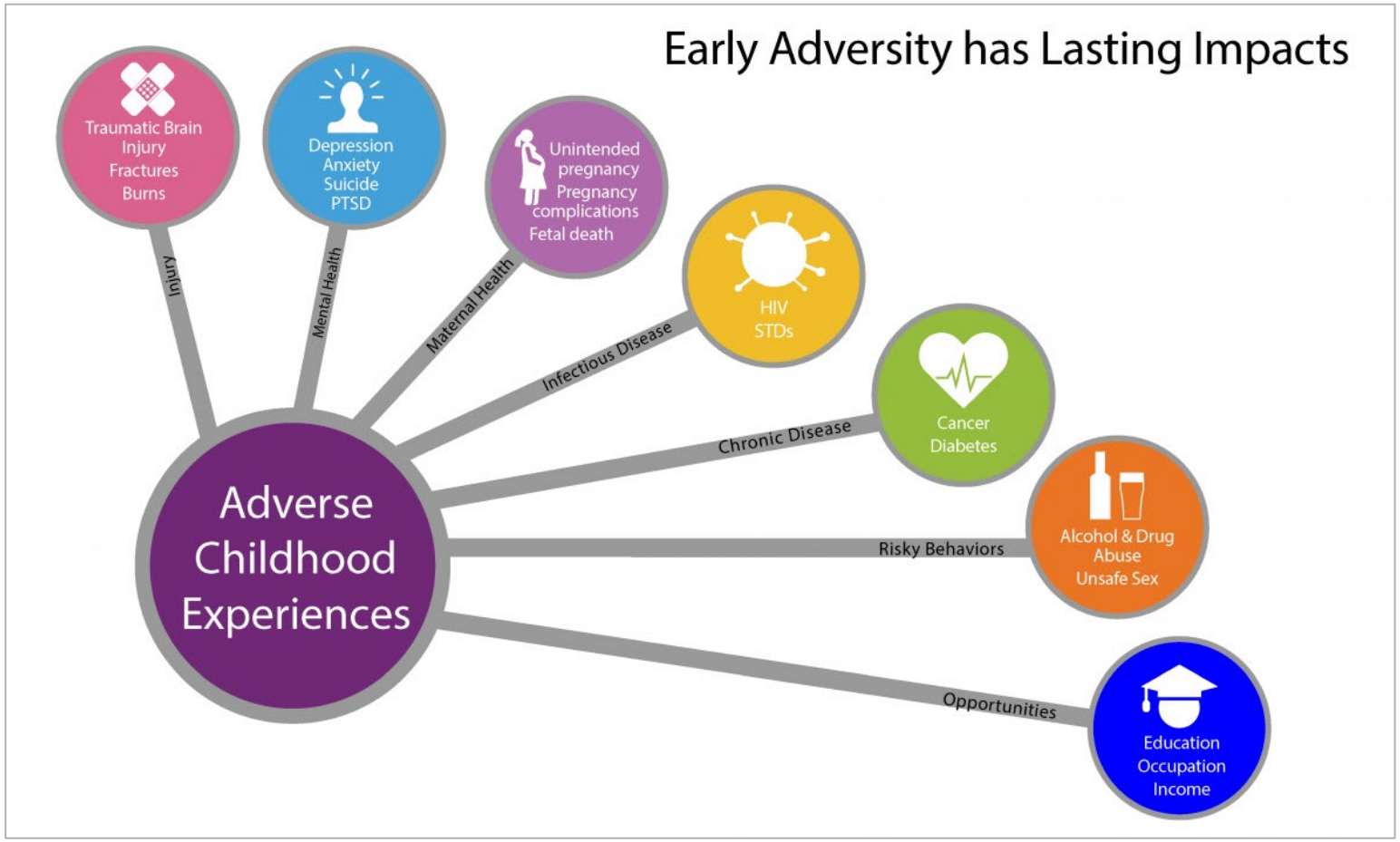
Elevated ACE Score

- An ACE Score of 4 or more is considered “elevated”
- An ACE Score of 4 or more increases risks for long term health conditions and professionalism issues.
- National data reports elevated ACE scores(4 or more) between 16 and 21%

Expanded ACE Questions

Philadelphia Expanded ACE Questions look at Community-Level Adversity	
Witness Violence	How often, if ever, did you see or hear someone being beaten up, stabbed, or shot in real life?
Felt Discrimination	While you were growing up...How often did you feel that you were treated badly or unfairly because of your race or ethnicity?
Adverse Neighborhood Experience	Did you feel safe in your neighborhood? Did you feel people in your neighborhood looked out for each other, stood up for each other, and could be trusted?
Bullied	How often were you bullied by a peer or classmate?
Lived in Foster Care	Were you ever in foster care?

Impact of ACEs



ACEs and Professionalism

- Adverse Childhood Experience (ACE) exposure is associated with professionalism issues in medical school and throughout subsequent medical careers.

TRAUMA-INFORMED CARE IN PRACTICE

by Breyta Psychological Services, P.A.
(919) 245-7791 | breytapsych.com

Trauma-informed care (TIC) provides a framework for health care providers and institutions to decrease persistent traumatic stress responses in their patients. Benefits for providers and patients are powerful and far-reaching.

FOR PATIENTS

Offers the opportunity to engage more fully in their health care, develop a trusting relationship with their provider, resists re-traumatization, and improves long-term health outcomes.

FOR PROVIDERS

Helps reduce burnout among health care providers, potentially reducing staff turnover, and strengthens provider-patient alliance.

SAFETY

- Recognize presence of trauma symptoms or trauma history
- Allow patient to face doorway
- Always greet patient and family
- Make eye contact
- Ask if patient is aware of triggers
- Respect privacy

CHOICE

- Provide clear and appropriate message about rights and responsibilities
- Whenever possible, emphasize patient has choice and control
- Emphasize informed decisions
- *Ask permission* before touching patient or performing procedures

COLLABORATE

- Do things *with*, not *for*, the patient
- Share power by including patient in decision-making process
- Patient has significant role in planning and evaluating service
- Ask preferred name / pronouns
- Ask questions to assess symptoms of distress

TRUST

- Clearly and simply explain what you are about to do *before* you do it; be consistent
- Respectful and professional boundaries are maintained
- Respond calmly and non-judgmentally to strong emotion

EMPOWER

- Validate and affirm experience
- Provide education on patient condition and procedures
- Teach skills to manage pain and anxiety during procedure

Research Questions

- What percentage of LMU-DCOM students have elevated ACE scores (>= 4)?
- Is there a correlation between elevated ACE scores and academic performance?

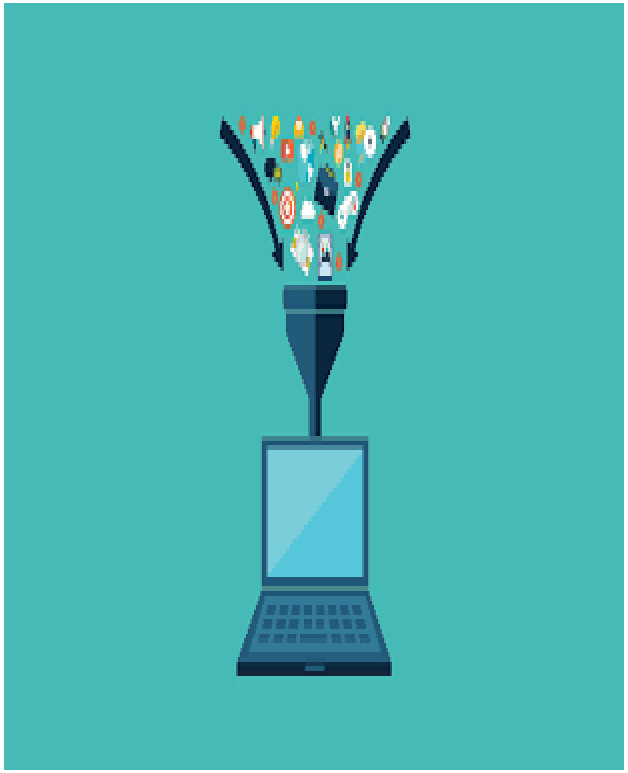
Study Objectives

- Objective 1
  - Measure the prevalence of elevated Adverse Childhood Event (ACE) scores (>= 4) in LMU-DCOM classes of 2023, 2024, and 2025.
- Objective 2
  - Determine if there is correlation between elevated ACE scores and academic performance in our cohort of students.

Methods and Data Collection

- LMU-DCOM 2023, 2024 and 2025 class members (1072 total) received Qualtrics survey utilizing the expanded ACE questionnaire.
  - The questionnaire was voluntary.
- Scoring Method:
  - Philadelphia Adverse Childhood Experiences (PHL ACEs) scoring method was utilized.
  - The number of ACEs were categorized as 0, 1-3, 4+ according to the PHL ACEs.
- Analysis Software: Stata Version 17.0
  - Participants were removed from the dataset that did not provide identifiers for linkage to GPA data and did not answer all questions required to calculate the ACE score.

Methods and Data Collection



- Demographics were screened for an association with ACE category using chi-square tests. Fisher's exact test was used when expected counts were <5.
- All demographics that were significantly associated with ACEs were included for screening in the multivariable model.
- A linear mixed model was built to test the association of ACE category and GPA. A random intercept for class was included to adjust for shared variance within class.
- Residuals were checked for normality and homoscedasticity using boxplots and histograms. Levene's test was also used to test for homoscedasticity.
- The final model met all statistical assumptions. Statistical significance was set at $P \leq 0.05$.

Study Results

1. 1073 students received the invitation to complete the survey
2. 160 responded to the survey, 11 were removed due to incomplete data
3. 149 participants were included in the analysis.
4. 45% of participants had a conventional ACE score of 4 or more.
5. 44% had at least 1/5 expanded ACEs

Results

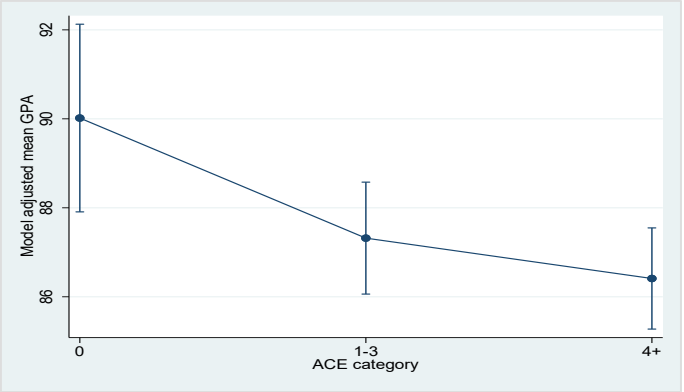
	0 ACES (n = 19)		1-3 ACES (n = 57)		4+ ACES (n = 73)			
	n	P (95% CI)	n	P (95% CI)	n	P (95% CI)	Chi-square (df)	p-value
Gender[1]							0.52 (2)	0.77
Male	6	31.2 (12.6-56.6)	14	25.0 (14.4-38.4)	22	30.1 (19.9-42.0)	-	-
Female	13	68.4 (43.4-87.4)	42	75.0 (61.6-85.6)	51	69.9 (58.0-80.1)	-	-
Race[2]							5.12 (4)	0.34
White	16	84.2 (60.4-96.6)	47	82.5 (70.1-91.3)	50	68.5 (56.6-78.9)	-	-
Black	0	0 (0.0-17.6)[3]	3	5.3 (1.1-14.6)	7	9.6 (3.9-18.8)	-	-
Other or mixed race	3	15.8 (3.4-39.6)	7	12.3 (5.1-23.7)	16	21.9 (13.1-33.1)	-	-
Age[2]							2.77 (4)	0.65
19-24	5	26.3 (9.1-51.2)	10	17.5 (8.7-29.9)	15	20.5 (12.0-31.6)	-	-
25-30	14	73.7 (48.8-90.9)	42	73.7 (60.3-84.5)	50	68.5 (56.6-78.9)	-	-
31+	0	0 (0.0-17.6)[3]	5	8.8 (2.9-19.3)	8	11.0 (4.9-20.5)	-	-
Marital Status[2]							1.64 (4)	0.78
Married	5	26.3 (9.1-51.2)	17	29.8 (18.4-43.4)	20	27.4 (17.6-39.1)	-	-
Coupled	5	26.3 (9.1-51.2)	11	19.3 (10.0-31.9)	11	15.1 (7.8-25.4)	-	-
Separated, Divorced, Widowed, or Never Married	9	47.4 (24.4-71.1)	29	50.9 (37.3-64.4)	42	57.5 (45.4-69.0)	-	-
Income[2]							8.04 (6)	0.26
$0-24,999	11	57.9 (33.5-79.7)	34	59.6 (45.8-72.4))	49	67.1 (55.1-77.7)	-	-
$25,000-49,999	5	26.3 (9.1-51.2)	7	12.3 (5.1-23.7)	10	13.7 (6.8-23.8)	-	-
$50,000-74,999	1	5.1 (0.1-26.0)	12	21.1 (11.4-33.9)	6	8.2 (3.1-17.0)	-	-
$75,000 or more	2	10.5 (1.3-33.1)	4	7.0 (2.0-17.0)	8	11.0 (4.9-20.5)	-	-
Class[2]							4.12 (4)	0.39
2023	2	10.5 (1.3-33.1)	15	26.3 (15.5-39.7)	16	21.9 (13.1-33.1)	-	-
2024	7	36.8 (16.3-61.6)	17	29.8 (18.4-43.4)	16	21.9 (13.1-33.1)	-	-
2025	10	52.6 (28.9-75.6)	25	43.9 (30.7-57.6)	41	56.2 (44.1-67.8)	-	-
Children[2]							4.16 (2)	0.17
Yes	0	0 (0-17.6)[3]	8	14.0 (6.3-25.8)	5	6.8 (2.3-15.3)	-	-
No	19	100 (82.4-100.0)[3]	49	86.0 (74.2-93.7)	68	93.2 (84.7-97.7)	-	-
Employed[2]							0.18 (2)	0.89
Yes	3	15.8 (3.4-39.6)	7	12.3 (5.1-23.7)	9	12.3 (5.8-22.1)	-	-
No	16	84.2 (60.4-96.6)	50	87.7 (76.3-94.9)	64	87.7 (77.9-94.2)	-	-

Table 1: Demographic characteristics stratified by ACE score category in a sample of Osteopathic medical students (N = 149)

Results

- Participants with ACE scores of 4 or more had slightly lower average of GPAs (86) vs participants with ACE scores of 0 (90).
- This is a significant association between lower GPAs and elevated ACE scores.
- For LMU-DCOM, 86 is on the edge of the 3rd and 4th quartile for class rank, whereas 90 is the 1st quartile.

Figure 1: Marginal linear predictios for average GPA by ACE category in a sample of osteopathic medical students (N = 149)[1]



Limitations of Study

1. Volunteer bias
2. Lack of incentive
3. Response rate
4. Difficulty comparing our data to national data

Conclusions

- The average of Americans with an ACE score of >+4 is 12%, the average Philadelphia ACE score of 4 or more is 21.5%.
- The study cohort had a significantly higher percentage of elevated ACE scores than other studies at 49%.
- We found a small but significant association between elevated ACE scores and lower GPAs.

What's Next?

- Exploration of Resilience Training and Trauma Informed Self-Care Courses at LMU-DCOM may prove beneficial due to the high percentage of elevated ACE scores within the study cohort.
- A goal of LMU-DCOM is to prepare Student Doctors for residency.
  - Mitigating the impact of elevated ACEs may enable students to be more academically competitive and better prepared for the next step in their medical education.

Thank you!
What questions do you have?