



Introduction

- CDC defines Adverse Childhood Experiences (ACEs) as potentially traumatic events that occur in childhood (0-17 years old).
- ACEs include abuse, household challenges, and neglect, such as:
 - Abuse: emotional, physical, sexual
 - Household challenges: separation, domestic violence, substance abuse, mental illness, incarcerated household member
 - Neglect: emotional and physical
- Multiple ACEs increase the risk of negative outcomes, underscoring the need for early intervention (Hughes et al., 2017).
- Toxic stress, resulting from prolonged exposure to ACEs, can impair brain development and immune function, further contributing to lifelong health challenges (Bucci et al., 2016).
- Goal: To examine the association between diet, stress, and sociodemographic factors by investigating a cohort of children aged 2-6 undergoing general anesthesia for routine elective surgical procedures at the University of Iowa Stead Family Children's Hospital.

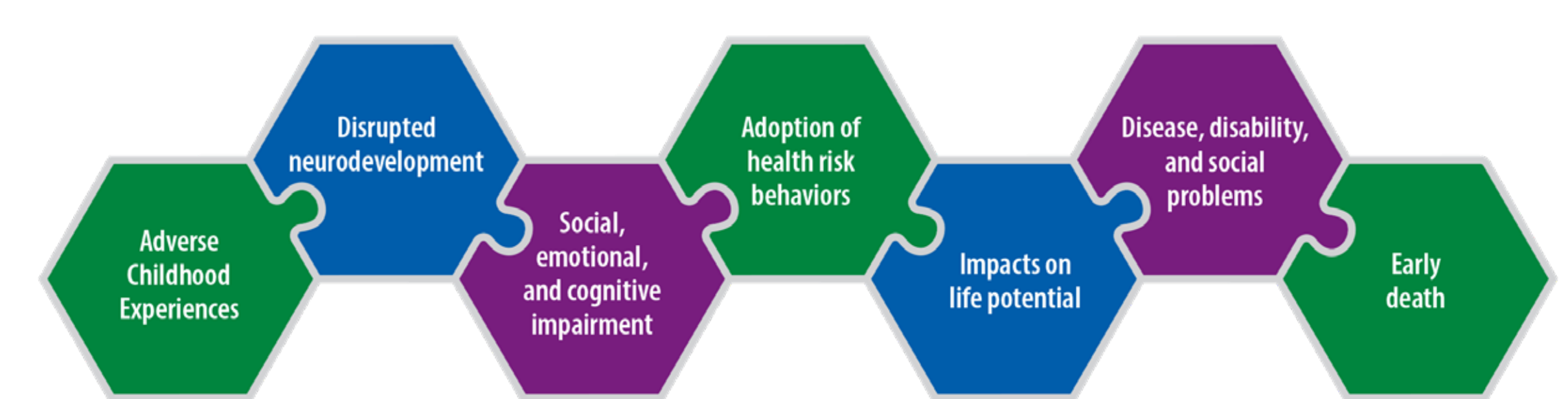


Figure 1. Adverse Childhood Experiences (ACEs) are a major public health concern with long-term effects [Centers for Disease Control and Prevention (2019). *Preventing Adverse Childhood Experiences: Leveraging the Best Available Evidence*]

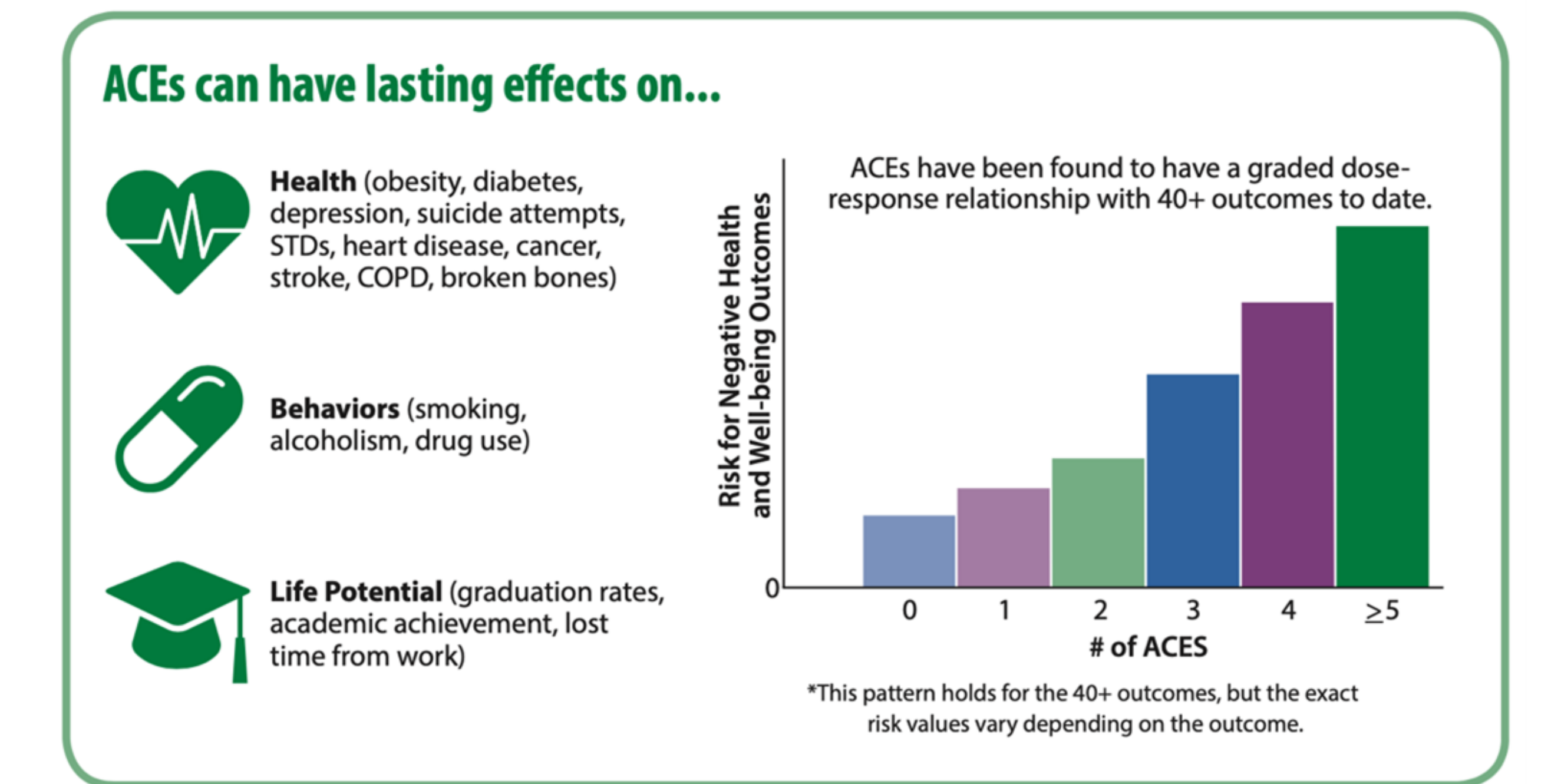


Figure 2. The lasting impact of adverse childhood experiences (ACEs) on health, behaviors, and life potential [Centers for Disease Control and Prevention (2019). *Preventing Adverse Childhood Experiences: Leveraging the Best Available Evidence*]

Methods

Legal guardians of eligible children will complete a questionnaire addressing health, diet, oral hygiene practices, sociodemographic variables, and psychological distress. Data collection, survey administration, and sample processing are currently ongoing.

The current analysis is based on data from 15 questionnaires completed by the mothers of the subjects. Questions regarding diet, stress, and sociodemographic factors from the questionnaire were selected for this analysis. Annual household income levels were recorded and this analysis includes the highest level of education attained by either of the two legal guardians. Each subject obtained a cariogenic diet score and aggregate household stress score.

Cariogenic Diet Score

Subjects were assigned a score based on the presence of dental caries and responses indicating the consumption of cariogenic foods or beverages reported throughout the week based on four questions. Points were assigned to subject based on the following examples:

- Caries present (1 point)
- In a typical week, how often does your child eat carbohydrates, such as hot and cold cereals, rice, pasta, spaghetti, crackers (including Goldfish), breads, and/or tortillas?
 - 1 – 3 times per week (1 point)
 - 4 – 6 times per week (2 point)
 - Once a day (3 points)
 - More than once a day (4 points)
- Which beverages does your child drink at least once a week? (Please select all that apply)
 - Baby formula (1 point)
 - Breast milk (1 point)
 - Cow's milk (1 point)
 - Chocolate milk (2 points)
 - Plant based milk (2 points)
 - Soda or pop (3 point)
 - Sports drinks (3 point)
 - 100% Juice (2 point)
 - Juice drinks (3 point)
 - Water (1 point)

Aggregate Household Stress Score

Multiple stress scores (Child's stress score, Caretaker's Emotions Score, and Caretaker's Stress Score) were calculated to determine aggregate household stress. An aggregate Household Stress Score was calculated by combining individual stress scores from all relevant questions.

The Child's Stress Score was derived from affirmative responses to six questions within the questionnaire, such as:

- Has your child ever witnessed drug or alcohol abuse?
 - no
 - yes (1 point)

The Caretaker's Emotions Score was determined by responses indicating emotional distress as reflected in four questions, such as:

- Within the last year, have you felt so depressed that nothing could cheer you up?
 - none of the time (0 point)
 - a little of the time (1 point)
 - some of the time (2 point)
 - most of the time (3 point)
 - all of the time (4 point)

The Caretaker's Stress Score was based on affirmative responses to six questions, such as:

- In the past year have you had transportation problems that have prevented you or your child from attending work or school, or attending medical or dental visits?
 - no
 - yes (1 point)

Results

- Race & Ethnicity: 53% (8) identified as white/Caucasian; 20% (3) identified as white/Caucasian, Hispanic or Latino/a; 20% (3) identified as white/Caucasian, Black or African American; 7% (1) identified as white/Caucasian, Asian
- Insurance Type: 53% (8) participate in Iowa Medicaid, 40% (6) participate in private insurance, 7% (1) participate in both insurance types
- Families with higher levels of education tend to have higher annual household incomes (Figures 3)
- Families with higher cariogenic diet score tend to have lower annual household incomes (Figure 4)
- Households with lower annual income levels tend to have higher household stress scores (Figure 5)
- Families with higher cariogenic diet scores tend to have lower degrees of education (Figure 6)
- No current trends regarding households with high stress scores and high cariogenic diet scores

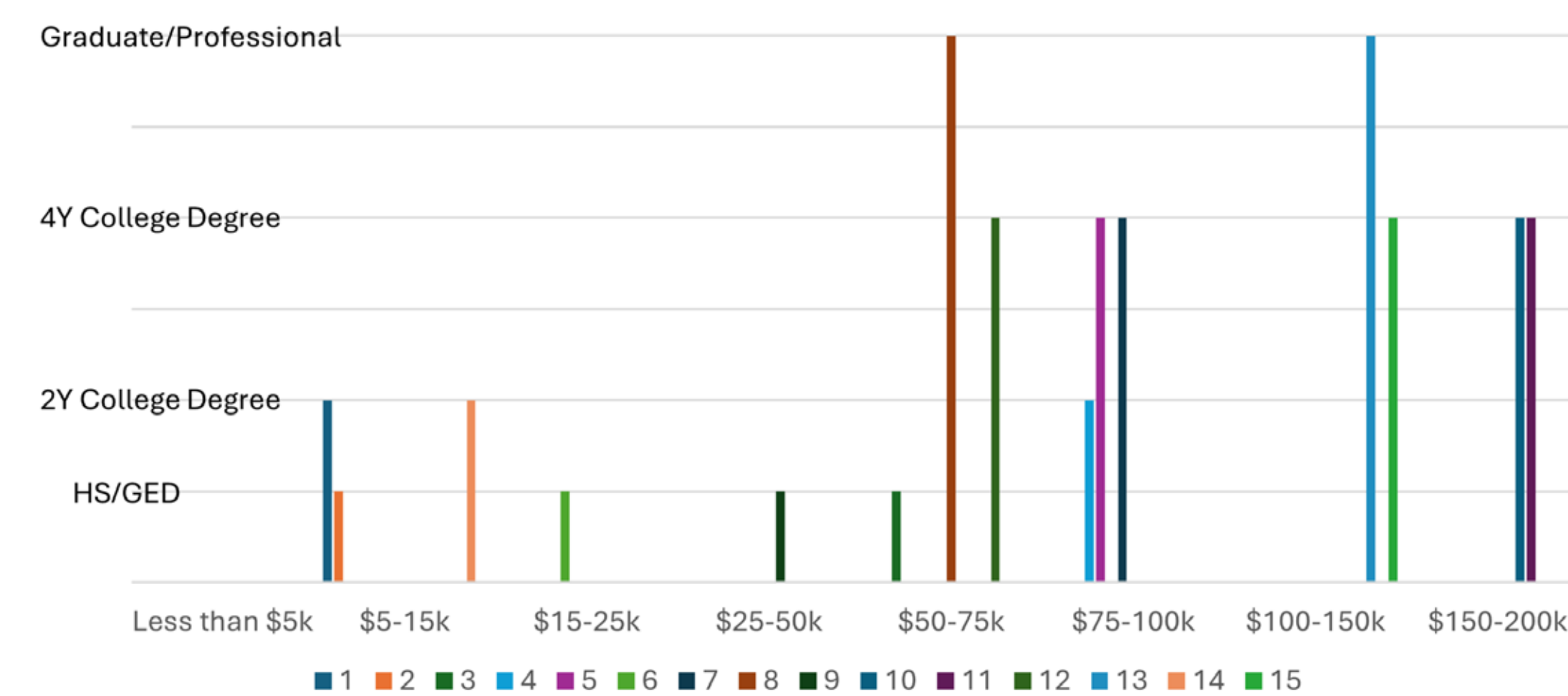


Figure 3. Highest Degree of Education vs. Annual Household Income Level

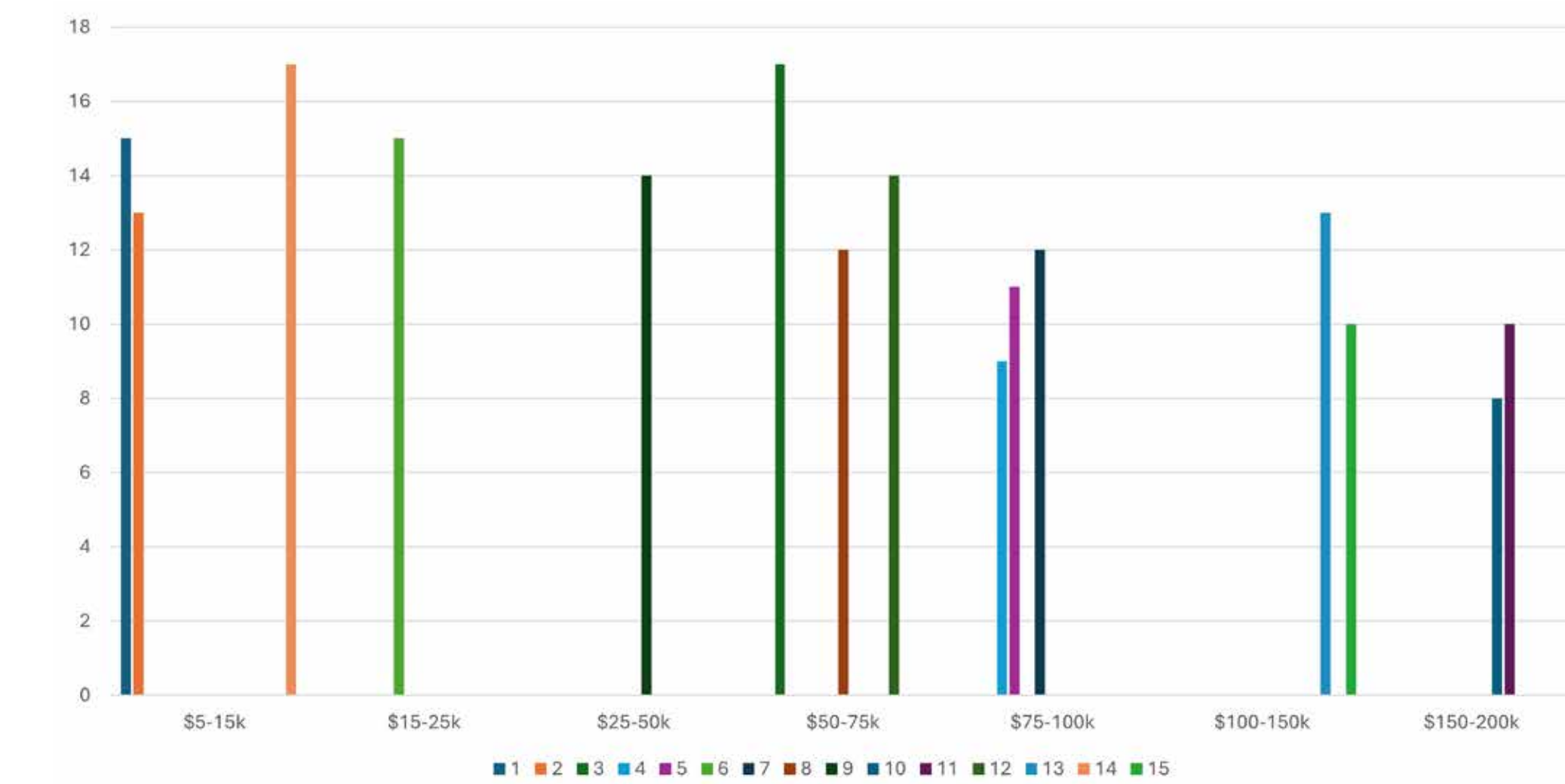


Figure 4. Cariogenic Diet Score vs. Annual Household Income Level

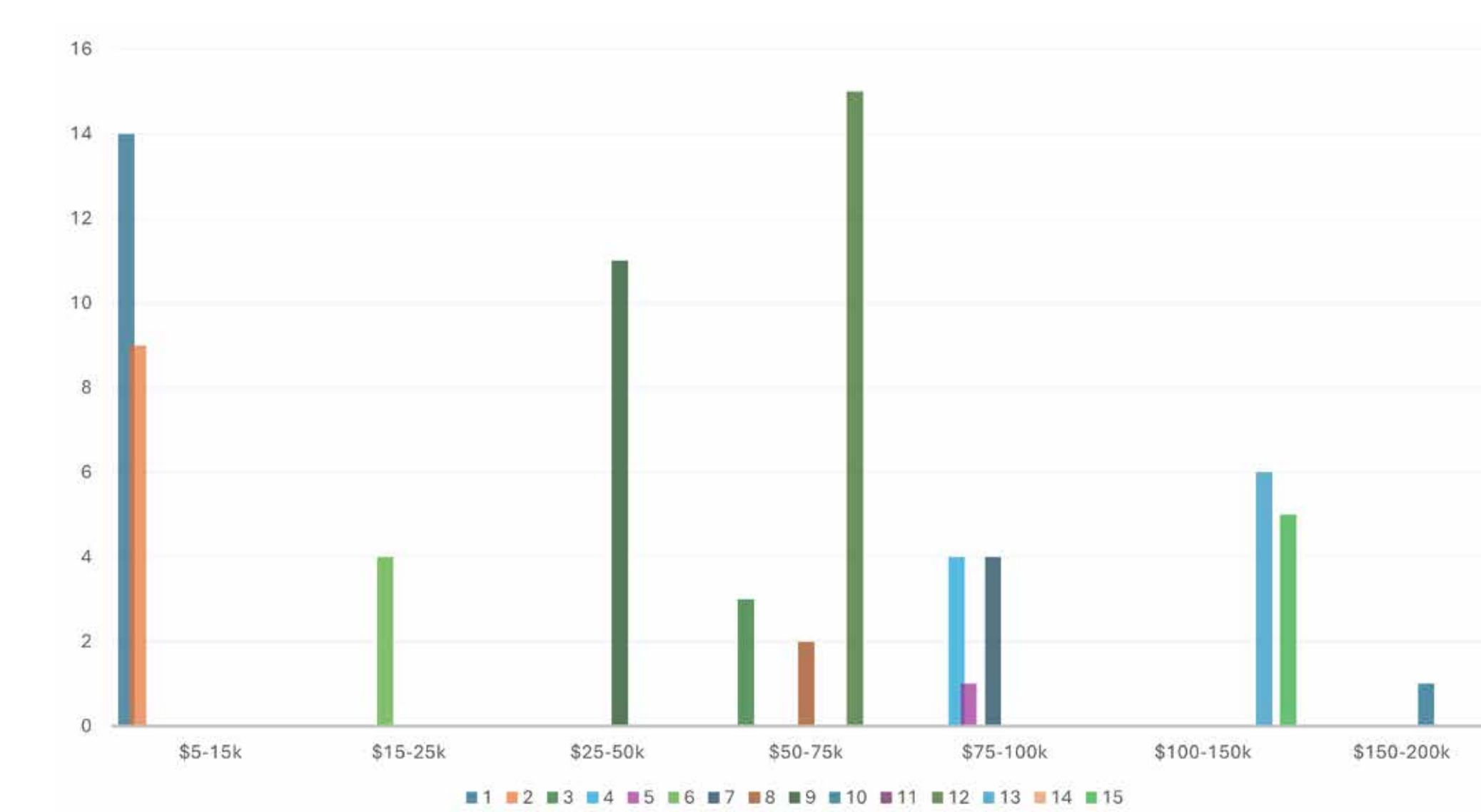


Figure 5. Aggregate Household Stress Score vs. Annual Household Income Level

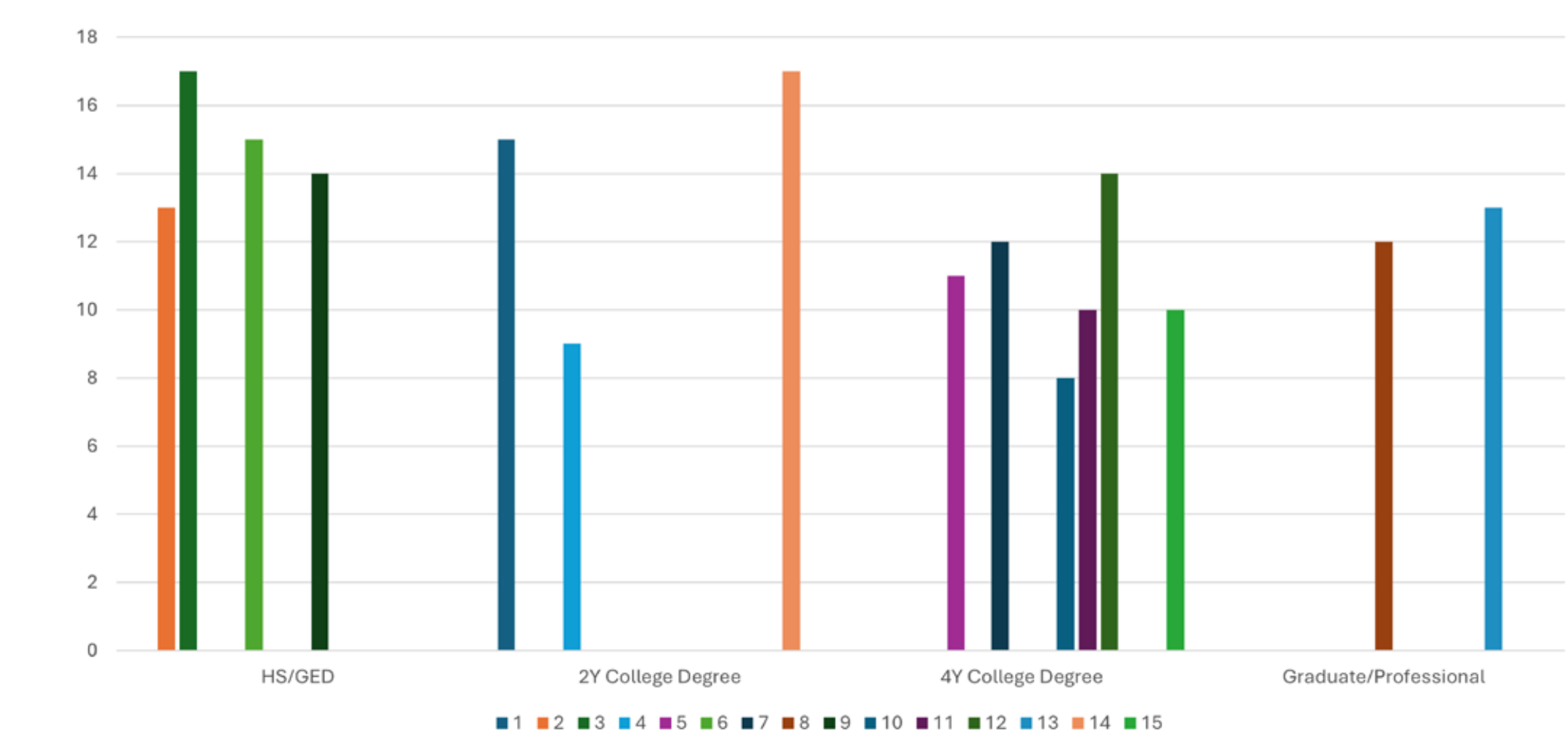


Figure 6. Highest Degree of Education vs. Cariogenic Diet Score

Conclusion

- Current findings indicate notable trends between legal guardian education levels, household income, overall stress, and cariogenic dietary habits.
- As data collection progresses, this study seeks to further elucidate the relationships between diet, stress, and sociodemographic factors in shaping pediatric oral health outcomes.
- Research highlights the importance of preventing ACEs, with evidence-based strategies proving effective in promoting long-term health (Figure 7).

Preventing ACEs	
Strategy	Approach
Strengthen economic supports to families	<ul style="list-style-type: none">Strengthening household financial securityFamily-friendly work policies
Promote social norms that protect against violence and adversity	<ul style="list-style-type: none">Public education campaignsLegislative approaches to reduce corporal punishmentBystander approachesMen and boys as allies in prevention
Ensure a strong start for children	<ul style="list-style-type: none">Early childhood home visitationHigh-quality child carePreschool enrichment with family engagement
Teach skills	<ul style="list-style-type: none">Social-emotional learningSafe dating and healthy relationship skill programsParenting skills and family relationship approaches
Connect youth to caring adults and activities	<ul style="list-style-type: none">Mentoring programsAfter-school programs
Intervene to lessen immediate and long-term harms	<ul style="list-style-type: none">Enhanced primary careVictim-centered servicesTreatment to lessen the harms of ACEsTreatment to prevent problem behavior and future involvement in violenceFamily-centered treatment for substance use disorders

Figure 7. Strategies suggested by the CDC to prevent ACEs [Centers for Disease Control and Prevention (2019). *Preventing Adverse Childhood Experiences: Leveraging the Best Available Evidence*]

References

- Centers for Disease Control and Prevention, *Preventing Adverse Childhood Experiences: Leveraging the Best Available Evidence*. National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, 2019. Atlanta, GA.
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- Bucci, M., et al., *Toxic Stress in Children and Adolescents*. Adv Pediatr, 2016. 63(1): p. 403-28.

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