# Examining the influence of positive childhood experiences on childhood overweight and obesity

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## BACKGROUND

### Overweight and Obesity in Children

- Nearly 32% of children ages 2 to 19 in the United States were either overweight or obese.[1]
- The prevalence of obesity in children is estimated at 17% with higher prevalence rates among racial-ethnic minorities and low-income households.[1]
- Multiple disparities exist across groups:
  - Higher rates of overweight or obesity among non-Hispanic Black children compared to non-Hispanic White children [1]
  - Overweight or obesity prevalence is lower among children living in the highest income group [1]

### Positive Childhood Experiences (PCEs)

- PCEs are essential experiences that engage the child and parents and foster overall wellness and healthy development [2]
  - Safe, stable, nurturing environment
  - Constructive social engagement opportunities
  - Social-emotional competencies
- PCEs have been demonstrated to be protective against overweight or obesity [3, 4]
  - Community and neighborhood level factors can influence the ability to engage in healthy behaviors [5]

There has been limited research examining the association between PCEs and obesity. Further research is necessary regarding this association and whether certain types of PCEs are associated with overweight status or obesity.

## RESEARCH QUESTION

Are positive childhood experiences associated **with lower rates of overweight status and obesity** in children and adolescents?

## METHODS

### National Survey of Children's Health

- Data was drawn from the 2018-2019 National Survey of Children's Health (NSCH) which is a nationally representative mail-in and online survey of parents or caregivers residing in households with at least one child between the ages of 0-17.

### Measures

BMI Classification

- BMI is calculated based on parents' recollection of the child's height and weight and is sorted for age and gender into the following categories:

**Underweight**
- Less than the 5th percentile

**Healthy Weight**
- 5th percentile to less than the 85th percentile

**Overweight**
- 85th to less than 95th percentile

**Obese**
- Equal to or greater than the 95th percentile

Positive Childhood Experiences

- Seven questions on the NSCH were chosen to assess PCEs.[6] These questions were then sorted following previous research[2, 6] into four broad categories:[2]

1. Being in nurturing, supportive relationships
2. Living, developing, playing, and learning in safe, stable, protective, and equitable environments
3. Having opportunities for constructive social engagement and to develop a sense of connectedness
4. Learning social and emotional competencies

### Analytic Methods

- Descriptive statistics and bivariate analyses used to calculate frequencies, proportions, and unadjusted associations for each variable
- P-values **<0.05** were deemed statistically significant
- Multivariable regression models were used to examine the association between obesity and PCEs. Appropriate survey sampling weights, cluster, and strata used by the NSCH were included in analyses to ensure accurate model estimates.
- Analyses were conducted using the statistical software SAS.

## STUDY SAMPLE

### Participant Selection

- Participants with a known BMI and complete ACE, PCE, and demographic information were included in the sample
- The NSCH suppresses weight for children under the age of 10, further delimiting the sample to children ages 10-17

59,963 • 2018-19 NSCH respondents

30,428 • Children with known BMI

28,771 • Complete ACE, PCE, and demographic data

**Characteristics of child**
- 37.8% 10-12 years old
- 50.9% male
- 51.1% non-Hispanic white
- 24.6% special health care needs

**Characteristics of Parent/Household**
- 61.0% child's mother
- 70.3% some college
- 63.4% two parents, currently married
- 17.6% below federal poverty level
- 60.3% private health insurance

### BMI of Respondents

3 out of every 10 children in the sample population were **overweight or obese**

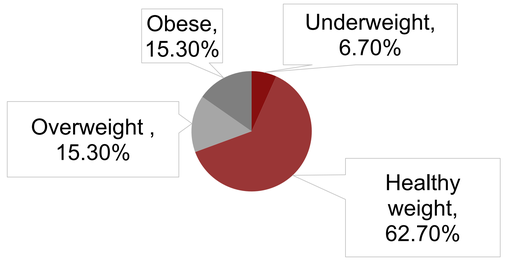



**Figure 1:** BMI of children in sample population, 2018-19 National Survey of Children's Health, Children ages 10-17 (n=28,771)

## RESULTS

### Bivariate Analyses

- Among children reported to be **overweight or obese**:
  - 43.6% were non-Hispanic White
  - 17.6% were non-Hispanic Black
  - 31.3% were Hispanic
- Nearly **a quarter** of children who were overweight or obese lived below the federal poverty line (22.6%)
- Nearly **a third** (32.5%) of children who were reported to be overweight or obese had experienced two or more ACEs
  - **22.2%** of healthy weight children had experienced two or more ACEs

### Positive Childhood Experiences by BMI Category

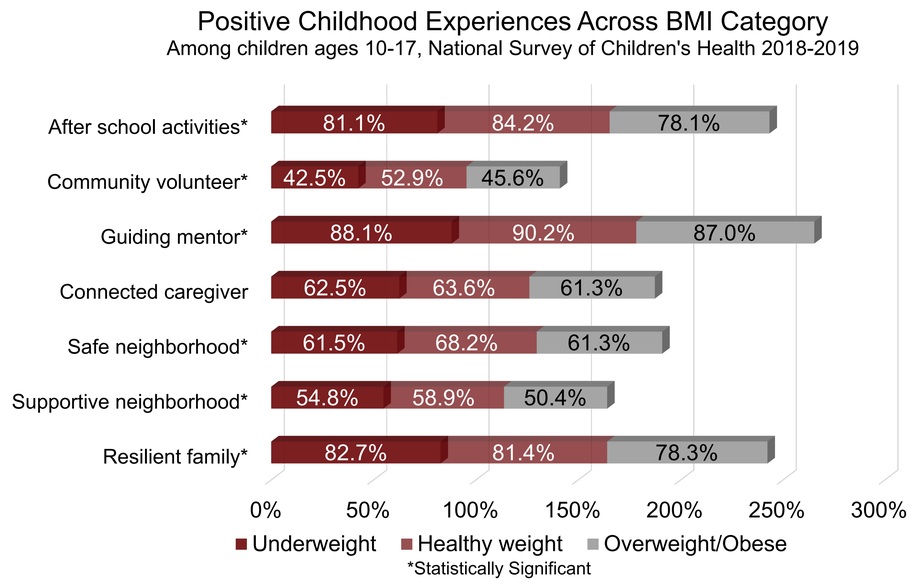



**Figure 2:** Positive Childhood Experiences across BMI categories among children ages 10-17, National Survey of Children's Health, Stratified by BMI

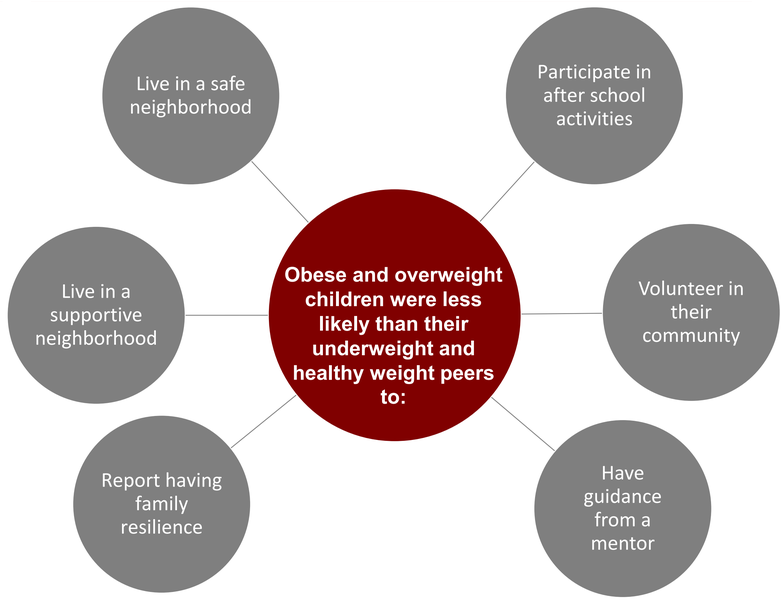
### Multivariable Analyses

In an adjusted analysis, several covariates were significant among children who were exposed to **two or more ACEs**:

Greater odds of being overweight or obese:

- **Non-Hispanic Black children and Hispanic children**, compared to non-Hispanic White children
- **Males** compared to females
- Children **ages 13 to 15 years** compared to ages 10 to 12 years
- Children with **special healthcare needs** compared to children without special healthcare needs
- Children whose **caregiver had a high school education or less** compared to children whose caregiver had some college or more
- Children with **public health insurance** compared to children with private health insurance
- Children **residing below the federal poverty line** compared to children living at or above 400% the federal poverty level

## DISCUSSION




**How could PCEs be protective?**
- A constellation of factors may influence why the majority of PCEs were significantly associated with a reduced incidence of a child being overweight or obese in the unadjusted analyses.

**Community Factors**
- Opportunities for positive childhood experiences is determined by the neighborhoods, communities, and schools in which children live

Living in a supportive neighborhood was associated with decreased likelihood of overweight or obesity status in children [7]

Neighborhood-focused initiatives may be particularly important for program developers and policymakers as they develop interventions [7]

Community building initiatives are one mechanism that help develop supportive environments for children [8]

**Moving Forward**
- The findings from this study have important public health implications as the emotional and behavioral context in which a child develops may be important for prevention efforts for childhood overweight or obesity status
- Thorough examination of both PCEs and ACEs provides policy makers, program developers, and other stakeholders with the opportunity to determine needs of children across the country and where to target interventions.
- It is important to further the understanding of PCEs and ACEs to bring individuals, families, and communities together to address childhood adversity and make use of existing family and community-level assets.

| Strengths | Limitations |
|---|---|
| • Use of a nationally representative database<br>• Used most recent NSCH data<br>• Supplies relevant findings for policy development and implementation | • Parents may overstate socially desirable PCE events<br>• BMI calculated using the child's age and parent reported height and weight<br>• NSCH selects households based on an address-based sampling system and does not include children who are homeless, undocumented, transient, or living in foster care families |

## REFERENCES

1. Ogden CL. Prevalence of obesity among youths by household income and education level of head of household—United States 2011–2014. MMWR Morb Mortal Wkly Rep. 2018;67(6):186-189.
2. Sege RD, Browne CH. Responding to ACEs with HOPE: Health outcomes from positive experiences. Acad Pediatr. 2017; 17(7), S79-S85
3. Borrell, L. N., Graham, L., & Joseph, S. P. (2016). Associations of neighborhood safety and neighborhood support with overweight and obesity in US children and adolescents. Ethnicity & Disease, 26(4), 469.
4. Lynch, B. A., Rutten, L. J. F., Wilson, P. M., Kumar, S., Phelan, S., Jacobson, R. M., ... & Agunwamba, A. (2018). The impact of positive contextual factors on the association between adverse family experiences and obesity in a National Survey of Children. Preventive medicine, 116, 81-86.
5. Saelens, B. E., Sallis, J. F., Frank, L. D., Couch, S. C., Zhou, C., Colburn, T., ... & Glanz, K. (2012). Obesogenic neighborhood environments, child and parent obesity: the Neighborhood Impact on Kids study. American journal of preventive medicine, 42(5), e57-e64.
6. Crouch, E., Radcliff, E., Merrell, M. A., & Bennett, K. J. (2020). Rural-Urban Differences in Positive Childhood Experiences Across a National Sample. The Journal of Rural Health.
7. Singh G, Siahpush M, Kogan M. Neighborhood socioeconomic conditions, built environments, and childhood obesity. Health affairs (Project Hope). 2010;29(3):503-512. doi:10.1377/HLTHAFF.2009.0730
8. Chilton M, Chyatte M, Breaux J. The negative effects of poverty & food insecurity on child development. Indian Journal of Medical Research. 2007;126(4):262-272.

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