Adverse Childhood Experience (ACE), Mental Health, and Childhood Obesity: A Moderated Mediation Model of Neighborhood Built Environment (NBE)*

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Abstract

Objectives. Obesity is a serious public health concern affecting an increasing number of children and adolescents in the U.S. It has been suggested that adverse childhood experience (ACE) (i.e., domestic violence, parental divorce) could worsen mental health among children, in turn leading to weakened coping skills and eventual obesity. It is unclear, however, how mental health mediates the relationship between ACE and childhood obesity and how neighborhood built environment (NBE) might moderate the effects of ACE on developing mental health problems.

Methods. Data were analyzed using a sample of 42,193 children aged 10 to 17 (mean age=13.7±2.3) years from the 2011-2012 National Survey of Children’s Health. Using the structural equation modeling (SEM), the current study applies the moderated mediation model to examine moderating effects of NBE on the associations of ACE with mental health problems.

Results. Approximately 3 out of 10 children were overweight or obese. More than half of these children had at least one ACE, and about 15% suffered from depression, anxiety, or behavioral problems. SEM model displayed a significant mediating effect of mental health between experiencing ACE and body mass index (BMI) (p<0.001). Additionally, as a significant moderator, NBE weakened the negative effects of ACE on mental health problems that may lead to childhood obesity (p<0.001).

Discussion. Identifying and developing social support mechanisms can improve mental health and obesity risk among children with ACE.

Key words: Childhood obesity, Adverse childhood experience (ACE), Social support, Neighborhood built environment (NBE), Mental health

Background

• Obesity severely affects our children.
  • Childhood obesity is defined as a BMI ≥ the 95th percentile (CDC).
  • Childhood obesity rates in the U.S. have tripled over the past 3 decades: 10.6% (obese); 14.8% overweight (NCHS, 2013).
  • Children’s PA & Diet are affected by parents.
  • Parental modeling relates to child’s diets (Fisher, 2002).
  • Nearly 7.5 million children had a parent either incarcerated or on probation or parole (Koertger, 2012).
  • NBE could weaken the deleterious effect of ACE on mental health and ACE on obesity.
  • Buffering Model suggests that social support networks can impact the psychological, physical and social well-being of individuals by changing the way a person perceives and reacts to stress (Bowlby, 1971).

• 28.9% were overweight or obese.
• 50.4% had at least one ACE.
• 35.8% had a 20-min PA 3 days per week.
• 15% suffered from anxiety, depression, etc. (MHP).
• Number of MHP was a significant mediator.
• NBE potentially weakened effects of ACE on MHP.

Methods

• Data used in this analysis were collected as part of the 2011-2012 National Survey of Children’s Health (NSCH).
• Study sample included children aged 10 through 17 (n=42,193).
• Adverse childhood experience (ACE); mental health problems (MHP); neighborhood built environment (NBE).
• Physical activity (PA) was measured as minutes/week.
• BMI was defined as weight in kilograms divided by the square of height in meters.
• SEM was estimated using Stata, version 14/MP.
• Sample weights were further included to the best model (Model D) to test the sensitivity of sample weights to parameter estimates and inferences.

Results

Table 2. Distribution of body mass index by respondent characteristics

Conclusions

• A more holistic approach is needed to deal with childhood obesity problems especially among children with ACE.
• The holistic approach will include: 1) identifying social supports (neighborhood built environment); 2) promoting school PA education; and 3) improving mental health.
• Policymakers should invest resources to equip a community with an anti-obsesogenic environment (e.g., sidewalks, walking paths, recreational parks, community centers, libraries).
• Childhood obesity should be understood using Social Ecological Model as well as Social Cognitive Theory.

Next Step

• We will conduct key informant interviews and parental surveys to identify local NBE and social support systems to help children with ACE improve their PA, mental health, and weight status.

Study Limitations

• We need to further investigate a sampling weighted model (as shown below) using M-plus or other SEM software.

Sampling Weighted Model