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The impact of adverse childhood experiences on obesity and unhealthy weight control behaviors among adolescents

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Abstract

Background: Childhood abuse and other early-life stressors associate with being overweight or obese later in life. In addition to being overweight, unhealthy weight control behaviors (e.g., vomiting, using diet pills, fasting, and skipping meals) have been shown to be common among adolescents. To our knowledge, the association between these behaviors and adverse childhood experiences (ACEs) remains unexamined.

Methods: We examined the association of ACEs to body mass index (BMI) and unhealthy weight control behaviors among 449 Finnish adolescents aged 12 to 17 years admitted to an acute psychiatric hospital unit between April 2001 and March 2006. We used the Schedule for Affective Disorders and Schizophrenia for School-Age Children Present and Lifetime (K-SADS-PL) and the European Addiction Severity Index (EuropASI) to obtain information about ACEs, psychiatric diagnoses and weight control behaviors. BMI was calculated using the weight and height measured for each adolescent upon admission.

Results: Girls who experienced sexual abuse were more likely to be obese (OR: 2.6; 95% CI: 1.1–6.4) and demonstrate extreme weight loss behaviors (EWLB) (OR: 2.2; 95% CI: 1.0–4.7). Among girls, parental unemployment is associated with an increased likelihood of obesity (OR: 3.5; 95% CI: 1.2–9.6) and of being underweight (OR: 3.6; 95% CI: 1.1–11.6). A proneness for excessively exercising was found among girls who had witnessed domestic violence (OR: 3.5; 95% CI: 1.4–9.2) and whose parent(s) had died (OR: 5.4; 95% CI: 1.1–27.7).

Conclusion: This study showed that female adolescents with a history of traumatic experiences or difficult family circumstances exhibited an elevated likelihood of being obese and engaging in unhealthy weight control behaviors.

1. Introduction

Several studies have documented an association between childhood traumatic events and the development of obesity later in life [1–4]. A study from the United States found that, among a sample of adult patients seeking surgical treatment for obesity, approximately one-fifth had been exposed to sexual and physical abuse and over one-third had witnessed violence [3]. In addition, less severe forms of early-life stressors, such as separation from a mother or father or parental marital problems, were associated with an increased risk of obesity in adulthood [1].

However, only few studies have examined the influence of ACEs on being overweight or obese during adolescence [5–8]. A cross-sectional survey of secondary school students aged 13 to 16 years in the Netherlands indicated that, among boys, a history of physical abuse increased their risk for obesity by 1.8 times, while a history of sexual abuse increased their risk by 2.5 times [8]. Another study from the United States showed that cumulative ACEs doubled the risk of being overweight or obese in a pediatric population compared to children free from ACEs [6]. Emotional, sexual, and physical abuses, as well as household dysfunction such as parental alcohol or drug abuse, mental illness, and divorce, frequently fall under the term adverse childhood experiences (ACEs) [9–12].

Previous studies have established a connection between various forms of childhood abuse and excess weight or obesity [2,13,14]. Unhealthy weight control behaviors, such as vomiting, use of diet pills, fasting, and skipping meals are

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common among adolescents [15,16]. To our knowledge, the association between these behaviors and ACEs remains unstudied in adolescent populations. Therefore, this study aimed to examine the association and cumulative effect of various ACEs on becoming overweight or obese, and to determine the relation of engaging in unhealthy weight control behaviors in a clinical sample of 12 to 17 year old inpatients in Northern Finland.

2. Materials and methods

2.1. Study sample

This study represents a portion of the Study-70 project, described in detail elsewhere [17,18]. The original study sample consisted of 508 (300 girls and 208 boys) adolescent psychiatric inpatients aged 12 to 17 years (mean, 15.4 years) consecutively admitted for acute psychiatric hospitalization to unit 70 at Oulu University Hospital between April 2001 and March 2006. From these 508 adolescents, data on weight or height were absent for 59 individuals. Thus, our final study sample was 449 patients (271 girls and 178 boys). We found no difference based on age, sex, or place of residence between the 59 individuals for whom data on height or weight were missing and the final study sample. No differences existed in the prevalence of a fear of becoming obese, exercising excessively, extreme weight loss behaviors (EWLB), or binge eating in a comparison of the final study sample to those excluded from the analyses. The Ethics Committee of the University of Oulu, Finland approved the study protocol.

2.2. Instruments

The treating physicians or trained medical students interviewed adolescents during their hospitalization using the semi-structured Schedule for Affective Disorder and Schizophrenia for School-Age Children Present and Lifetime (K-SADS-PL) (Kaufman et al. 1997) to determine the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) diagnoses, and to identify unhealthy weight control behaviors. Using the K-SADS-PL interview, the test–retest reliability of diagnoses was rated as good to excellent, and the inter-rater agreement and concurrent validity were both high [19,20]. The data for the present study were collected using K-SADS-PL, with the exception of place of residence, information about parental divorce, death, and employment status, and any psychiatric and substance-related problems. This additional information was obtained from interviews using the European Addiction Severity Index (EuropASI) [21] and conducted by trained nurses on unit 70. EuropASI is a face-to-face structured interview shown to yield highly satisfactory results in terms of its reliability and validity when applied to substance-abusing populations [21].

2.3. ACE variables

Information on domestic violence and exposure to sexual or physical abuse was based on the screening section for post-traumatic stress disorder (PTSD) within the K-SADS-PL interview. Adolescents were asked whether they had witnessed domestic violence (the child witnessed explosive arguments involving threatened or actual harm to a parent; yes or no), experienced physical abuse from a parent(s) (bruises sustained on more than one occasion or had sustained a more serious injury; yes or no), or had experienced any form of sexual abuse (isolated or repeated incidents of genital fondling, oral sex, or vaginal or anal intercourse; yes or no).

Information regarding the employment status of a patient's mother and father was gathered during the EuropASI interview (a mother or father was defined as being employed if s/he held a regular full- or part-time job). Data on psychiatric and substance use problems among the patient's mother or father were also obtained using EuropASI. Adolescents were asked if they felt that their mother or father had any substance abuse (alcohol, drugs, or other substances; yes or no) or psychiatric problems (yes or no) requiring treatment or if they felt their parent(s) should be treated by health professionals. Information on parental divorce (including marriage and cohabitation) and parental death (yes or no) was also obtained using the EuropASI interview.

2.4. Body mass index (BMI)

Body mass index (BMI; calculated as weight in kilograms divided by height in meters squared) was calculated using the weight and height for each adolescent measured by a nurse upon admission to the psychiatric ward. An adolescent was defined as normal weight if her/his BMI fell between the 25th and 85th percentiles of the age- and sex-matched Finnish population. An adolescent with a BMI under the 25th percentile was defined as underweight, an adolescent with a BMI falling between the 85th and 95th percentiles was identified as overweight, and an adolescent with a BMI falling above the 95th percentile was identified as obese. The cut-off points were determined according to the BMI percentile values based on standard BMI reference data used in Finnish child health clinics [22].

2.5. Fear of becoming obese

Information about any fear of becoming obese was based on the screening section for anorexia nervosa within the K-SADS-PL interview. Adolescents were asked whether they had ever been afraid of becoming obese and how serious this fear was. Responses fell into the following categories: (1) no information; (2) not present; (3) sub-threshold, indicated by an intense and persistent fear of becoming fat that defies prior weight history and/or present weight, where fears only moderately impact on behavior and/