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Original article

Early Predictors of Eating Problems in Preadolescence— A Prospective Birth Cohort Study



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A B S T R A C T

Purpose: The epidemiology of childhood eating problems is far from being fully described. The present study aims to explore early predictors of eating behavior problems in preadolescence.

Methods: The study sample comprised 1,939 children from the birth cohort study, the Copenhagen Child Cohort (CCC2000). Logistic regression models were used to investigate associations among infancy health, developmental and relational factors, maternal mental health problems, socio-economic factors, parental reported eating behavior patterns in preschool age and eating behavior problems in preadolescence.

Results: A number of factors expressing socioeconomic disadvantage across childhood were associated with an increased risk of eating behavior problems at age 11–12 years. In addition, overeating patterns at age 5–7 years predicted restrained eating in preadolescence (odds ratio [OR] = 2.77; 95% confidence interval [CI] = 1.13–6.77; $p = .03$), with overweight at age 11–12 years and low annual household income as strong explanatory factors (OR = 4.79; 95% CI = 2.81–8.17; $p < .0001$ and OR = 2.06; 95% CI = 1.19–3.58; $p = .02$, respectively). No significant associations between perinatal, early child- and relational factors, or maternal mental disorder and eating behavior problems in preadolescence were found.

Conclusions: Our results suggest that overeating at age 5–7 years is prospectively associated with restrained eating in preadolescence, with contemporaneous socioeconomic disadvantages and overweight as strong explanatory factors. Our findings might reflect successful public health interventions toward childhood obesity or might reflect a developmental course of problematic eating fluctuating between over- and undereating. Future studies should focus on the possible pathways from overeating to restrained eating and more severe eating pathology, including possible negative side effects of otherwise successful interventions aimed at reducing childhood obesity.

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IMPLICATIONS AND CONTRIBUTION

Overeating patterns at age 5–7 years are prospectively associated with restrained eating in preadolescence, with socioeconomic disadvantage and overweight as strong explanatory factors. This might reflect successful public health interventions toward childhood obesity or might reflect a developmental course of problematic eating fluctuating between over- and undereating tendencies.

Conflicts of Interest: The authors have indicated they have no financial relationships relevant to this article to disclose.

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The epidemiology of childhood eating problems is far from being fully described, and specific research addressing eating behaviors in preadolescence is currently limited. A range of eating behavior problems has been described in preadolescence [1]; however, knowledge of the development and course of these problems are not well understood [2]. Because eating pathology most commonly emerges in adolescence [3], the preadolescent years may be a particular key-development period of interest in relation to the development of eating behavior problems [4]. Existing literature points to a multifactorial nature of childhood eating problems based on the interaction of developmental, environmental, and social factors [1,5]. Factors such as preterm birth and low birth weight [5,6], early regulatory problems [7], disturbed mother–infant relationship [8,9], and maternal psychopathology [10] have all been suggested to have a role in the etiological mechanisms of early and middle childhood eating problems. However, few studies have investigated early developmental markers of eating problems in late childhood and early adolescence. McDermott et al. [11] found infancy problems of feeding and sleeping, high maternal age, and maternal anxiety to be associated with the persistence of irregular eating between ages 6 months and 14 years in a large population-based sample (N = 4,554). Hafstad et al. [12] found sleeping problems in early childhood predictive of eating problems in 16-year-olds (N = 373), and Le Grange et al. [13] recently found that early gestational age, persistent temperamental difficulties, and high weight increased the vulnerability for eating behavior problems in a large sample of 15- to 16-year-olds (N = 1,300). A number of socioeconomic factors have also been related to childhood eating behavior problems [14], and Cameron et al. [15] found maternal age, parental education, and income showing a strong negatively socioeconomic gradient in eating behaviors.

In spite of growing literature in the field of childhood eating problems, there has been a call for well-designed longitudinal studies [2]. Most prospective studies in the field have been small, covering short-term follow-up periods or mainly clinical studies. The present study was a part of a large birth cohort study aimed to explore early predictors of eating behavior problems in preadolescence. We investigated early child factors and parentally perceived eating behavior patterns at age 5–7 years as possible predictors of self-reported eating behavior problems at age 11–12 years. We hypothesized that early regulatory and relational problems, maternal psychopathology, and socioeconomic disadvantages in early childhood would be differentially associated with eating behavior problems in preadolescence. In addition, we hypothesized that certain eating behavior patterns (i.e., overeating and picky eating) in early childhood would precede eating behavior problems at age 11–12 years.

Methods

Study population

The Copenhagen Child Cohort (CCC2000) study is a large general-population birth cohort study designed to investigate determinants and early signs of psychopathology [16]. It comprises all 6,090 children born in the year 2000 in the former County of Copenhagen, Denmark [16]. The cohort has been followed prospectively since birth and the present study included data from the following three waves of data collection:

(1) baseline data (0–1 year); (2) 5–7 years; and (3) 11–12 years. An overview of the data collection is given in [Figure 1](#).

Procedure

The present study was part of the 11- to 12-year follow-up of the CCC2000 conducted from May 1, 2011 to October 1, 2012. The children in the cohort were traced through the Danish Central Civil Registration System [17,18], the system in Denmark where all citizens are registered with a personal identification number (Civil Registration number). A total of 4,847 children were identified at age 11–12 years, whereas 1,243 children were lost to follow-up (993 had claimed research protection, an option used in Denmark when citizens do not want to receive requests for statistical and scientific studies; 14 children were not traceable; 19 had deceased; and 217 had emigrated). The children and their parents were invited by letter to participate in the 11- to 12-year follow-up by completing Web-based questionnaires. Of the eligible children (N = 4,847) at age 11–12 years, data on child-reported eating behaviors were obtained on 1,939 (40.0%) children.

Measures

Data from first year of life. Baseline variables included data systematically collected by community health nurses during the first year of life. Data from health nurse assessments were collected using standardized records as part of four routine home visits conducted during the first 10 months: (1) first visit (1–5 weeks); (2) second visit (2–3 months); (3) third visit (4–6 months); and (4) fourth visit (8–10 months). At each visit, the health nurse measured length and weight, assessed a variety of health-related items, and concluded whether the development was normal or abnormal according to age. The variables used in the present study are presented in [Table 1](#).

Eating behaviors at age 5–7 years. At age 5–7 years, eating behavioral patterns were assessed using the Childhood Eating Assessment Questionnaire [19]. The Childhood Eating Assessment Questionnaire is a 41-item parent-report questionnaire derived from the Child Eating Behaviour Questionnaire, the Childhood Eating Behaviour Inventory, and questions from the Stanford Feeding Questionnaire. Micali et al. [19] identified five eating behavioral patterns differentially associated with impact and psychopathology at age 5–7 years: (1) overeating/good appetite; (2) picky eating; (3) slow/poor eating; (4) delayed eating; and (5) snacking. Data on eating behaviors at age 5–7 years were available on 825 (42.5%) of the participating children at age 11–12 years (N = 1,939). Due to low frequency, delayed (N = 1/825) and slow/poor eating (N = 6/825) were not included in the present study.

Height and weight measurements at age 11–12 years. Body mass index (BMI) was calculated based on objective measurements of height and weight at the 11- to 12-year follow-up as previously described [20]. The children were classified into BMI categories of underweight, normal weight, or overweight/obese using the age and gender-specific BMI cutoffs provided by the International Obesity Task Force [21,22].

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