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The association of adverse life events with children's emotional overeating and restrained eating in a population-based cohort

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Abstract

Objective: Life adversities are recognized risk factors for eating disorders, in adolescents and adults, but whether such adversities are also associated with particular eating behaviors earlier in life is still unclear. Our aim was to assess whether experiencing adverse life events in early childhood is associated with emotional overeating and restrained eating at age 10.

Methods: Emotional overeating and restrained eating were assessed in 4,653 10-years-old children using the mother-reported Children's Eating Behavior Questionnaire and Dutch Eating Behavior Questionnaire. Mothers also reported on 24 different life events during childhood, those with moderate or severe impact being categorized as adverse life events. Regression analyses were performed to investigate relationships between adverse life events and eating behaviors in the total sample.

Results: Adjusted for covariates, adverse life events were associated with more emotional overeating and restrained eating in children (p-values for trend <.01). Specifically, mothers who reported that their child experienced 3+ adverse life events, also reported significantly higher emotional overeating (B = 0.20; 95% confidence interval [CI], 0.06–0.33) and restrained eating (B = 0.21; 95% CI, 0.08–0.33) in their children relative to children who did not experience adverse life events. These results did not differ by sex.

Discussion: Our results based on mother-reported data suggest that children's experiences of life adversities are associated with emotional overeating and restrained eating at age 10 years. We recommend future prospective studies using multi-informant assessments of both adverse life events and eating behaviors to further describe the nature and developmental course of this relationship.

KEYWORDS

adverse childhood experiences, child behavior, cohort studies, emotional regulation, feeding and eating disorders, feeding and eating disorders of children, psychological distress

1 | INTRODUCTION

Emotional overeating and restrained eating are common behaviors in our modern society. Emotional overeating refers to the tendency to eat in response to negative affect (Lindeman & Stark, 2001; Van Strien, Schippers, & Cox, 1995), while restrained eating is characterized by restrictive behaviors, such as eating less than desired, in order to maintain body weight (Goossens, Braet, Van Vlierberghe, & Mels, 2009; Tanofsky-Kraff et al., 2007; Van Strien, Frijters, Roosen, Knuiman-Hijl, & Defares, 1985). While exhibiting some levels of these behavioral tendencies may not be harmful, emotional overeating and restrained eating have been associated with the development of overweight (Geliebter & Aversa, 2003; van Strien, 2018). Moreover, previous research showed that emotional overeating and restrained eating often co-occur with body dissatisfaction and may eventually evolve into more extreme dieting or inappropriate methods of compensation, suggesting that they might be early precursors of or risk factors for Anorexia nervosa (AN), Bulimia nervosa (BN), and binge-eating disorder (BED; Dakanalis et al., 2014; Eldredge & Agras, 1996; Garfinkel, 2002; Goossens et al., 2009; A. J. Hill, 1993; van Strien & Oosterveld, 2008; Waller & Osman, 1998). Although eating disorders are mostly diagnosed in late adolescence or early adulthood, emotional overeating and restrained eating usually develop earlier, from middle childhood onwards (Stice, Marti, Shaw, & Jaconis, 2009). It is important to understand which factors may be involved in the development of these behaviors in children and adolescents (Flament et al., 2015; Swanson, Crow, Le Grange, Swendsen, & Merikangas, 2011), and therefore, the present study examines the association of adverse life events with emotional overeating and restrained eating in childhood.

The experience of adverse life events has been associated with the development of a range of mental and physical problems, including depression, substance use, asthma, heart disease, and obesity (Danese & Tan, 2014; Kessler et al., 2010; Pegington, French, & Harvie, 2020; Scott et al., 2011). Research on eating disorders has also implicated a link between adverse life events and AN, BN, and BED (Degortes et al., 2014; Loth, van den Berg, Eisenberg, & Neumark-Sztainer, 2008; Michopoulos et al., 2015; Schmidt, Tiller, Blanchard, Andrews, & Treasure, 1997; Welch, Doll, & Fairburn, 1997). Most of these studies focused on extremely severe adversities, including maltreatment (Fairburn, Welch, Doll, Davies, & O'Connor, 1997), sexual abuse (Connors & Morse, 1993; Madowitz, Matheson, & Liang, 2015), emotional abuse (Kent, Waller, & Dagnan, 1999; Rorty, Yager, & Rossotto, 1995), and loss of or separation from loved ones (Smyth, Heron, Wonderlich, Crosby, & Thompson, 2008). These studies showed consistent correlations between adverse life events and clinical eating disorders, although it remains unclear whether adverse events in childhood are true risk factors for the development of eating disorders, due to the paucity of required prospective studies and the potential selection bias inherent to assessing relationships in clinical samples (Afifi et al., 2017).

In contrast to these studies on eating disorders, relatively little research exists on the link between adverse life events and eating behaviors (e.g., emotional overeating, restrained eating) in childhood and early adolescence. As suggested above, knowledge about predictors of emotional overeating and restrained eating might help to better understand their development and origins. Moreover, knowledge about early precursors and severity indicators of eating disorder symptoms is needed, as this may inform early intervention strategies (Afifi et al., 2017; Molendijk, Hoek, Brewerton, & Elzinga, 2017). In fact, Molendijk et al. (2017) described that, from a clinical perspective, it is highly relevant to elucidate to what extent adverse life events affect the defining features of eating disorders, including severity of behavioral and cognitive symptoms (dose–response), and age of onset or appearance of first symptoms. Yet, the few existing studies on adverse life events and emotional overeating in childhood have produced inconsistent findings, with some reporting that exposure to life events was associated with more emotional overeating (Bjørklund, Wichstrøm, Llewellyn, & Steinsbekk, 2019; Michels et al., 2012), and some finding no association (Michels et al., 2015). To our knowledge, the relationship between adverse life events and restrained eating in childhood has not been examined before. Nevertheless, considering that affect regulation problems represent one of the mechanisms through which adverse life events may influence mental health, it seems plausible that these events also affect eating behaviors. Models based on psychodynamic and developmental perspectives suggest that eating disorders—and their various symptoms—might be considered as an impairment in the cognitive capacity to process and regulate emotions (Taylor & Altman, 1997). Restricted food consumption, binge eating (as an extreme form of emotional overeating), and compensatory behaviors can be interpreted as responses to regulate intense emotional states, as a way to restrict affective experiences (Clinton, 2006; Torres et al., 2011) or as a strategy to deviate attention away from negative emotions by focusing on the body and eating (Overton, Selway, Strongman, & Houston, 2005; Torres et al., 2011). Coping strategies, and behavioral and physical responses to stress differ by sex, with girls reporting internalizing problems (rumination, negative self-evaluation) while boys become more disinhibited (delinquency, substance use) (Galaif, Sussman, Chou, & Wills, 2003; Hankin, Mermelstein, & Roesch, 2007) and also seem to have a blunted cortisol response (Daughters, Gorka, Matusiewicz, & Anderson, 2013). Whether sex differences exist in the relation between adverse life events and eating behaviors is mostly unknown, given that most clinical studies included girls and young women only.

The aim of this study was to assess the association of exposure to adverse life events during childhood with restrained eating and emotional overeating at the age of 10 years. For this, we used data from a population-based cohort in the Netherlands with maternal reports on adverse life events and eating behaviors of children. We hypothesized that adverse life events are associated with higher levels of emotional overeating and restrained eating, reflecting a dose dependent association with a higher frequency of experienced events being more strongly associated with emotional overeating and restrained eating. Furthermore, in line with previous studies (Almuneef, ElChoueiry, Saleheen, & Al-Eissa, 2017; Coêlho et al., 2018), we expected to find stronger life event—eating behavior associations

in girls than in boys, as boys may be exposed to fewer adversities than girls and may also respond differently to stress than girls.

2 | METHODS

2.1 | Study population

This study was embedded in Generation R, a prospective population-based cohort designed to identify causes of normal and abnormal development and health from fetal life until young adulthood (Kooijman et al., 2016). In the Netherlands, pregnant women are monitored by midwife practices. Therefore, all midwives working in Rotterdam were asked to inform and invite all pregnant women with an expected delivery date between April 2002 and January 2006 to start participating in Generation R (Jaddoe et al., 2006; Kooijman et al., 2016). Although the participation rate was relatively high (61%), there was some selection towards a relatively highly educated and healthy study population (Center for Research and Statistics, 2005; Jaddoe et al., 2006). Further information about Generation R can be found elsewhere (Kooijman et al., 2016).

2.2 | Sample

Of the original enrolled population (*N* = 9,901), parents of 7,393 children gave full consent for the postnatal follow-up phase at 10 years of age. Those without data on any outcome (emotional overeating or restrained eating scales, *N* = 2,407) or on life events (*N* = 333) were excluded, leaving a sample of 4,653 children for analyses (62.9%).

2.3 | Children's eating behavior

Eating behavior was assessed when children were 10 years old using multiple scales of the Children's Eating Behavior Questionnaire (CEBQ). Considering the purpose of this study, we decided a priori to only use the emotional overeating subscale of the CEBQ (4 items) (Wardle, Guthrie, Sanderson, & Rapoport, 2001). Parents (mostly mothers) rated their children's tendency to overeat when worried, annoyed, anxious, or bored on a 5-point Likert scale (1 = never to 5 = always). The CEBQ has shown good internal consistency, concurrent validity with actual eating behavior, and test–retest reliability (Dubois, Farmer, Girard, Peterson, & Tatone-Tokuda, 2007; Sleddens, Kremers, & Thijs, 2008).

Children's dietary restraint was assessed with the restrained eating scale of the Dutch Eating Behavior Questionnaire (DEBQ)—parent version (Braet & Van Strien, 1997). Parents indicated on the nine items whether the described behaviors occurred in their children, on a 5-point Likert scale from 1 = never to 5 = always. The restrained eating scale has shown high internal consistency, factorial validity, and dimensional stability (van Strien, Frijters, Bergers, & Defares, 1986; van Strien & Oosterveld, 2008). The item regarding eating in the evening was not assessed in Generation R, as we considered this item less relevant for 10-year old children who might generally not eat much after dinner.

In this sample (*N* = 4,653), Cronbach's alpha was .91 for the CEBQ's emotional overeating subscale and .90 for the DEBQ's restrained eating scale, indicating good internal consistency.

2.4 | Adverse life events

When children were on average 10 years old, mothers were interviewed about the occurrence of adverse life events in their offspring's entire childhood. The assessment was based on a previous assessment in a similar cohort (Amone-P'Olak et al., 2009). The interview evaluated 24 different childhood adversities and the perceived impact of the event on the child (none, a little, moderate, a lot). Only the life events that were reported as affecting the child "moderately" or "a lot" were considered as "adverse life events" (Bolhuis et al., 2018). This way, we weighted the life events for their impact considering that not all experienced life events are similarly adverse for different persons. Questions included items on parental divorce/separation, transferring schools, physical or sexual maltreatment, and other events frequently assessed and reported by literature as associated to eating disorders (Amone-P'Olak et al., 2009; Connors & Morse, 1993; Degortes et al., 2014; Fairburn et al., 1997; Garfinkel, 2002; Kent et al., 1999; Loth et al., 2008; Madowitz et al., 2015; Molendijk et al., 2017; Rorty et al., 1995; Schmidt et al., 1997; Smyth et al., 2008; Taylor & Altman, 1997; Welch et al., 1997). Potentially related events (e.g., parental divorce, moving to a new house and changing schools) were considered as separate events. A complete list of the 24 included life events is reported in Table 1, together with their lifetime prevalence in this sample. Because of the right-skewed, non-normal distribution of life events (Table S1) and following previous research (Afifi et al., 2017), a four-level ordinal count variable was created, which indicated the number of adverse life events children had experienced according to their mothers (0, 1, 2, and ≥3). Given the low prevalence of cumulative events combined with the aim to examine gender interactions (dividing the cells into half), this categorization reflected the largest number of categories possible.

2.5 | Covariates

Information about child sex was obtained from midwife and hospital registries. Children were categorized as Dutch, Western, or Non-Western ethnicity based on the country of birth of both parents reported in a postal questionnaire. Maternal education and family income were also assessed by postal questionnaires when enrolled in the study. Maternal and paternal psychopathology during pregnancy was assessed using the Brief Symptom Inventory, a validated 53-item self-report questionnaire assessing a wide variety of psychiatric symptoms (Derogatis, 1983).

TABLE 1 Childhood adverse life events in the study sample (*N* = 4,653)

Adverse life event	Number of events (%)
Did your child get seriously sick or did he/she have an accident?	140 (3.0)
Did a family member get seriously sick or did someone have a serious accident?	146 (3.1)
Did someone else, who is important to the child, get seriously sick or did someone have a serious accident?	189 (4.1)
Has the father/mother or other caretaker of your child died?	18 (0.4)
Has someone else, who your child cared a lot about, passed away?	199 (4.3)
Has a pet, who you child cared a lot about, die?	94 (2.0)
Does or did your child have to deal with a high workload at school?	442 (9.5)
Has your child ever repeated a grade?	44 (0.9)
Are/were there any neighborhood problems? For example, vandalism or insecurity.	81 (1.7)
Has your family financial difficulties or had your family ever have them?	69 (1.5)
Does your child have ongoing conflicts with a family member (or did your child ever have them)?	106 (2.3)
Does your child have ongoing conflicts with someone else (or did your child ever have them)?	130 (2.8)
Do other family member have ongoing conflicts with each other (or did they ever have them)?	155 (3.3)
Are you and your partner divorced or separated?	230 (4.9)
Did one of the parents become involuntarily unemployed?	49 (1.1)
Did your child lose a good friend due to an argument?	38 (0.8)
Did your child ever lose something which was important to him/her? For example, through fire, loss, or theft.	50 (1.1)
Has someone ever used physical violence against your child? For example, beating him/her up.	47 (1.0)
Has someone almost used physical violence against your child? So that not actually happened, but your child was frightened.	71 (1.5)
Has someone made sexual comments or movements towards your child?	21 (0.5)
Has your child experienced inappropriate sexual behavior?	10 (0.2)
Has someone spread mean rumors about your child?	95 (2.0)
Has your child moved to a different place of residence?	53 (1.9)
Has your child changed schools?	64 (1.6)
Other nonspecified.	559 (12.0)

Additionally, mother's history of eating disorders was assessed by a self-report questionnaire using a vignette describing symptoms of AN and BN, followed by questions whether the participant ever had these disorders (de Barse et al., 2015). BED was not included in our study, as this was not an official psychiatric diagnosis at the time of ED assessment (American Psychiatric Association, 2001).

2.6 | Statistical analyses

Descriptive analyses were performed to describe the sample's sociodemographic characteristics. Using a Chi-square test, the distribution of adverse life events by sex was explored.

We estimated missing values on covariates (ranging from 0% missing for sex to 37.0% for father's psychopathology) using multiple imputation techniques (Sterne et al., 2009). All variables included in the analyses were used to estimate the missing values (Graham, 2009). Regressions were conducted on the imputed dataset and reported estimates are the pooled results of 25 imputed datasets. A nonresponse analysis was performed using *t* tests to examine differences in sociodemographic characteristics between study participants and those who were excluded due to missing values on life events or on emotional overeating and/or restrained eating.

We performed linear regression analyses to estimate the association of the number of mother-reported adverse life events during childhood with emotional overeating and restrained eating. Based on previous research, we adjusted models for several potential confounders (see the Covariates section) (Afifi et al., 2017; Cardona Cano et al., 2016; Jansen et al., 2012). The regression analyses were repeated with the ordinal life events variable included as a continuous variable to obtain a *p*-value for trend across the cumulative life events. Subsequently, we tested sex by adverse life events interactions; in case of significant interaction terms, the analyses were stratified by sex. Statistical analyses were performed with SPSS 24.

2.7 | Ethics

The study was conducted in accordance with the guidelines proposed in the World Medical Association Declaration of Helsinki and has been approved by the Medical Ethical Committee of the Erasmus Medical Center Rotterdam. Written informed consent was obtained from all individual participants included in the study.

3 | RESULTS

3.1 | Nonresponse analysis

The characteristics of the participants included in the final sample (*N* = 4,653) and those without any data on the outcome or life events interview (*N* = 2,740) were compared. Data were more often missing in children with a non-Western background and a lower family income (<1,200 € per month), and of whom the mothers had a lower educational level and higher psychopathology scores.

3.2 | Sample characteristics

Child and family characteristics are presented in Table 2. Half of the sample were girls (50.6%), and the majority (65%) is of Dutch origin. Nearly 60% reported a high household income (>2,000 € per month), and 8.9% of the mothers reported a low household income (<1,200 € per month).

TABLE 2 Characteristics of the study population (*N* = 4,653) (N = numerosity)

Child characteristics		N (%)[a]	Mean score (*SD*)[b]
Sex, %	**Girls**	**2,354 (50.6)**	
Ethnicity, %	Dutch	3,024 (65.0)	
	Other western	410 (8.8)	
	Non-western	1,175 (25.3)	
Children's eating behaviors	CEBQ – Emotional Overeating mean item score	4,518	1.51 (0.67)
	DEBQ – Restrained Eating mean item score	4,630	1.40 (0.57)
Family characteristics			
Maternal educational level, %	Low (none or primary school)	669 (14.4)	
	Medium (middle or high school)	1,305 (28.0)	
	High (university degree)	2,412 (51.8)	
Household income, %	Low (<1,200€ per month)	413 (8.9)	
	Medium (1,200–2,000€ per month)	607 (13.0)	
	High (>2,000€ per month)	2,725 (58.6)	
Psychiatric symptoms during pregnancy (BSI score)	Mother	3,545	0.24 (0.31)
	Partner	2,942	0.13 (0.21)
Lifetime maternal eating disorder, %	No eating disorder	3,214 (69.1)	
	Anorexia nervosa only	74 (1.6)	
	Bulimia nervosa only	143 (3.1)	
	AN and BN	72 (1.5)	

[a]Number of subjects (and relative percentage) represented in each category or that replied to the relative questionnaire. Some variables had missing values: child ethnicity (0.9%), CEBQ score (2.9%), DEBQ score (0.5%), maternal educational level (5.8%), household income (19.5%), maternal and paternal BSI score (23.8 and 36.8%, respectively), and maternal history of eating disorders (24.7%).
[b]Mean score and standard deviation of the relative questionnaires in the analyzed sample.

Seventy-four of the mothers (1.6%) reported a history of AN, 143 (3.1%) a history of BN, and 72 (1.5%) recalled a history of both AN and BN.

3.3 | Descriptive adverse life events and eating behavior

A list of the events assessed in the life events interview is shown in Table 1. A total number of 3,100 life events were reported. Mothers most frequently reported: high school workload (9.5%), parents' separation or divorce (4.9%), death of a cared one other than parents (4.3%), and accident or sickness of the child himself, of a family member or of a cared one (3.0, 3.1, and 4.1%, respectively). Boys and girls experienced comparable numbers of mother-reported adverse life events (Table 3 includes proportion of girls per life events category), as confirmed by a nonsignificant chi-square test. Regarding eating behavior, girls scored higher on both emotional overeating (M = 1.53, *SD* = 0.69) and restrained eating (M = 1.44, *SD* = 0.59) than boys (M = 1.49, *SD* = 0.66; and M = 1.36, *SD* = 0.55, respectively).

TABLE 3 Association between adverse life events and eating behavior in children

	Emotional overeating (z score)		Restrained eating (z score)	
Adverse life events (0–10 years)	**B[a]**	**95% CI**	**B[a]**	**95% CI**
Zero life events (*N* = 3,021, 51.4% girls)	Ref.		Ref.	
One life event (*N* = 878, 48.3% girls)	0.05	[−0.03; 0.14]	0.03	[−0.06; 0.11]
Two life events (*N* = 401, 50.9% girls)	0.06	[−0.05; 0.18]	0.10	[−0.01; 0.22]
Three or more life events (*N* = 353, 48.7% girls)	0.20*	[0.06; 0.33]	0.21*	[0.08; 0.33]
p-value for trend		.003		.001

[a]Adjusted for child sex and ethnicity, household income, maternal education, maternal and paternal psychopathology symptoms during pregnancy and lifetime maternal eating disorders.
*p-value <.05.

3.4 | Childhood adversities and eating behavior

Table 3 displays the results of the regression analyses on the association between number of mother-reported adverse life events and children's emotional overeating and restrained eating. In this adjusted model, subjects who, according to their mothers, experienced three or more adverse life events showed higher scores on emotional overeating and restrained eating (B = 0.20; 95% confidence interval [CI], 0.06–0.33; and B = 0.21; 95% CI, 0.08–0.33, respectively) than those who experienced no adverse life events. Unadjusted results are shown in Table S2.

3.5 | Role of sex

The covariate sex was significantly associated with emotional overeating (B = 0.07; 95% CI, 0.002–0.14) and restrained eating (B = 0.13; 95% CI, 0.04–0.18), with girls scoring higher than boys. Yet, the sex by adverse life events interactions were not significant, suggesting that there are no sex-differences in the relationship between mother-reported adverse life events and both emotional overeating and restrained eating.

4 | DISCUSSION

In this population-based study, we found that the experience of adverse life events during childhood—which had at least moderate impact according to the mothers—is associated with specific eating behaviors among 10-year old children, as reported by the mothers of the children in the sample. Our data showed a consistent graded association, with children exposed to a higher number of adversities displaying both more emotional overeating and more restrained eating. These findings are in line with previous clinical research among adults, which indicated an association between the experience of adverse life events and later eating disorders (Afifi et al., 2017; Degortes et al., 2014; Loth et al., 2008; Michopoulos et al., 2015; Schmidt et al., 1997; Welch et al., 1997). The present findings also support previous research linking the experience of adverse life events with emotional overeating in children (Bjørklund et al., 2019; Michels et al., 2012).

Our study did not evaluate potential mediators, but the observed association of mother-reported adverse life events with children's emotional overeating and restrained eating may be explained by emotion regulation: adverse events might affect children's ability to regulate and cope with negative affect, and some children may turn to emotional overeating as a strategy to regulate affect (Lindeman & Stark, 2001; Polivy, Herman, & McFarlane, 1994; Taylor & Altman, 1997). Restrained eating may also act as a means to gain control over negative emotions (Torres et al., 2011; Waller & Osman, 1998). Another explanation for the reported associations may be stress-regulation: stress resulting from adverse life events may lead to homeostatic changes and perturbations of the hypothalamic–pituitary–adrenal (HPA) axis, which regulates secretion and action of appetite-related hormones like cortisol, ghrelin, leptin and insulin (Chao, Jastreboff, White, Grilo, & Sinha, 2017). While appetite is typically suppressed during acute stress (Charmandari, Tsigos, & Chrousos, 2005), chronic stress usually stimulates desire for high-fat and energy-dense foods (Adam & Epel, 2007). As such, the stress associated with adverse life events may lead to overconsumption of highly palatable foods. Furthermore, even though we thoroughly adjusted for several potential confounding factors, it is possible that our findings are explained by residual confounding. Indeed, several covariates were associated with emotional overeating and restrained eating, and might also explain part of the association. Yet, the covariates included in the models did not fully explain the associations between mothers-reported adverse life events and emotional overeating and restrained eating.

As initially hypothesized, we expected to find stronger associations in girls than in boys. Although, in contrast to this hypothesis—and also contrasting with some previous clinical studies (Almuneef et al., 2017; Coêlho et al., 2018; Galaif et al., 2003; Hankin et al., 2007)—the nonsignificant sex by adverse life event interactions suggested that the association's strength did not differ between boys and girls. Given that this is one of the first studies focusing on the relation of adversities with children's eating behaviors, we strongly recommend future studies to replicate and substantiate our findings.

Generally, future prospective research on this topic is needed to improve strategies for the prevention of the development of less desirable eating behaviors. For instance, such strategies could be focused on preventing childhood adversities by altering the context in which individuals grow up (Mendenhall, Kohrt, Norris, Ndetei, & Prabhakaran, 2017), or to promptly recognize and intervene when a child has experienced a potentially stressful adverse life event. Unfortunately, there is still scarce evidence about the effectiveness of programs that are focused on preventing childhood adversities.

4.1 | Strengths and limitations of the study

The current study was strengthened by its population-based design and the large number of participants followed into late childhood. Furthermore, the assessed CEBQ and DEBQ questionnaires are widely used and well-validated tools for the assessment of eating behaviors (Sleddens et al., 2008; van Strien et al., 1986; van Strien & Oosterveld, 2008; Wardle et al., 2001) and also showed a good consistency in this sample.

However, this study is not without limitations. First of all, our retrospective assessment of adverse life events was obtained at the same time as the eating behavior assessment. Thus, given this essentially cross-sectional design, we can only describe associations but not infer on causality. Our study reported the presence of a graded association, with the strength of the correlation being higher when three or more adverse life events were reported by the mothers, and being gradually lower for two and one reported adverse life events. Biological plausibility, consistency of an association across different

populations, as well as a dose–response relationship are among the so-called Bradford Hill criteria to establish a causal relation (A. B. Hill, 1965; Phillips & Goodman, 2004). As such, our study contributes to the field, although a prospective design is needed to affirm causal relations.

Secondly, although children's scores on the eating behavior scales were rather comparable with other studies (Braet & Van Strien, 1997; Caccialanza et al., 2004; Rodenburg, Kremers, Oenema, & van de Mheen, 2012; Sleddens et al., 2008), the families who were lost to follow-up presented more parental psychopathology and were of lower socioeconomic background. These characteristics are associated with both adverse life events and emotional overeating and restrained eating (Striegel-Moore et al., 2009), meaning that our estimates of the association of adverse life events with eating behaviors may be biased by selection on these factors. In order to reduce the consequences of selective follow-up, we performed multiple imputation on our covariates data.

Thirdly, both the evaluations on adverse life events and the reports on emotional overeating and restrained eating were based on mothers-report only, which may have resulted in measurement error. Mothers may have provided socially desirable or biased reports, although for the CEBQ, parent-reports of children's eating behaviors showed good concurrent validity with observations of actual eating behaviors (Wardle et al., 2001). Regarding the adverse life events, it may have occurred, however, that mothers deliberately omitted the report of life events or that they were not aware of the occurrence of some events. This limitation may be amplified by the choice to only consider those events as "adverse" for which the mother reported a "moderate" or "lot of" impact on the child—potentially, this report was colored by the impact the event had on the mother. Therefore, we strongly advice future studies to adopt a multi-informant strategy, involving self-reports and reports from other caregivers.

Moreover, our study did not differentiate between different types of life events and between one-time and chronic adversities. Different types of events and different durations might have a differential impact on emotional overeating and restrained eating of children.

5 | CONCLUSIONS

To our knowledge, this is the first population-based study showing an association between adverse life events and emotional overeating and restrained eating in middle childhood, all outcomes as reported by mothers of the children in this sample. Future longitudinal studies using multiple reporters are needed to further describe the nature and developmental course of this relationship, to further assess the effects of specific adverse events, and, finally, to unravel the extent to which these eating behaviors in middle childhood might be on the pathway from adverse life events to clinical eating disorders later in life.

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CONFLICT OF INTEREST

The authors declared no potential conflicts of interest.

AUTHOR CONTRIBUTIONS

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Robin Thomas and Pauline W. Jansen. The first draft of the manuscript was written by Robin Thomas and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

DATA AVAILABILITY STATEMENT

The Generation R Study has an open policy in regards to collaboration with other research groups (http://www.generationr.nl/researchers/collaboration.html). Requests for data access and collaboration can be directed to datamanagementgenr@erasmusmc.nl and will be discussed in the Generation R Management Team.

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REFERENCES

Afifi, T. O., Sareen, J., Fortier, J., Taillieu, T., Turner, S., Cheung, K., & Henriksen, C. A. (2017). Child maltreatment and eating disorders among men and women in adulthood: Results from a nationally representative United States sample. *International Journal of Eating Disorders*, *50*(11), 1281–1296. https://doi.org/10.1002/eat.22783

Adam, T. C., & Epel, E. S. (2007). Stress, eating and the reward system. *Physiology and Behavior*, *91*(4), 449–458. https://doi.org/10.1016/j.physbeh.2007.04.011

Almuneef, M., ElChoueiry, N., Saleheen, H. N., & Al-Eissa, M. (2017). Gender-based disparities in the impact of adverse childhood experiences on adult health: Findings from a national study in the Kingdom of Saudi Arabia. *International Journal for Equity in Health*, *16*(1), 90. https://doi.org/10.1186/s12939-017-0588-9

American Psychiatric Association. (2001). *Diagnostic and statistical manual of mental disorders (DSM-IV-TR)*, Washington DC: American Psychiatric Association.

Amone-P'Olak, K., Ormel, J., Huisman, M., Verhulst, F. C., Oldehinkel, A. J., & Burger, H. (2009). Life stressors as mediators of the relation between socioeconomic position and mental health problems in early adolescence: The TRAILS study. *Journal of the American Academy of Child and Adolescent Psychiatry*, *48*(10), 1031–1038. https://doi.org/10.1097/CHI.0b013e3181b39595

Bjørklund, O., Wichstrøm, L., Llewellyn, C. H., & Steinsbekk, S. (2019). Emotional over- and undereating in children: A longitudinal analysis of

child and contextual predictors. *Child Development*, *90*(6), 803–818. https://doi.org/10.1111/cdev.13110

Bolhuis, K., Koopman-Verhoeff, M. E., Blanken, L. M. E., Cibrev, D., Jaddoe, V. W. V., Verhulst, F. C., … Tiemeier, H. (2018). Psychotic-like experiences in pre-adolescence: What precedes the antecedent symptoms of severe mental illness? *Acta Psychiatrica Scandinavica*, *138*(1), 15–25. https://doi.org/10.1111/acps.12891

Braet, C., & Van Strien, T. (1997). Assessment of emotional, externally induced and restrained eating behaviour in nine to twelve-year-old obese and non-obese children. *Behaviour Research and Therapy*, *35*(9), 863–873. https://doi.org/10.1016/S0005-7967(97)00045-4

Caccialanza, R., Nicholls, D., Cena, H., Maccarini, L., Rezzani, C., Antonioli, L., … Roggi, C. (2004). Validation of the Dutch Eating Behaviour Questionnaire parent version (DEBQ-P) in the Italian population: A screening tool to detect differences in eating behaviour among obese, overweight and normal-weight preadolescents. *European Journal of Clinical Nutrition*, *58*(9), 1217–1222. https://doi.org/10.1038/sj.ejcn.1601949

Cardona Cano, S., Hoek, H. W., van Hoeken, D., de Barse, L. M., Jaddoe, V. W. V., Verhulst, F. C., & Tiemeier, H. (2016). Behavioral outcomes of picky eating in childhood: A prospective study in the general population. *Journal of Child Psychology and Psychiatry*, *57*(11), 1239–1246. https://doi.org/10.1111/jcpp.12530

Center for Research and Statistics. (2005). http://www.cos.rotterdam.nl

Chao, A. M., Jastreboff, A. M., White, M. A., Grilo, C. M., & Sinha, R. (2017). Stress, cortisol, and other appetite-related hormones: Prospective prediction of 6-month changes in food cravings and weight. *Obesity*, *25*(4), 713–720. https://doi.org/10.1002/oby.21790

Charmandari, E., Tsigos, C., & Chrousos, G. (2005). Endocrinology of the stress response. *Annual Review of Physiology*, *67*(1), 259–284. https://doi.org/10.1146/annurev.physiol.67.040403.120816

Clinton, D. (2006). Affect regulation, object relations and the central symptoms of eating disorders. *European Eating Disorders Review*, *14*(4), 203–211. https://doi.org/10.1002/erv.710

Coêlho, B. M., Santana, G. L., Duarte-Guerra, L. S., Viana, M. C., Neto, F. L., Andrade, L. H., & Wang, Y. P. (2018). The role of gender in the structure of networks of childhood adversity. *Psychiatry Research*, *270*, 348–356. https://doi.org/10.1016/j.psychres.2018.09.059

Connors, M. E., & Morse, W. (1993). Sexual abuse and eating disorders: A review. *International Journal of Eating Disorders*, *13*(1), 1–11. https://doi.org/10.1002/1098-108X(199301)13:1<1::AID-EAT2260130102>3.0.CO;2-P

Dakanalis, A., Timko, C. A., Carrà, G., Clerici, M., Zanetti, M. A., Riva, G., & Caccialanza, R. (2014). Testing the original and the extended dual-pathway model of lack of control over eating in adolescent girls. A two-year longitudinal study. *Appetite*, *82*, 180–193. https://doi.org/10.1016/j.appet.2014.07.022

Danese, A., & Tan, M. (2014). Childhood maltreatment and obesity: Systematic review and meta-analysis. *Molecular Psychiatry*, *19*(5), 544–554. https://doi.org/10.1038/mp.2013.54

Daughters, S. B., Gorka, S. M., Matusiewicz, A., & Anderson, K. (2013). Gender specific effect of psychological stress and cortisol reactivity on adolescent risk taking. *Journal of Abnormal Child Psychology*, *41*(5), 749–758. https://doi.org/10.1007/s10802-013-9713-4

de Barse, L. M., Tiemeier, H., Leermakers, E. T. M., Voortman, T., Jaddoe, V. W. V., Edelson, L. R., … Jansen, P. W. (2015). Longitudinal association between preschool fussy eating and body composition at 6 years of age: The Generation R Study. *International Journal of Behavioral Nutrition and Physical Activity*, *12*(1), 153. https://doi.org/10.1186/s12966-015-0313-2

Degortes, D., Santonastaso, P., Zanetti, T., Tenconi, E., Veronese, A., & Favaro, A. (2014). Stressful life events and binge eating disorder. *European Eating Disorders Review*, *22*(5), 378–382. https://doi.org/10.1002/erv.2308

Derogatis, L. R. (1983). The brief symptom inventory: An introductory report. *Psychological Medicine*, *13*(3), 595–605. https://doi.org/10.1017/S0033291700048017

Dubois, L., Farmer, A., Girard, M., Peterson, K., & Tatone-Tokuda, F. (2007). Problem eating behaviors related to social factors and body weight in preschool children: A longitudinal study. *International Journal of Behavioral Nutrition and Physical Activity*, *4*(1), 9. https://doi.org/10.1186/1479-5868-4-9

Eldredge, K. L., & Agras, W. S. (1996). Weight and shape overconcern and emotional eating in binge eating disorder. *International Journal of Eating Disorders*, *19*(1), 73–82. https://doi.org/10.1002/(SICI)1098-108X(199601)19:1<73::AID-EAT9>3.0.CO;2-T

Fairburn, C. G., Welch, S. L., Doll, H. A., Davies, B. A., & O'Connor, M. E. (1997). Risk factors for bulimia nervosa: A community-based case-control study. *Archives of General Psychiatry*, *54*(6), 509–517. https://doi.org/10.1001/archpsyc.1997.01830180015003

Flament, M. F., Buchholz, A., Henderson, K., Obeid, N., Maras, D., Schubert, N., … Goldfield, G. (2015). Comparative distribution and validity of DSM-IV and DSM-5 diagnoses of eating disorders in adolescents from the community. *European Eating Disorders Review*, *23*(2), 163–169. https://doi.org/10.1002/erv.2339

Galaif, E. R., Sussman, S., Chou, C. P., & Wills, T. A. (2003). Longitudinal relations among depression, stress, and coping in high risk youth. *Journal of Youth and Adolescence*, *32*(4), 243–258. https://doi.org/10.1023/A:1023028809718

Garfinkel, P. E. (2002). Classification and diagnosis of eating disorders. *Eating Disorders and Obesity: A Comprehensive Handbook*, *2*, 155–161.

Geliebter, A., & Aversa, A. (2003). Emotional eating in overweight, normal weight, and underweight individuals. *Eating Behaviors*, *3*(4), 341–347. https://doi.org/10.1016/S1471-0153(02)00100-9

Goossens, L., Braet, C., Van Vlierberghe, L., & Mels, S. (2009). Loss of control over eating in overweight youngsters: The role of anxiety, depression and emotional eating. *European Eating Disorders Review*, *17*(1), 68–78. https://doi.org/10.1002/erv.892

Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology*, *60*(1), 549–576. https://doi.org/10.1146/annurev.psych.58.110405.085530

Hankin, B. L., Mermelstein, R., & Roesch, L. (2007). Sex differences in adolescent depression: Stress exposure and reactivity models. *Child Development*, *78*(1), 279–295. https://doi.org/10.1111/j.1467-8624.2007.00997.x

Hill, A. B. (1965). The environment and disease: Association or causation? *Proceedings of the Royal Society of Medicine*, *58*(5), 295–300. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1898525/?page=2

Hill, A. J. (1993). Pre-adolescent dieting: Implications for eating disorders. *International Review of Psychiatry*, *5*(1), 87–100. https://doi.org/10.3109/09540269309028297

Jaddoe, V. W. V., Mackenbach, J. P., Moll, H. A., Steegers, E. A. P., Tiemeier, H., Verhulst, F. C., … Hofman, A. (2006). The Generation R Study: Design and cohort profile. *European Journal of Epidemiology*, *21*(6), 475–484. https://doi.org/10.1007/s10654-006-9022-0

Jansen, P. W., Roza, S. J., Jaddoe, V. W., Mackenbach, J. D., Raat, H., Hofman, A., … Tiemeier, H. (2012). Children's eating behavior, feeding practices of parents and weight problems in early childhood: Results from the population-based Generation R Study. *International Journal of Behavioral Nutrition and Physical Activity*, *9*(1), 130. https://doi.org/10.1186/1479-5868-9-130

Kent, A., Waller, G., & Dagnan, D. (1999). A greater role of emotional than physical or sexual abuse in predicting disordered eating attitudes: The role of mediating variables. *International Journal of Eating Disorders*, *25*(2), 159–167. https://doi.org/10.1002/(SICI)1098-108X(199903)25:2<159::AID-EAT5>3.0.CO;2-F

Kessler, R. C., McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., … Williams, D. R. (2010). Childhood

adversities and adult psychopathology in the WHO world mental health surveys. *British Journal of Psychiatry*, *197*(5), 378–385. https://doi.org/10.1192/bjp.bp.110.080499

Kooijman, M. N., Kruithof, C. J., van Duijn, C. M., Duijts, L., Franco, O. H., van IJzendoorn, M. H., … Jaddoe, V. W. V. (2016). The generation R study: Design and cohort update 2017. *European Journal of Epidemiology*, *31*(12), 1243–1264. https://doi.org/10.1007/s10654-016-0224-9

Lindeman, M., & Stark, K. (2001). Emotional eating and eating disorder psychopathology. *Eating Disorders*, *9*(3), 251–259. https://doi.org/10.1080/10640260127552

Loth, K., van den Berg, P., Eisenberg, M. E., & Neumark-Sztainer, D. (2008). Stressful life events and disordered eating behaviors: Findings from project EAT. *Journal of Adolescent Health*, *43*(5), 514–516. https://doi.org/10.1016/j.jadohealth.2008.03.007

Madowitz, J., Matheson, B. E., & Liang, J. (2015). The relationship between eating disorders and sexual trauma. *Eating and Weight Disorders*, *20*(3), 281–293. https://doi.org/10.1007/s40519-015-0195-y

Mendenhall, E., Kohrt, B. A., Norris, S. A., Ndetei, D., & Prabhakaran, D. (2017). Non-communicable disease syndemics: Poverty, depression, and diabetes among low-income populations. *The Lancet*, *389*(10072), 951–963. https://doi.org/10.1016/S0140-6736(17)30402-6

Michels, N., Sioen, I., Boone, L., Braet, C., Vanaelst, B., Huybrechts, I., & de Henauw, S. D. (2015). Longitudinal association between child stress and lifestyle. *Health Psychology*, *34*(1), 40–50. https://doi.org/10.1037/hea0000108

Michels, N., Sioen, I., Braet, C., Eiben, G., Hebestreit, A., Huybrechts, I., … De Henauw, S. (2012). Stress, emotional eating behaviour and dietary patterns in children. *Appetite*, *59*(3), 762–769. https://doi.org/10.1016/j.appet.2012.08.010

Michopoulos, V., Powers, A., Moore, C., Villarreal, S., Ressler, K. J., & Bradley, B. (2015). The mediating role of emotion dysregulation and depression on the relationship between childhood trauma exposure and emotional eating. *Appetite*, *91*, 129–136. https://doi.org/10.1016/j.appet.2015.03.036

Molendijk, M. L., Hoek, H. W., Brewerton, T. D., & Elzinga, B. M. (2017). Childhood maltreatment and eating disorder pathology: A systematic review and dose-response meta-analysis. *Psychological Medicine*, *47*(8), 1402–1416. https://doi.org/10.1017/S0033291716003561

Overton, A., Selway, S., Strongman, K., & Houston, M. (2005). Eating disorders - The regulation of positive as well as negative emotion experience. *Journal of Clinical Psychology in Medical Settings*, *12*(1), 39–56. https://doi.org/10.1007/s10880-005-0911-2

Pegington, M., French, D. P., & Harvie, M. N. (2020). Why young women gain weight: A narrative review of influencing factors and possible solutions. *Obesity Reviews*, *21*, e13002. https://doi.org/10.1111/obr.13002

Phillips, C. V., & Goodman, K. J. (2004). The missed lessons of Sir Austin Bradford Hill. *Epidemiologic Perspectives and Innovations*, *1*, 3. https://doi.org/10.1186/1742-5573-1-3

Polivy, J., Herman, C. P., & McFarlane, T. (1994). Effects of anxiety on eating: Does palatability moderate distress-induced overeating in dieters? *Journal of Abnormal Psychology*, *103*(3), 505–510. https://doi.org/10.1037/0021-843X.103.3.505

Rodenburg, G., Kremers, S. P. J., Oenema, A., & van de Mheen, D. (2012). Associations of children's appetitive traits with weight and dietary behaviours in the context of general parenting. *PLoS One*, *7*(12), e50642. https://doi.org/10.1371/journal.pone.0050642

Rorty, M., Yager, J., & Rossotto, E. (1995). Aspects of childhood physical punishment and family environment correlates in bulimia nervosa. *Child Abuse and Neglect*, *19*(6), 659–667. https://doi.org/10.1016/0145-2134(95)00024-3

Schmidt, U., Tiller, J., Blanchard, M., Andrews, B., & Treasure, J. (1997). Is there a specific trauma precipitating anorexia nervosa? *Psychological Medicine*, *27*(3), 523–530. https://doi.org/10.1017/S0033291796004369

Scott, K. M., Von Korff, M., Angermeyer, M. C., Benjet, C., Bruffaerts, R., De Girolamo, G., … Kessler, R. C. (2011). Association of childhood adversities and early-onset mental disorders with adult-onset chronic physical conditions. *Archives of General Psychiatry*, *68*(8), 838–844. https://doi.org/10.1001/archgenpsychiatry.2011.77

Sleddens, E. F., Kremers, S. P., & Thijs, C. (2008). The children's eating behaviour questionnaire: Factorial validity and association with body mass index in Dutch children aged 6-7. *International Journal of Behavioral Nutrition and Physical Activity*, *5*(1), 49. https://doi.org/10.1186/1479-5868-5-49

Smyth, J. M., Heron, K. E., Wonderlich, S. A., Crosby, R. D., & Thompson, K. M. (2008). The influence of reported trauma and adverse events on eating disturbance in young adults. *International Journal of Eating Disorders*, *41*(3), 195–202. https://doi.org/10.1002/eat.20490

Sterne, J. A. C., White, I. R., Carlin, J. B., Spratt, M., Royston, P., Kenward, M. G., … Carpenter, J. R. (2009). Multiple imputation for missing data in epidemiological and clinical research: Potential and pitfalls. *BMJ*, *339*(7713), 157–160. https://doi.org/10.1136/bmj.b2393

Stice, E., Marti, C. N., Shaw, H., & Jaconis, M. (2009). An 8-year longitudinal study of the natural history of threshold, subthreshold, and partial eating disorders from a community sample of adolescents. *Journal of Abnormal Psychology*, *118*(3), 587–597. https://doi.org/10.1037/a0016481

Striegel-Moore, R. H., Rosselli, F., Perrin, N., DeBar, L., Wilson, G. T., May, A., & Kraemer, H. C. (2009). Gender difference in the prevalence of eating disorder symptoms. *International Journal of Eating Disorders*, *42*(5), 471–474. https://doi.org/10.1002/eat.20625

Swanson, S. A., Crow, S. J., Le Grange, D., Swendsen, J., & Merikangas, K. R. (2011). Prevalence and correlates of eating disorders in adolescents: Results from the national comorbidity survey replication adolescent supplement. *Archives of General Psychiatry*, *68*(7), 714–723. https://doi.org/10.1001/archgenpsychiatry.2011.22

Tanofsky-Kraff, M., Theim, K. R., Yanovski, S. Z., Bassett, A. M., Burns, N. P., Ranzenhofer, L. M., … Yanovski, J. A. (2007). Validation of the emotional eating scale adapted for use in children and adolescents (EES-C). *International Journal of Eating Disorders*, *40*(3), 232–240. https://doi.org/10.1002/eat.20362

Taylor, C. B., & Altman, T. (1997). Priorities in prevention research for eating disorders. *Psychopharmacology Bulletin*, *33*(3), 413–417. http://www.ncbi.nlm.nih.gov/pubmed/9550886

Torres, S., Guerra, M. P., Lencastre, L., Roma-Torres, A., Brandão, I., Queirós, C., & Vieira, F. (2011). Cognitive processing of emotions in anorexia nervosa. *European Eating Disorders Review*, *19*(2), 100–111. https://doi.org/10.1002/erv.1046

van Strien, T. (2018). Causes of emotional eating and matched treatment of obesity. *Current Diabetes Reports*, *18*(6), 1. https://doi.org/10.1007/s11892-018-1000-x

van Strien, T., Frijters, J. E. R., Bergers, G. P. A., & Defares, P. B. (1986). The Dutch eating behavior questionnaire (DEBQ) for assessment of restrained, emotional, and external eating behavior. *International Journal of Eating Disorders*, *5*(2), 295–315. https://doi.org/10.1002/1098-108X(198602)5:2<295::AID-EAT2260050209>3.0.CO;2-T

Van Strien, T., Frijters, J. E. R., Roosen, R. G. F. M., Knuiman-Hijl, W. J. H., & Defares, P. B. (1985). Eating behavior, personality traits and body mass in women. *Addictive Behaviors*, *10*(4), 333–343. https://doi.org/10.1016/0306-4603(85)90029-2

van Strien, T., & Oosterveld, P. (2008). The children's DEBQ for assessment of restrained, emotional, and external eating in 7- to 12-year-old children. *International Journal of Eating Disorders*, *41*(1), 72–81. https://doi.org/10.1002/eat.20424

Van Strien, T., Schippers, G. M., & Cox, W. M. (1995). On the relationship between emotional and external eating behavior. *Addictive Behaviors*, *20*(5), 585–594. https://doi.org/10.1016/0306-4603(95)00018-8

Waller, G., & Osman, S. (1998). Emotional eating and eating psychopathology among non-eating-disordered women. *International Journal of Eating Disorders*, *23*(4), 419–424. https://doi.org/10.1002/(SICI)1098-108X(199805)23:4<419::AID-EAT9>3.0.CO;2-L

Wardle, J., Guthrie, C. A., Sanderson, S., & Rapoport, L. (2001). Development of the children's eating behaviour questionnaire. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *42*(7), 963–970. https://doi.org/10.1111/1469-7610.00792

Welch, S. L., Doll, H. A., & Fairburn, C. G. (1997). Life events and the onset of bulimia nervosa: A controlled study. *Psychological Medicine*, *27*(3), 515–522. https://doi.org/10.1017/S0033291796004370

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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