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Research report

Stress, emotional eating behaviour and dietary patterns in children

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ABSTRACT

Psychological stress has been suggested to change dietary pattern towards more unhealthy choices and as such to contribute to overweight. Emotional eating behaviour could be an underlying mediating mechanism. The interrelationship between stress, emotional eating behaviour and dietary patterns has only rarely been examined in young children. Nevertheless, research in children is pivotal as the foundations of dietary habits are established starting from childhood and may track into adulthood. In 437 children (5–12 years) of the ChiBS study, stress was measured by questionnaires on stressful events, emotions (happy, angry, sad, anxious) and problems (emotional, peer, conduct and hyperactivity). Data were collected on children's emotional eating behaviour and also on dietary patterns: frequency of fatty foods, sweet foods, snacks (fat and sweet), fruit and vegetables. Stressful events, negative emotions and problems were positively associated with emotional eating. Positive associations were observed between problems and both sweet and fatty foods consumption. Negative associations were observed between events and fruit and vegetables consumption. Overall, stress was associated with emotional eating and a more unhealthy dietary pattern and could thus contribute to the development of overweight, also in children. Nevertheless, emotional eating behaviour was not observed to mediate the stress–diet relation.

Introduction

The importance of a healthy diet is widely accepted. More specifically, dietary guidelines are formulated in the prevention of obesity with a focus on high intakes of fruit and vegetables and low intake of energy dense foods like those high in fat and sugar (World Health Organization, 2003). The foundations of dietary habits are established from the ages of 3–4 years old (Singer, Moore, Garrahie, & Ellison, 1995) and may track into adolescence and adulthood (Mikkila, Rasanen, Raitakari, Pietinen, & Viikari, 2005; Wang, Bentley, Zhai, & Popkin, 2002).

An overall healthy diet consists of both a balanced food and nutrient composition as well as a balanced eating behaviour. A balanced eating behaviour comprises eating when feeling hungry, at regular moments to allow physiological growth and energy expenditure. However, a trend of eating in the absence of hunger and intermittent snacking is increasingly observed in the eating pattern in Western society. This unhealthy eating behaviour is related with unfavourable outcomes (unbalanced intake with too much fat and sugar leading to overweight in genetic at risk groups), making it pivotal to study its determinants.

Stress has been associated both with unhealthy emotional eating behaviour and an imbalanced dietary pattern (Adam & Epel, 2007; Dallman et al., 2003; Macht, 2008). However, several research gaps remain unresolved. For example it is relevant to test if stress is related with specific indices of food intake like higher consumption of fatty foods, sweet foods or both (e.g. snacks) and whether emotional eating can be seen as the mechanism underlying the assumed link between stress and an imbalanced dietary pattern. After all, emotional eating is hypothesized as a way of avoidant stress coping, eating induced stress reduction or because of the reward feelings associated with the food (Adam & Epel, 2007; Dallman et al., 2003).

Epidemiological research investigating the influence of stress on children's diet is rather scarce and has mostly been performed in small samples, among adolescents, in laboratory conditions or focused on only one aspect of stress and mostly with indirect measures of imbalanced eating (e.g. increase in weight). As far as we know, only one study in children has included both a specific naturalistic stress measure and a direct measure of the individual's dietary pattern (Jenkins, Rew, & Sternglanz, 2005).

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Therefore, this study aims to fill this research gap by investigating the relationship between several stress measures, emotional eating behaviour and dietary patterns (sweet foods, fatty foods, snacks but also fruit and vegetables) in a sample of preadolescent children. Furthermore, the possible mediation effect of emotional eating behaviour will be tested. Especially in young children studying the role of stress on dietary intake is challenging as parents still highly control their child's diet, while at the same time children already start to develop their own preferences.

Methods

Participants and general procedures

The subjects were 437 Belgian children (49.9% boys) between 5 and 12 years old participating in the ChiBS study (Children's Body composition and Stress) in 2011. The ChiBS study examines stress and the relationship between stress and body composition development in primary school children. All children from the first to fourth year of primary schools in the Belgian city Aalter (in the northern, Dutch-speaking part of Belgium) were invited via the school to enter the study for the baseline stress measurements in 2010. The final purpose was to follow them up during 2 years, finally covering all years of primary school (first to sixth year). In 2011, the children of the baseline study were re-invited, resulting in a participation number of 453 children. Because of some incomplete questionnaires, only 437 children were included for this paper. Detailed aims, design, methods, population and participation characteristics were described elsewhere (Michels et al., 2012). The study was conducted according to the guidelines laid down in the Declaration of Helsinki and the project protocol was approved by the Ethics Committee of the Ghent University Hospital. Parents gave their written informed consent.

Parents and their children were invited for an individual appointment at the local municipal sports park (Aalter, Flanders, Belgium). Children had to fill in questionnaires on stress and on their emotional eating behaviour with assistance of a trained researcher. Parents had to fill in a general questionnaire on demographic characteristics, a questionnaire on their child's strengths and difficulties and their child's dietary patterns. Furthermore, children were measured for anthropometrics.

Questionnaires on children's stress: problems, emotions, life events and coping

Stress arises when the demands of a situation exceed an individual's ability to cope and resolve the problem, resulting in emotional, behavioural and cognitive disturbances (McCance, Forshee, & Shelby, 2006). Besides life events, which are assumed to profoundly affect someone's life, daily annoyances and minor hassles are also seen as an important stressor (Kanner, Coyne, Schaefer, & Lazarus, 1981). However, some events can have greater impact than others. Therefore, stress is for research purposes often operationalized on the symptom level by measuring (a) the daily problems that someone is reporting or (b) the daily emotions someone is feeling or (c) the way someone is handling the problems and feelings.

Problems

Parents were asked to complete the 'Strengths and Difficulties Questionnaire' (SDQ) (Goodman, 1997), reporting the problems of their child over the past 6 months (reliability ICC = 0.80; concurrent validity $r = 0.70$). For each of the 25 statements, parents could answer: 'not true' (0), 'somewhat true' (1) and 'certainly true' (2). The statements were divided in five subscales of five items each: emotional problems, conduct problems, hyperactivity problems, peer problems and prosocial behaviour. Higher scores on the prosocial behaviour subscale reflect strengths, whereas higher scores on the other four subscales reflect difficulties.

Life events

The 'Coddington Life Events Scale' for children (CLES-C) (Coddington, 1972) was used to identify potential physical and mental health problems arising from psychological causalities (reliability $r = 0.69$, construct validity = 0.45). This validated 36-item questionnaire measured the self-reported frequency and timing of neutral and negative events in the last year relevant for this age group and resulted in a children's 'life change units' score for the time periods 0–3, 0–6, 0–9 and 0–12 months ago. In this paper, only the negative event score for the last 6 months was used as the problems were also recorded for this time period.

Daily events: hassles and uplifts

The children's daily hassles (CHS) and daily uplifts (CUS) scales of Kanner et al. (1981) contain 25 hassles and 25 uplifts, respectively (internal consistency: Cronbach's alpha = 0.87). Hassles refer to irritating, frustrating or distressing demands that characterize everyday transactions with the environment. Uplifts refer to positive experiences such as the joy derived from friendship, relief at hearing good news and so on. Children were asked to indicate which hassles and uplifts occurred during the last month. Furthermore, they were asked to rate whether they felt 'not bad' (2 points), 'sort of bad' (3 points), or 'very bad' (4 points) as a result of the hassle and whether they felt 'OK' (2 points), 'sort of good' (3 points) or 'very good' (4 points) as a result of the uplift. An intensity score was used for the hassles (=severity sum of the indicated events) and a frequency score for the uplifts (=amount of events).

Emotions

Children had to indicate on a Likert-scale how they felt recently. The feelings happiness, anger, sadness and anxiety were rated from 0 'not at all' to 10 'very strong' as was done by Zimmer-Gembeck, Lees, Bradley, and Skinner (2009). To help the children understand these distinct feelings, four pictures of a social skills training game for very young children were displayed next to the question (one picture for each emotion) (Dupondt, 1992). These basic emotions are already understandable during infancy (Flavell, 1999) and can as such uncomplicatedly be used in our age-group.

Coping

The children were asked what they usually do when confronted with problems or when they are upset using an eight item-questionnaire, with 'never' (0), 'sometimes' (1) or 'often' (2) as response alternatives. This questionnaire was previously used in the CASE-study (Child and Adolescent Self-harm in Europe) (Madge et al., 2008) and translated into Dutch and substantially pilot-tested for a population of Belgian adolescents (Portzky, De Wilde, & van Heeringen, 2008). The answers were classified as emotion- versus problem-focused coping, based on the transactional model of Folkman and Lazarus (1986). Emotion-focused coping is aimed at regulating emotional stress while problem-focused coping deals with the problem and makes changes in the disturbed and stress-inducing person-environment relationship. A coping index was calculated as "problem-focused coping minus emotion-focused coping", with positive values representing more problem-focused coping.