



Research report

Earlier predictors of eating disorder symptoms in 9-year-old children. A longitudinal study

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ABSTRACT

The aim of the study was to examine predictors of eating disorder symptoms in a population based sample at the earliest age at which they can be measured using the Children's Eating Attitudes Test. Data were collected from the longitudinal Gateshead Millennium Study cohort; 609 children participated in the 7 year data sweep (and their mothers and teachers), and 589 children participated in the 9 year data sweep. Eating disorder symptoms at 9 years were higher in boys, and in children from more deprived families. Higher eating disorder symptoms were associated with more body dissatisfaction at 9 years. Higher symptoms were predicted by higher levels of dietary restraint and of emotional symptoms, but not greater body dissatisfaction, 2 years earlier. The study showed that some correlates of high eating disorder symptoms found in adolescents and adults are also found in children, before the rise in diagnosable eating disorders over the pubertal period.

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Introduction

Eating disorders typically develop over puberty. For example, using data from a longitudinal epidemiological study an incidence of zero at 8–9 years, rising to a peak of 7–8/100,000 at 16–17 years was reported (Lewinsohn, Striegel-Moore, & Seeley, 2000). A recent UK study based on national surveillance reported an incidence of zero at 5 years, rising to 3.56/100,000 at 11–12 years and 9.51/100,000 at 12–13 years (Nicholls, Lynn, & Viner, 2011). For this reason many studies of the development of eating disorders have started in the pubertal period, often at 12 years of age. But it is a striking fact that these longitudinal studies of eating disorders over adolescence have generally found that the strongest predictors of later eating disorder symptoms are symptoms already present at the start of the study (Attie & Brooks-Gunn, 1989; Calam & Waller, 1998; Cattarin & Thompson, 1994; Wichstrøm, 2000). Wichstrøm (2000) for example, used a representative nationwide sample of

7751 Norwegian adolescents and found that in their youngest group the best predictor of later high Eating Attitudes Test (Garner & Garfinkel, 1979; Garner, Olmsted, Bohr, & Garfinkel, 1982) (EAT) scores (apart from sex) was high EAT scores at 12. The implication is that although clinical eating disorders themselves mostly develop from the time of puberty onwards, psychological symptoms characteristic of the disorders are already present earlier. Further work in these earlier years is therefore needed if the developmental psychopathology of the eating disorders is to be understood. The earliest age at which a test analogous to the EAT can be used is 8 or 9 years, when a children's version provides age appropriate questions concerning eating attitudes that are similar to the questions asked of adults in the EAT itself: the Children's Eating Attitudes Test (ChEAT) (Garner & Garfinkel, 1979; Garner et al., 1982; Maloney, McGuire, & Daniels, 1988). In the context of the Gateshead Millennium Study (GMS), a population based cohort principally concerned with children's growth and behaviour, we used the ChEAT to assess eating attitudes at 9 years of age, and related the scores to the children's body image, dietary restraint, emotional symptoms and anthropometric characteristics recorded at the time, and 2 years earlier when the children were 7 years.

Our first aim was to investigate body dissatisfaction in children at 7 and 9 years and its relationship with the child's sex and

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anthropometric characteristics. Body dissatisfaction after puberty is more prevalent in females. It is undoubtedly present before puberty (Collins, 1991; Davison, Markey, & Birch, 2000; Hill, Draper, & Stack, 1994; Truby & Paxton, 2002), but the sex difference is less clear in younger children. Using a children's version of the figure drawings of Stunkard, Sørensen, and Schulsinger (1983) to assess the child's choice of their actual and ideal body shape, both Collins (1991) and Wood, Becker, and Thompson (1996) found significant differences between boys and girls at 6–9 and 8–10 years of age respectively. Using photographic images of real children of known body mass index (BMI) however, Truby and Paxton (2002) found no sex difference in 7–10 year old children, so we re-examined this using the same photographic images but in a substantially larger sample. A number of studies have shown that a higher BMI in children is related to body dissatisfaction (Erickson & Gerstle, 2007; Hill, 1993; Ricciardelli & McCabe, 2001; Rolland, Farnill, & Griffiths, 1997) even as young as 5 years (Davison et al., 2000). But the BMI reflects frame size as well as adiposity, and in adult women there is evidence that weight dissatisfaction is related to frame size rather than to adiposity (Davis, Durnin, Gurevich, Le Maire, & Dionne, 1993). To date there is no published research examining the relative importance of adiposity and frame size in body dissatisfaction in children. We therefore examined the relative importance of frame size and the BMI in children's body dissatisfaction.

Our second aim was to record eating disorder symptoms as identified using the ChEAT scores at 9 years in this population based sample, and to examine the relationship of these to the child's sex, and to socio-demographic characteristics of their families. Eating disorders, like depression, have a strong female preponderance from adolescence onwards. However, the sex difference in depression is not present in earlier childhood (Rutter, Caspi, & Moffitt, 2003). It is important therefore to investigate whether there is a sex difference in eating disorder symptoms in younger prepubertal children. We also examined socio-economic characteristics, as the relationship between the prevalence of eating disorders and socio-demographic characteristics remains at present a matter of controversy (Gard & Freeman, 1996).

Our third aim was to examine the relationships between the ChEAT scores at 9 years and a range of more specific variables that predict eating disorders in adolescents and adults. Body dissatisfaction is of particular importance as it predicts the later development of eating disorders (Stice, 2002; Stice & Shaw, 2002). In 8–13 year old children it is associated with higher ChEAT scores when measured at the same time (Erickson & Gerstle, 2007; Gardner, Stark, Friedman, & Jackson, 2000; Veron-Guidry & Williamson, 1996), but it would be particularly useful to know whether it is also an earlier risk factor, as it can be measured before the ChEAT itself can be used. We therefore examined whether body dissatisfaction measured at 7 years predicts ChEAT scores 2 years later. A further issue needing clarification is whether this association differs in boys and girls. In adolescents Keel, Fulkerson, and Leon (1997) found forward prediction only in boys, but Gardner et al. (2000) found it only in girls. We also examined the role of dietary restraint and of negative affect. According to the dual-pathway model these mediate the role of body dissatisfaction in the development of eating disorder symptoms (Stice, 1994, 2001).

Methods

Sample

A sample of 1029 infants (including twins) born to 1011 mothers was recruited shortly after birth in 1999/2000 to the longitudinal GMS. Full details of the study are published (Parkinson et al., 2010; Parkinson, Wright, & Drewett, 2007). All children whose

families had not previously asked to leave the study were eligible to participate in the 7 year and 9 year data sweeps.

Measures

Body image (child reports)

The Children's Body Image Scale (CBIS) (Truby & Paxton, 2002, 2008) consists of photographic figures of pre-pubescent children, seven each of boys and girls. The figures range from very thin to obese and each corresponds to a specific BMI range covering the 3rd–97th National Center for Health Statistics BMI percentiles for 10-year-old children (Hamill et al., 1979). The head of the same boy and girl is used in all the figures, so they differ only in their BMI. The CBIS scale asks: 'Looking at the pictures below, which body shape looks most like your own?' (perceived figure); and 'Looking at the same pictures, which body shape would you most like to have?' (preferred figure). CBIS categories were assigned scores of 1–7 to give an ordered numerical scale. A score for body size dissatisfaction was calculated by subtracting the child's perceived figure from their preferred figure. This is the same numerically as the body size dissatisfaction measure in Truby and Paxton (2002) except that we have reversed the sign so that a positive score indicates that the child would like to be fatter and a negative score that they would like to be thinner. We refer to this variable as 'body preference'. Even in 7 year old children this discrepancy measure is correlated with their verbal response on a 5-point scale asking whether they would like to be thinner or fatter (Truby & Paxton, 2002).

Eating attitudes (child reports)

The Children's Eating Attitudes Test (ChEAT) (Maloney et al., 1988), a modified version of the adult Eating Attitudes Test (EAT) (Garner & Garfinkel, 1979; Garner et al., 1982), is an instrument designed to detect disordered eating attitudes associated with those found in clinically diagnosed eating disorders. The ChEAT has 26 items with six responses (always; very often; often; sometimes; rarely; never). A higher score indicates a higher level of symptoms.

Restrained eating (child reports)

The Dutch Eating Behaviour Questionnaire child version (DEBQ-C) (van Strien & Oosterveld, 2008) was adapted for 7–12 year olds from the Dutch Eating Behaviour Questionnaire (DEBQ) (van Strien, Frijters, Bergers, & Defares, 1986; van Strien & Oosterveld, 2008), with some advice from the authors of the present paper on the wording of the English version. It assesses weight control and dieting behaviours in children. The DEBQ-C restraint scale has seven items with three responses (no; sometimes; yes). A higher score indicates greater restraint.

Emotional symptoms (teacher reports)

The Strengths and Difficulties Questionnaire (SDQ) (Goodman, 2001) is a widely used 25 item informant measure of psychological difficulties that can be completed by teachers. There are four problem behaviour subscales including an 'emotional' sub-scale comprising five questions concerning symptoms of anxiety and depression (Blom, Larsson, Serlachius, & Ingvar, 2010; Muris, Meesters, & van den Berg, 2003). Each item has three responses (not true; somewhat true; certainly true). A higher score indicates a higher level of the symptoms.

Body measurements (taken by researchers)

Weight and height were measured using equipment purchased from Chasmors, London. Each was measured twice, to 0.1 kg using Tanita scales TBF-300MA and to 0.1 cm with the head in the Frankfurt plane using a Leicester portable height measure, respectively.

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