

Research report

# Associations between maternal feeding style and food intake of children with a higher risk for overweight

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## Abstract

**Objective:** The aim of this study is to examine the impact of different feeding strategies on the child's food intake as well as the effect and influence socio-economic status and weight have on the use of feeding strategies.

**Methods:** 219 mothers and their children between 3 and 6 years of age at risk for becoming overweight took part in this cross-sectional study. The participating mothers were recruited from inpatient-clinics and kindergartens with a lower socio-economic background. Besides demographic and weight data, which describe the child's risk for overweight, the mothers were asked for their use of feeding strategies and their child's food intake.

**Results:** Maternal feeding practices have an important impact (22.2–26.9% explained variance) on the child's food intake. There are three strategies (rewarding, child's control and pressure) which turned out to be significant predictors. Additionally, the child's weight, family income and educational level have an effect on the choice of feeding strategies and their impact on the child's food intake.

**Conclusions:** The results are evidence of the influence of parental feeding practices on the child's food intake. Parent training in prevention and intervention of childhood obesity should include the discussion and modification of feeding practices.

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**Keywords:** Feeding strategies; Parental feeding; Obesity; Children; Child's food intake; Risk factors for overweight

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## Introduction

Overweight and obesity represent a worldwide problem which gains more and more attention. In Germany, about 3% of the 3–6-year-old children and even 6.4% of the 7–10-year-old (Kurth & Schaffrath Rosario, 2007) are already obese. Obesity is not merely a medical problem. Besides the increased risk for developing different physical secondary diseases such as diabetes, joint disorders and difficulties in breathing, emotional strains play an important role as well (Warschburger, 2005). In order to prevent obesity in childhood, we need a thorough understanding of risk factors and how to modify them. Past research showed that besides genetic and activity factors, the parental influence on eating behaviour and food intake of the child is also of importance for the development of obesity (Benton, 2004). Especially in the preschool ages, parents are solely responsible for the food choice and are trying to teach their child adequate eating behaviours by using different feeding strategies.

Parental feeding strategies are one way to influence the child's eating (Patrick, Nicklas, Hughes, & Morales, 2005). There are both direct (e.g., demands or restrictions) and indirect strategies (e.g., modelling or monitoring). A review by Faith, Scanlon, Birch, Francis, and Sherry (2004) shows evidence for the relationship between parental feeding strategies and food intake as well as the weight status of the child, 19 out of 22 studies found such associations. Restriction is the feeding strategy most often attributed to implicate a higher risk for overweight. Experimental studies indicate that this feeding strategy reduces the child's ability to regulate his energy intake (Birch & Fisher, 2000; Johnson & Birch, 1994) and increases the preference for the restricted food (Fisher & Birch, 1999, 2002). Additionally there is prospective evidence available underscoring that restrictive feeding was related to a higher weight status (Faith et al., 2004b; Francis, Hofer, & Birch, 2001). Other strategies, such as rewarding with food or pressure to eat, were also associated with more problematic eating behaviour. For example, rewarding the consumption of disliked food with snacks increases the preference for the snack and decreases the preference for the food that was initially promoted (Newman & Taylor, 1992; Vereecken, Keukelier, & Maes, 2004). Results from cross-sectional studies show that

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a higher parental frequency of pressurising the child to eat is associated with a lower child weight status (Matheson, Robinson, Varady, & Killen, 2006; Powers, Chamberlin, van Schaick, Sherman, & Whitaker, 2006; Spruijt-Metz, Lindquist, Birch, Fisher, & Goran, 2002) as well as frequent use of this strategy leads to an increase in children's food intake (Campbell, Crawford, & Ball, 2006; Lee, Mitchell, Smiciklas-Wright, & Birch, 2001). Indirect strategies were unfortunately investigated in only a few studies. Here especially, monitoring the child's food and giving the child more control over his food were reported to have both positive and negative associations to children's food intake and weight status (cf. Faith et al., 2003; Lissau, Breum, & Sørensen, 1993). For modelling as an indirect strategy there are also findings, which argue for a supportive effect in the development of healthy food intake (Campbell et al., 2006; Cullen et al., 2001; Wardle, Carnell, & Cooke, 2005)

The use of feeding strategies seems to be dependent of educational and economic background. There is evidence of more frequent use of strategies to control the child's food intake in households with a higher socio-economic status (Hupkens, Knibbe, van Otterloo, & Drop, 1998; Orrell-Valente et al., 2007; Robinson, Kiernan, Matheson, & Haydal, 2001). For a pressurising feeding style, a lower use was also found (Baughcum et al., 2001; Francis et al., 2001). In addition, the weight status of the whole family has an effect on both the choice of feeding strategies as well as their impact. There are studies, which failed to find any differences in feeding practices regarding maternal weight status (Wardle, Sanderson, Guthrie, Rapoport, & Plomin, 2002), but some studies suggest that overweight mothers control their child's food intake less (Orrell-Valente et al., 2007; Robinson et al., 2001). Furthermore, the weight status of the child is not only influenced by feeding strategies, but the choice of feeding strategies is also affected by child's weight. Results from cross-sectional analyses suggest that mothers use less pressurising, but more restrictive strategies towards heavier children (Keller, Pietrobello, Johnson, & Faith, 2006). Considering that most of these studies are cross-sectional, no causal conclusion can be drawn. Especially the inconsistent results for the impact of feeding strategies on the child's weight status could be indicative of the both-way interaction between these factors.

Due to the importance of the child's food intake for the development of obesity and the need to understand the influence of parents' behaviour, we will focus on this association within this study. We decided to take the child's food intake as an indicator for the influence of feeding strategies, whereas weight and socio-economic parameters were analysed with regard to their effect on the choice of feeding strategies. This way, a focus is set on prevention of obesity, and the problem of both-way interactions between feeding strategies and child's weight status can be handled. Hence, we will compare the feeding style of mothers with different weight status as well as over- and normal weight children. Additionally we will measure the associations between feeding practice and child's food intake, as an actual

indicator, which is sensitive for subsequent eating or weight problems. Previous studies generally focused on English-speaking, middle class samples. But obesity is often a problem in low income families. In addition, the overweight status of the parents is a well-known risk factor for obesity in the offspring. Since prevention strategies need to reach these groups, we will be concentrating on mothers with a lower socio-economic background and a higher weight. Furthermore we will explore a wider range of feeding strategies because past research has mostly concentrated on the strategies restriction and pressure. This study addresses the following questions:

- Do socio-economic and weight status influence the choice of feeding strategies?
- What impact do different feeding strategies have on the child's food intake?

## Methods

### *Procedure*

The participating mothers were recruited from inpatient-clinics ( $n = 147$ , 67.1%) and kindergartens ( $n = 72$ , 32.9%), where staff asked mothers of 3–6-year-old children to fill in a set of questionnaires concerning their own and their child's eating behaviour. Mothers from kindergartens got 5€ each for completing the questionnaire. Informed consent and ethical committee approval was obtained.

### *Measures*

#### *Risk factors for overweight*

Mothers reported their own height and weight. Those mothers and children recruited from clinics were additionally weighed by means of a standard beam scale (accurate to 100 g) and measured with a calibrated stadiometer (accurate to 1 cm). For mothers the subjective and for children the objective weight data were used for the calculation of the BMI. For better comparability of children's weight data, a standardized BMI (BMI-SDS) by means of age and sex (Kromeyer-Hauschild et al., 2001) was calculated additionally. On the basis of international cut-off points (WHO, 1995) and individual BMI percentiles (Kromeyer-Hauschild et al., 2001), the existence of overweight or obesity for mothers (BMI >25) and children (BMI percentile >90) was classified.

Socio-economic status was a composite measure of the family's net income and the mother's educational level. The income (including earnings, unemployment, housing, child or sickness benefits, pension or other earnings) was calculated with respect to the number of family members living in the household. Based on the 2005 German Report of Poorness and Richness (Bundesministerium für Gesundheit und soziale Sicherung, 2005), we divided the mothers into groups with an income below and above the poverty threshold. The educational level was determined by the number of school years the mothers had completed.

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