



## Research report

# Parental feeding practices and associations with child weight status. Swedish validation of the Child Feeding Questionnaire finds parents of 4-year-olds less restrictive <sup>☆</sup>



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## ABSTRACT

The Child Feeding Questionnaire (CFQ) assesses parental feeding attitudes, beliefs and practices concerned with child feeding and obesity proneness. The questionnaire has been developed in the U.S., and validation studies in other countries are limited. The aim of this study was to examine the psychometric properties of the CFQ in Sweden and the associations between parenting practices and children's weight status. Based on records from the Swedish population register, all mothers of 4-year-olds ( $n = 3007$ ) from the third largest city in Sweden, Malmö, were contacted by mail. Those who returned the CFQ together with a background questionnaire ( $n = 876$ ) received the CFQ again to enable test-retest evaluation; 564 mothers completed the CFQ twice. We used confirmatory factor analysis to test whether the original 7-factor model was supported. Good fit ( $CFI = 0.94$ ,  $TLI = 0.95$ ,  $RMSEA = 0.04$ ,  $SRMR = 0.05$ ) was obtained after minor modifications such as dropping 2 items on restriction and adding 3 error covariances. The internal reliability and the 2-week test-retest reliability were good. The scores on restriction were the lowest ever reported. When the influence of parenting practices on child BMI (dependent variable) was examined in a structural equation model (SEM), child BMI had a positive association with restriction and a negative association with pressure to eat. Restriction was positively influenced by concern about child weight. The second SEM treated parenting practices as dependent variables. Parental foreign origin and child BMI had direct effects on restriction, while pressure to eat was also influenced by parental education. While the results of the study support the usefulness of the CFQ in Sweden, carefully designed cross-cultural comparisons are needed to explain why the levels of restrictive feeding in Swedish families are the lowest reported.

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**Abbreviations:** BMI, Body Mass Index; CN, Concern about child weight (CFQ factor); CFA, Confirmatory Factor Analysis; CFI, Comparative Fit Index; CFQ, Child Feeding Questionnaire; MLR, Maximum Likelihood with Robust standard errors estimation; MN, Monitoring (CFQ factor); NNFI, Non-normed Fit index; PCW, Perceived Child Weight (CFQ factor); PE, Pressure to Eat (CFQ factor); PPW, Perceived Parent Weight (CFQ factor); PR, Perceived Responsibility (CFQ factor); RMSEA, Root Mean Square Error of Approximation; RST, Restriction (CFQ factor); SD, Standard Deviation; SEM, Structural Equation Modeling; SRMR, Standardized Root Mean Square Residual; TLI, Tucker–Lewis Index.

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## Introduction

The Child Feeding Questionnaire (CFQ) is one of the most well-known and frequently used psychometric instruments worldwide to assess parental feeding attitudes, beliefs and practices concerned with child feeding and obesity proneness (de Lauzon-Guillain et al., 2012; Vaughn, Tabak, Bryant, & Ward, 2013). However, assessments of measurement invariance in new populations have nearly always been performed in English-speaking countries. Of the studies using confirmatory factor analysis (CFA), a method of choice when assessing whether a predefined factor structure fits the empirical data (Anderson, Hughes, Fisher, & Nicklas, 2005; Birch et al., 2001; Corsini, Danthiir, Kettler, & Wilson, 2008; Geng et al., 2009; Kaur et al., 2006), only one has been performed in a non-English speaking country, namely in Japan (Geng et al., 2009). Thus, in spite of almost 15 years of use in multiple settings, knowledge about the cross-cultural equivalence of the CFQ is limited. Although not all studies have been able to document differences in parenting based on ethnicity, few behaviors have been deemed so culturally-sensitive as parenting practices (Bornstein, 2012; Cullen et al., 1999; Seth et al., 2007; Spruijt-Metz, Li, Cohen, Birch, & Goran, 2006). A number of recent review papers have urged researchers to conduct careful evaluations of parenting questionnaires when introduced into new ethnic or national settings (Baranowski et al., 2013; de Lauzon-Guillain et al., 2012; Musher-Eizenman & Kiefner, 2013; Vaughn et al., 2013).

Sweden is of particular interest when testing the cultural-equivalence of parenting measures because one might expect to find lower prevalence of restrictive parenting behaviors. Although not scientifically demonstrated, Swedish parenting culture might be linked to a child-centered responsive parenting style, which has famously been described in Astrid Lindgren's books about Pippi Longstocking. A responsive parenting style and less restrictive feeding practices have been associated with healthy weight development in children (Gerards, Sleddens, Dagnelie, de Vries, & Kremers, 2011; Sleddens, Gerards, Thijs, de Vries, & Kremers, 2011; Vollmer, 2013). In Sweden, the prevalence of obesity among children is lower than in most countries in Europe (Pigeot et al., 2009; Wijnhoven et al., 2013) and has been stable since 2000 (Rokholm, Baker, & Sorensen, 2010).

Previous validation studies of the CFQ (Anderson et al., 2005; Birch et al., 2001; Corsini et al., 2008; Geng et al., 2009; Kaur et al., 2006) have shown that several items from the original questionnaire were problematic in the various populations tested; competing factor structures have been proposed. Thus, the first purpose of this study was to evaluate and compare how these different structures would fit our Swedish data. The second purpose of our study was to examine test-retest reliability, as research on the temporal stability of the CFQ is limited (Vaughn et al., 2013). The third purpose of our study was to examine associations between child BMI and parenting in two different models. In the first structural equation model (SEM) we examined the influence of parenting practices on child BMI (dependent variable), and in the second model we chose restriction and pressure to eat – the parenting practices most often associated with high BMI in children (Faith & Kerns, 2005) – as dependent variables. We anticipated that high child BMI would be associated with certain parenting practices, such as restriction. In the second model we hypothesized that parental characteristics would have an impact on parenting practices; for example that restrictive feeding practices would be less often reported by parents born in Sweden who had a high education level. The link between parental education (a usual proxy for socioeconomic status) and childhood obesity is well established (Shrewsbury & Wardle, 2008; Sobal & Stunkard, 1989), even in Sweden (Lakshman et al., 2013), starting already at infancy (Svensson et al., 2014).

In sum, this study will demonstrate whether the psychometric properties of the translated CFQ will justify the future use of the CFQ in Sweden and clarify the associations between parenting practices and children's weight status, adjusting for potential confounders. Thus, this study will fill the gap in knowledge by providing additional evidence on whether questionnaires on parental feeding practices can be used across different cultures, whether they are time-invariant and whether independent associations between parenting and child weight exist. Increased understanding of modifiable familial determinants of child weight status, both universal and cultural-specific, is vital for the development of effective lifestyle interventions.

## Methods

### Description of factors in the CFQ

The CFQ has been developed to assess parents' perceptions and concerns regarding child obesity, child-feeding attitudes and practices (Birch et al., 2001). It consists of 31 items, loading on 7 factors. Four factors assess parents' perceptions of child and parent weight, as well as concerns about weight; thus, they assess cognitions that may influence parental control in feeding situations. The first factor is Perceived Responsibility (PR), consisting of 3 items assessing parents' perceptions of their responsibility for child feeding, namely:

- (PR1) When your child is at home, how often are you responsible for feeding her?
- (PR2) How often are you responsible for deciding what your child's portion sizes are?
- (PR3) How often are you responsible for deciding if your child has eaten the right kind of foods?

The response options for these items are: 1 = never, 2 = seldom, 3 = half of the time, 4 = most of the time, 5 = always.

The second factor is Perceived Parent Weight (PPW), consisting of 4 items that assess parents' perceptions of their own weight status history, namely during:

- (PPW1) Your childhood (5–10 years old)
- (PPW2) Your adolescence
- (PPW3) Your 20s
- (PPW4) At present

The response options for these items are: 1 = markedly underweight, 2 = underweight, 3 = normal, 4 = overweight, 5 = markedly overweight.

The third factor is Perceived Child Weight (PCW), consisting of 5 items assessing parents' perceptions of their child's weight status history, namely during:

- (PCW1) Your child during the first year of life
- (PCW2) Your child as a toddler
- (PCW2) Your child as a preschooler
- (PCW3) Your child from kindergarten through 2nd grade
- (PCW4) Your child from 3rd through 5th grade
- (PCW5) Your child from 6th through 8th grade

The response options are the same as for the previous factor, PPW.

The fourth factor is parents' Concern about Child Weight (CN), consisting of 3 items that assess parents' concerns about the child's risk of being overweight, namely:

- (CN1) How concerned are you about your child eating too much when you are not around her?

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