



Prevalence and correlates of picky eating in preschool-aged children: A population-based study



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ABSTRACT

Objective: The present study, conducted with a population-based preschool children sample, aimed to examine the prevalence rates of picky eating according to the presence of the avoidance or restriction of food intake, searching for picky-eating correlates.

Methods: 959 children from 1.5 to 6 years old were evaluated by their parents and caregivers/teachers. Picky eating was assessed by CBCL 1.5–5 and C-TRF, following Cano et al.'s (2015) procedure.

Results: The prevalence of picky eating was 25.1%. The comparison of the picky-eating group and the non-picky-eating group indicated that picky eating was more common in older children and in children from lower-income families with younger parents. Significant associations were found between picky eating, pregnancy and birth delivery complications. Emotional and behavioral problems were also found to differentiate picky eaters and non-picky eaters using DSM-5-oriented subscales. The results of a binary logistic regression analysis revealed that children with somatic complaints and attention problems were more likely to be picky eaters.

Discussion: Picky eating in preschool children should be considered together with sociodemographic features, pregnancy and delivery issues, and the presence of emotional and behavioral problems. Our results support the possibility that picky eating, as a specific eating pattern, could also be part of a broader pattern of behavioral problems in children.

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1. Introduction

Feeding problems in children are common (Bryant-Waugh, Markham, Kreipe, & Walsh, 2010) and are characterized by parental perception of poor appetite, fussiness or picky eating, and the exhibition of problematic food refusal behaviors. Approximately 25–45% of normally developing children and up to 80% of developmentally delayed children are reported to experience some type of feeding problems (Linscheid & Murphy, 1999; Ramsey, Gisel, McCusker, Bellavance, & Platt, 2002; Sadock & Kaplan, 2007). For most families, feeding problems are acute and the resolution of these difficulties is rapid; however, for a significant number of families, feeding problems can become chronic, with potentially serious growth and health consequences (Budd et al., 1992).

Picky-eating descriptions expand from picky eating itself to selective eating and sensory food aversion (cf. Bryant-Waugh, 2000, Cano, Hoek & Bryant-Waugh, 2015, Chatoor, 2002, Chatoor, Hirsch, Ganiban,

Persinger, & Hamburger, 1998). According to Jacobi, Schmitz, and Agras (2008), picky eating characterizes children who reject certain types of foods or groups of foods that parents think are appropriate or necessary for the child's development. Picky eating is also associated with longer feeding times or lengths of meals, lower nutritional variety and a more limited total number of foods consumed, and strong preferences concerning food presentation and preparation. This condition often leads parents to provide their child a meal different from the rest of the family (Mascola, Bryson, & Agras, 2010) resulting in a diet characterized by a low variety of foods and few vegetables and fruits (Dovey, Staples, Gibson, & Halford, 2008; Galloway, Fiorito, Lee, & Birch, 2005; Galloway, Lee, & Birch, 2003; van der Horst, 2012). Only extreme variants of picky eating that are associated with clinically significant distress or impairment to development or functioning may meet diagnostic criteria for Avoidant Restrictive Food Intake Disorder (Cano, Hoek, et al., 2015).

As stated by some authors, picky eating is a relatively common problem in childhood, ranging from 8% to 50% in different samples (e.g., Mascola et al., 2010; van der Horst, 2012) and from 14% to 50% in early childhood (cf., Cano, Hoek, et al., 2015). Carruth, Ziegler, Gordon, and Barr (2004) conducted a study with a national random sample of 3022 infants and toddlers from 4 to 24 months

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of age (living in the 50 US states and the District of Columbia). They concluded that the prevalence of children perceived as picky eaters was evident for both genders and all ages, ethnicities, and household incomes increasing from 19% to 50% from four to 24 months of age. Concurrently, [Mascola et al. \(2010\)](#) found that the incidence of picky eating was highest in early childhood, declining to very low levels by 6 years of age. The authors also found that over half of all picky eaters recover over a 2-year period, irrespective of age of onset; they concluded that the onset of picky eating largely occurs in early childhood and that the majority of cases are of short duration. In a recent cohort study about picky-eating trajectories in childhood, [Cano, Tiemeier, Hoeken, Tharner, Jaddoe, et al. \(2015\)](#) found that picky-eating prevalence was from 26.5% at 1.5 years of age, 27.6% at the age of 3 and 13.2% at 6 years. The authors concluded that the prevalence of picky eating was highest at 3 years of age and lowest at 6 years of age and that almost two-thirds of the early picky eaters remitted within 3 years (cf. [Cano, Tiemeier, et al., 2015](#)).

The presence of pregnancy and partum correlates among picky eaters and non-picky eaters has also been studied. Feeding problems seem to be more prevalent in children with low birth weight (10–49%; [Stern, Karraker, McIntosh, Moritzen, & Olexa, 2006](#)) and prematurity (58%; [Cerro, Zeunert, Simmer, & Daniels, 2002](#)). Some authors suggest that the beliefs and perceptions about infant vulnerability and fragility among mothers of children born prematurely can affect mother-infant interactions and infant outcomes ([Stern et al., 2006](#)). [Galloway et al. \(2003\)](#) also concluded that picky eaters were breastfed for fewer than 6 months and that picky eaters' mothers had less variety in their vegetable intake and perceived their family to have little time to eat healthful foods. Breastfeeding and the introduction of complementary foods after 6 months of age was found to reduce the odds of picky eating in early childhood ([Shim, Kim, Mathai, & The Strong Kids Research Team, 2011](#)). However, there is a paucity of research findings about the associations between pregnancy, partum and picky eating, highlighting the need for more studies in this field.

Moreover, some authors support that children with feeding difficulties are at risk for a variety of both short and long-term problems ([Budd et al., 1992](#)) such as severe weight loss, lethargy, aspiration, malnutrition, and unpleasant mealtime environments. Regarding emotional and behavioral problems, there are no studies available that focus on preschool-aged children with picky eating behavior. Additionally, the relationship between picky eating and other eating disturbances in childhood is not clear. Relying on studies conducted with older children, [Jacobi et al. \(2008\)](#) found no relationship between picky eating in 8- to 12-year-old children and specific symptoms of disturbed eating (such as dieting, binge eating, feeling fat or weight-control behaviors). Rather, the authors supported that picky eating is related to a variety of behavioral problems, including both internalizing and externalizing behaviors. The association between picky eating and general psychopathology was already discussed in the results found in other population-based studies. For instance, [Micali et al. \(2011\)](#) conducted a study with a subsample of the Copenhagen Child Cohort 2000 with children from 5 to 7 years old and concluded that picky eating was described as a problem by more than half of parents and was also associated with psychopathology across disorders.

Research has also identified other correlates of picky eating. In a study conducted by [Hafstad, Abebe, Torgersen, and von Soest \(2013\)](#) with children between 1.5 and 4.5 years of age, the authors concluded that lower maternal age, maternal negative affectivity, higher child emotionality and birth order predicted picky eating. More recently, [Cano, Tiemeier, et al. \(2015\)](#) found that lower birth weight and insufficient income were associated with persistent picky eating in children between 2.5 and 4.5 years of age.

Considering the scarce research on picky eating during infancy or early childhood, particularly in relation to the eventual coexistence of emotional and behavioral problems, the present study was conducted with a population-based preschool children sample aiming (1) to

examine the prevalence rates of picky eating according to the presence of avoidance or restriction of food intake, (2) to study the presence of related pregnancy and partum correlates among picky eaters and non-picky eaters, (3) to evaluate the presence of emotional and behavioral problems among picky eaters and non-picky eaters and (4) to evaluate the role of some correlates of picky eating in early infancy such as sociodemographic characteristics, pregnancy and birth delivery, and children's emotional and behavioral problems. We hypothesized that prevalence of picky eating in preschool aged children will be similar to the one found in other studies being also more prevalent in younger children. We also hypothesized that picky eaters differ from non-picky eaters in relation to the presence of pregnancy and partum complications and several emotional and behavioral problems and in respect to sociodemographic characteristics like parental age and family income.

2. Method

2.1. Participants

In this study, 959 children from 1.5 to 6 years old ($M = 3.63$ years; $SD = 1.08$) were evaluated by their parents and caregivers/teachers (781 derived from a population-based sample and 178 derived from a clinical setting). Concerning the population-based sample, a stratified random sample of all children aged between 18 and 60 months-old attending public and private preschool settings in Portugal was used. Stratification was based on children's gender (male vs. female), age (18–30 months vs. 31–60 months), setting (public vs. private), and geographic region (seven regions Nuts II: North, Centre, Lisbon, Alentejo, Algarve, Azores and Madeira). Inclusion criteria: children (aged between 18 and 60 months), who lived with at least one parent. Exclusion criteria: severe mental retardation or other condition (eg. psychosis), psychology or psychiatry referral. Almost 55% of the children were boys ($n = 524$). The mean maternal age was 34.25 years ($SD = 5.01$), and the mean paternal age was 36.83 years ($SD = 5.83$). The majority of the CBCL questionnaire was filled out by mothers (85.9%, $n = 824$). Sixty children (6.8%) were currently or in the past in treatment for behavioral/emotional problems. Socioeconomic status of the participants was determined using an adaptation of the [Graffar Schedule \(1956\)](#). Almost 53% ($n = 488$) came from medium high income to high-income families.

2.2. Measures

2.2.1. Demographic and clinical questionnaire

This questionnaire assesses demographic (family Socioeconomic Status, children's age and gender, and mother's and father's age) and clinical information (pregnancy and partum medical complications, gestational age, type of partum (cesarean birth vs. vaginal birth), birth weight, and mother's emotional and physical problems).

2.2.2. Child Behavior Checklist 1.5–5

The Child Behavior Checklist 1.5–5 (CBCL; [Achenbach, Rescorla, Dias, Ramalho, Sousa Lima, et al., 2014](#)) consists of 99 items that describe behavioral and emotional problems in children of 1.5 to 5 years of age. Parents are requested to rate a child's functioning in the last 2 months on a Likert scale: 0 (not true), 1 (somehow or sometimes true) and 2 (very true or often true). Parents are also requested to provide information about diseases, difficulties, what most concerns the informant in relation to that child and on what best describes the child.

CBCL also provides information on eight empirically based syndromes: emotional reactivity, anxious/depressed, somatic complaints, withdrawn, sleep problems, attention problems, and aggressive behavior. The Portuguese CBCL has been reported to have good reliability and validity (cf. [Achenbach et al., 2014](#)). Furthermore, five subscales based upon DSM-5 age-relevant diagnoses provide

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