

PREGLED LITERATURE – REVIEW ARTICLE

Picky and Fussy Eating in Children

Izbirljiva ishrana dece

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Summary Picky and fussy eating in children (choosy and faddy food choices) is classified in the group of eating and behavioral disorders when a child reluctantly eats already known specific food and/or refuses new foods (food neophobia), as well as a strong tendency to specific food. The consequences can be nutritional deficiencies that affect the health of children, but also the development of obesity. Parents of children who are picky about food state that their children eat monotonous food, that they demand food preparation in a specific way, and there is a prevalence of anger attacks when they are deprived of the food they prefer.

Avoidant restrictive food intake disorder (ARFID) is a newly classified disorder in the "Feeding and Eating Disorders" section of the Diagnostic and Statistical Manual of Mental Disorders. ARFID may be diagnosed only by greater weight loss among some children or by great concern from their parents.

The behavior of children who are picky about food is related to some psychological problems of children, such as isolation, somatic disorders, anxiety and depression, a higher level of aggression, so the question arises as to what is the cause and what is the consequence. One should be careful with picky children, although this behavior decreases with age and does not cause significant nutritional problems, however, the ARFID study warns of individual extreme cases. Prevention of the behavior of picky children is done by offering a variety of foods in early childhood, emphasizing the social value and comfort of the family meal.

Keywords: food neophobia, nutrition, children

Sadržaj Izbirljiva ishrana dece (bezobrazno i ljutito biranje hrane) se klasifikuje u grupu poremećaja ishrane i ponašanja, kada dete nevoljno jede već poznatu specifičnu hranu i/ili odbija novu hranu (neofobija hrane), kao i jaka sklonost ka određenoj hrani. Posledice mogu biti nutritivni deficiti koji utiču na zdravlje dece ali i nastanak gojaznosti. Roditelji navode da njihova deca unose jednoličnu hranu, da zahtevaju pripremanje hrane na specifičan način, nastupaju napadi besa kad im se uskrati hrana koju preferiraju.

Bolest izbegavanja hrane i restriktivni unos hrane (Avoidant restrictive food intake disorder - ARFID) je novo klasifikovan poremećaj u oblasti "Feeding and Eating Disorders" section of the Diagnostic and Statistical Manual of Mental disorders. ARFID je poremećaj ishrane koji uključuje različitu kliničku prezentaciju koja može rezultirati značajnim gubitkom telesne mase, nutritivnim deficitom, dovesti do potrebe za enteralnom ishranom ili dodacima ishrane i/ili znatnom psihosocijalnom disfunkcijom. Pojedina deca s ARFID-om se dijagnostikuje samo pri većem gubitku telesne mase ili kod velike zabrinutosti roditelja.

Ponašanje dece izbirljivih na hrani je povezano sa nekim psihološkim problemima dece kao što su izolacija, somatske smetnje, anksioznost i depresija, veći nivo agresivnosti pa se postavlja pitanje šta je uzrok a šta posledica.

Učestalo i dugotrajno ponašanje izbirljive ishrane može biti simptom kasnijeg poremećaja u ponašanju. Prevencija ponašanja izbirljive ishrane dece se vrši nuđenjem raznolike hrane rano u detinjstvu, potenciranjem društvene vrednosti i ugodnosti porodičnog obroka.

Ključne reči: neofobia hrane, ishrana, deca

Introduction

Picky eating (also known choosy and faddy food choices, PE) is classified in the group of eating disorders when a child reluctantly eats already familiar food and/or refuses new foods, as well as a strong inclination towards certain food. The consequences are nutritional deficiencies that can affect children's health. Preference for certain food and distrust towards new food in infancy in the past have benefited from the possibility of toxin consumption, but in the modern age, this behavior can be detrimental due to nutritional deficiencies.

Joseph Brennemann- Presidential address to the American Pediatric Society- 1930. ; "A nutritional millennium seemed at hand. And then a strange thing happened. The child refused to eat. I know of no stranger paradox then this: The better intentioned the home, the better the food, the more precise the application of feeding rules and regulations, the more stubborn the refusal" (1). He noted that the phenomenon was reported exclusively in the homes of the well-off and not, in orphanages where the food was surely worse, suggesting that parent's recent surge of interest in their children's diet was the cause (1).

Parents of PE children say that their children eat monotonous food, that they demand food preparation in a specific way and the food they like and the one they do not like. When children are deprived of the food they prefer, there is the prevalence of anger attacks. Sometimes PE is the main concern of parents throughout childhood.

Skinner's study concluded that the number of foods that children refuse has increased significantly, the number of newly tried foods has decreased significantly. This study proves that there is a constant and strong influence of mothers on food choices in their children and that a large percentage of children's food preferences are formed when they are 2-3 year old (2).

Picky eating in children - Children limit the intake of familiar foods and do not want to try new foods. Also, children reduce intake of meat, vegetables, fruits, and other "healthy" foods and prefer certain foods (like/dislike), with special preparation or the appearance of food (color, smell, texture) just approaching the dish (3).

Food neophobia - fear of trying new foods: children who are usually aged 18-24 months refuse to try new foods. Food neophobia is more common in children than in adults. If people from the child's environment take new food, the child will also eat new food. The postabsorptive effect is important to overcome neophobia (energy-dense foods) (1,4).

PE includes a lack of varied food intake, neophobia, and persistent PE behavior: refusing to eat familiar foods or trying new foods, so serious and daily, to the extent that it leads to a problematic parent-child relationship.

Conducting the literature review we found the following synonyms for picky eating in children: 'picky eating', 'picky eater', 'picky', 'fussy eating', 'fussy eater', 'fussy', 'fussiness', 'choosy', 'choosiness', 'neophobia', 'slow eating' and 'slow eater'.

There is no single widely accepted definition of picky eating, although most definitions include an element of restricted intake of familiar foods, sometimes with a further degree of food neophobia (5). A review of the literature found several definitions, such as:

- Picky eating is consumption of an insufficient amount or inadequate variety of food through rejection of food items (6).
- Picky eating is limited number of food items in the diet, unwillingness to try new foods, limited intake of vegetables and some other food groups, strong food preferences, and special preparation of foods required (3).

Some studies have developed definitions from the corner of picky eating from analysis of responses to questions on eating behavior. Tharner et al. used a latent profile approach with data from the Child Eating Behaviour Questionnaire (CEBQ) to identify a fussy eating profile comprising high food fussiness, slowness on eating and high satiety responsiveness, combined with low enjoyment of food and food responsiveness (7). "Flags" for identification of picky eaters are: child eats only preferred food, drinks most of his/her energy intake, uses distractions when eating, eats food camouflaged in other foods or liquids, and has lengthy mealtimes (8).

Avoidant/restrictive food intake disorder –ARFID

Picky eating is not synonymous with Avoidant/Restrictive Food Intake Disorder (ARFID; previously known as Selective Eating Disorder). ARFID is a newly classified disorder in the field of "Feeding and Eating Disorders" ("Eating Disorders"), which has a very certain definition in the Diagnostic and Statistical Manual of Mental Disorders (9). ARFID is an eating disorder that involves a heterogeneous clinical picture that can result in significant weight loss, nutritional deficiencies, enteral nutrition or dietary supplements, and/or psychosocial dysfunction. ARFID may be diagnosed among some children only by greater weight loss or high parental concern (9).

Furthermore, eating disorders cannot be explained by a lack of food or an association with certain cultural eating habits. If an eating disorder occurs as part of another eating disorder or disease, the severity of the eating disorder goes beyond routine protocol and requires additional clinical research.

Three subgroups identified corresponding to distinct motivations for food avoidance, each with distinct associated features (1):

- A) Those with limited intake associated with lack of interest in eating/poor appetite
- B) Those with limited variety associated with the sensory features of eating (smell, flavor, texture),
- C) Those whose avoidance of eating had occurred in response to a specific traumatic event. (choking, vomiting)

Those in grup B have the longest length of disease and 20% aprox. have a mixed presentation (1).

ARFID may represent a worsening of food avoidance that crosses a threshold of impairment against a backdrop in which adequate intake or intake of optimal quality had been substandard for a long duration (stressed by periods of growth spurt such as adolescence). Furthermore, patients with ARFID were found to have a greater likelihood of comorbid medical and/or psychiatric illness. Patients with ARFID have higher rates of obsessive compulsive disorder, generalized anxiety, autism spectrum disorder, attention-deficit/hyperactivity disorder, learning disorders, and cognitive impairment (10).

Childrens' eating behavior questionnaire -CEBQ

There are several questionnaires available to identify picky eating, designed for completion by the parent/carer, in which multiple aspects of the child's feeding behaviour are assessed. Some of these questionnaires are the Children's Eating Behavior Questionnaire (CEBQ), the Child Feeding Questionnaire, the Lifestyle Behaviour Questionnaire, the Stanford Feeding Questionnaire and the Preschooler Feeding questionnaire (11).

The Child Eating Behavior Questionnaire-CEBQ is one of the most comprehensive questionnaires to assess children's

eating behavior. It covers a wide range of behaviors that have been described previously in relation to fussy eaters, such as refusal to eat new foods, but also addresses more general problematic eating behavior, food avoidance, as well as the opposite, i.e. food approaching behaviors. The questionnaire includes six styles of eating: fussy, avoidant, moderate, responsive, joyful, approaching combined with food responsiveness, enjoyment of food, satiety responsiveness, food fussiness, enjoyment of food, satiety responsiveness, food fussiness, slowness in eating (1,7).

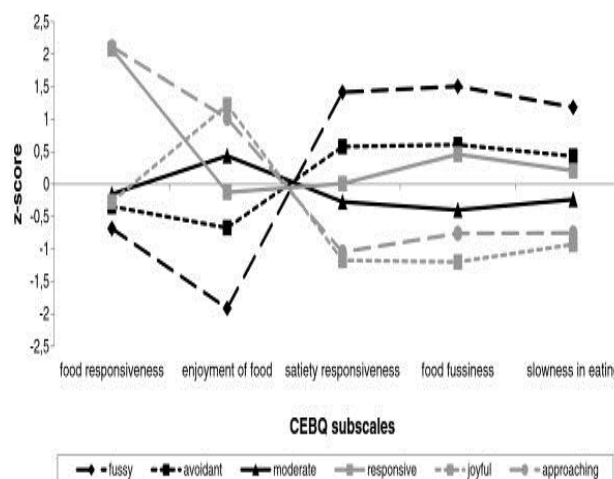


Figure 1. Child eating behavior questionnaire mean subscale scores (z-standardized) in different eating behavior profiles (7).

Figure 1 shows the pattern of CEBQ scores, by Tharner's study, for each of the six identified eating behavior profiles, among which a distinct "fussy eater" profile. The "fussy eater" profile is characterized by a pattern of high scores on food avoidance scales (SR, FF, SE) in combination with low scores on the food approach scales, in particular low enjoyment of food. Fussy eaters scored almost 1SD below the mean on FR, and even 2SD lower on EF, and about 1.5 SD higher than the mean on the food avoidance scales (SR, FF, and SE) (7).

Studies from ALSPAC (a longitudinal population study investigating the impact of the environment and genetics on children's health, behavior and development) have used a single question asking whether the child has definite likes and dislikes for food, with the responses 'No/Yes, quite choosy/Yes, very choosy' (11).

Prevalence and incidence

Since infants (up to 1 year of age) face food tastes and textures for the first time, they are too small to experience neophobia, and studies (or parts of studies) dealing with infants' PE are excluded from considering the frequency and consequences of PE.

Estimates of the prevalence of picky eating range widely from 5.6% in 4-year-olds in the Netherlands (7) to 50% in 2-year-olds in the USA (12). A prevalence of 59% was

reported in 7–12-year-old Chinese children, but the category was inflated by the inclusion of children who were 'somewhat picky' as well as those who were 'always picky' (13). In ALSPAC prevalence was 10% at age 24 months, peaking at 38 months (15%) and then declining at 54 and 65 months (14% and 12%, respectively). Other studies have also found the peak age to be at about 3 years old (11).

A Mascola study shows that 13-22% of children are picky about eating. The incidence decreases with age but the prevalence increases because PE is a chronic problem that lasts more than 2 years in 40% of children (14). Manifestation of food rejection symptoms differs between those with longer duration and those with shorter duration who have more pronounced cravings, rejection of already tried and untested food (Figure 2).

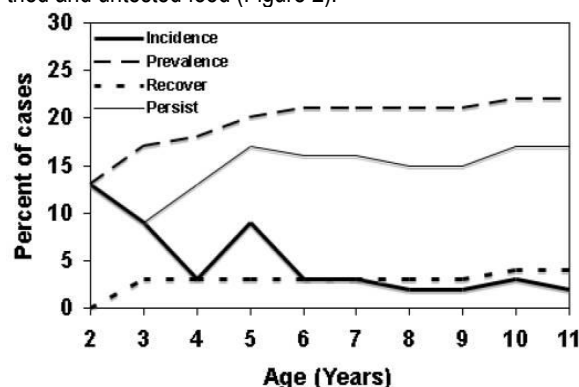


Figure 2. Point prevalence and incidence of picky eating from 3-11 years of age expressed as percentages, rates per 100 children by the Mascola study (14).

PE affects both sexes equally, girls and boys (15), the presence of siblings reduces the incidence of PE; in PE children born to older mothers (7), and healthy maternal nutritional protocols reduce the incidence of PE in their children (16). Food neophobia shows variable heredity in humans. The study of Knaapila shows about two thirds of variation in food neophobia is genetically determined (17).

Etiology

Causes of PE may include food pressure, parental personality factors, feeding style, including parental control and social impact, absence of exclusive breastfeeding, intake of complementary foods before 6 months, and late introduction of solid foods (11). It has been shown that PE is associated with a shorter duration of breastfeeding and an earlier intake of non-dairy foods. One study showed a positive correlation between breastfeeding for less than 6 months and PE in seven-year-old girls (18).

Parental feeding practices are thought to play a causal role in shaping a child's fussiness. Highly controlling "non-responsive" parental feeding practices have been cross-sectionally associated with greater fussy eating in a number of studies but it is not possible to determine the direction of effects from these findings. Study of Holly show within-pair differences in 'food fussiness' were associated with differential 'pressure to eat' and 'instrumental feeding', but not with 'restriction'. Between-family analyses indicated that

'pressure to eat' and 'instrumental feeding' were positively associated with 'food fussiness', while 'restriction' was negatively associated with 'food fussiness' (19).

Maternal anxiety during pregnancy and during the child's preschool period was related to higher food fussiness sum-scores in children. Mothers' depressive symptoms were associated with fussy eating behaviour in their children.

Largely similar associations were found between fathers' internalising problems and children's fussy eating. Fathers' anxiety during the antenatal period was not related to child fussy eating researched by a Lisanne Barse study (20).

Food rejection behaviors such as picky eating is a major parental concern and attempts to increase healthy food intake can cause distress at mealtimes. The topic of many studies is the association between picky eating, child eating characteristics, and food intake among, so many studies have analyzed the differences in food group intake between picky and non-picky eaters. Picky eaters were more likely to be neophobic, texture resistant, and to eat only favorite foods, and neophobia, eating only favorite foods and difficulties with texture are all important characteristics of picky eaters. Food intake of picky eaters differs only slightly from non-picky eaters (3).

Some studies have examined the effects of the appearance of a food portion on food acceptance and consumption. Although taste is an important factor regulating food intake, in most cases, the first sensory contact with food is through the eyes. Several sensory cues affect food intake including appearance, taste, odor, texture, temperature, and flavor. Wadher's research showed that the various visual factors associated with food such as proximity, visibility, color, variety, portion size, height, shape, number, volume, and the surface area have an impact on food acceptance and consumption (21).

Picky eating and behavior problems

A Jacobi et al study shows picky children displayed more problem behaviors comprising both internalizing and externalizing behaviors, isolation, somatic complaints, anxiety and depression, higher level of aggressiveness (22). On the other side persistent PE may be a sign of pervasive developmental problems, but is not predictive of other behavioral problems. Remitting PE was not associated with adverse mental health outcomes, which further indicates that it may be part of normal development (23).

Picky eating and nutritional intake

Picky eaters, more than neophobic, choose a certain food texture and eat only their favorite foods. The more parents offer new food to the child, the more the child chooses certain foods. PE consume fewer eggs, meat, and other sources of protein, less vegetables. PE have a special aversion to vegetables, mostly raw, (boys more than girls) and greater selectivity of vegetables (hereditary trait), of vegetables prefer: french fries, mashed potatoes, and bananas from fruits. They do not like meat and fish, as well as mixed dishes (spaghetti, ravioli, lasagna) (24).

Children who we later label as PE, at the age of 14 months, eat less whole grain products, fewer vegetables, less fish/seafood and less meat than those children who were later identified as nonPE. The intake of salty snacks and sweets was higher in PE, although there was no difference in total energy intake, which suggests that these foods replace "healthy" foods. These differences may be an early sign of PE or could lead to PE at a later age (7).

Carruth et al. conducted a 24-hour survey of a group of children (4–24 months) in the USA, and found no significant differences in the consumption of major food groups between PE and nonPE children, including milk and dairy products. However, PEs consumed fewer unsweetened and sweetened cereals than nonPE children aged 15 to 24 months (12). The Klazinevan der Horst study confirmed that the average food intake of PE and nonPE differs slightly, and such behavior of children can be considered part of the normal development of childhood (3).

Nutritional consequences

The Dubios study shows reduced energy, fat and protein intake in PE children. The intake of vitamins E, Ca and Mg was below the recommended American norms, both in PE children and in nonPE children, but the intake of vitamin E and folate was significantly lower in the PE group compared to the nonPE group (24).

Concerning gender, PE girls were found to consume less energy between the ages of 3.5 and 5.5 years, in contrast to boys (22), and in 9-year-old girls there was no significant difference in protein intake between PE and nonPE children, but there is a significant difference for the intake of vitamin E and folate (lower intake in PE children), in boys PE and nonPE has no statistical significance (18).

The study by Carruth et al. found that intakes of Ca, Zn, vitamin D, and vitamin E were below the recommended intakes for U.S. children and PE children and nonPE children, but that there were no significant differences between the two groups (12).

Research on the intake of whole grains and vegetables, and consequently dietary fiber conducted through several studies, concluded that PE children consume significantly lower dietary fiber compared to nonPE children. It was also found that constipation is constantly associated with PE behavior in children aged 4 (7, 25, 26).

Managing fussy and picky eaters and their parents (adapted from Canadian Pediatric Society (27))

- Reassure parents that a decrease in appetite is normal for children two to five years of age and that their food consumption moderates to match a slower rate of growth.
- Parent is responsible for "what", "where" and "when" the child eats (encouraging variety and flexibility) and the child is responsible for "whether" and "how much" he eats.
- Offer initially, a small portion of each food at meals. A general rule of thumb is to offer one tablespoon of each

food per year of the child's age and to serve more food according to the child's appetite.

- Snacks should not be offered if the timing or quantity of snacking will interfere with the child's appetite for the next meal. Snack foods that are dense in nutrients (and not energy) should be chosen.
- Juice should not be offered as a part of the snack. Children should NOT be allowed to snack throughout the day or to drink an excessive amount of milk or juice; both practices lead to eating less at mealtimes.
- Always present a new food with one already known and never hide a new food in a familiar one. Allow the child to see the same food repeatedly, even touching it before tasting. Separate food in the dish, with spaces between them and try diverse colors.
- Encourage family meals with the child. Remind parents that eating should be an enjoyable activity.
- Children should not be coerced or even coaxed to eat. Threats or punishments have no role in healthy eating.
- Distractions such as toys, books or television at the table should not be permitted during mealtimes.
- Child's time at the table should generally be limited to about 20 min. When mealtimes is over, all food should be removed and only be offered again at the next planned meal or snack.
- To stimulate appetite, children need exercise and play. However, they are less likely to eat well when they are tired or overstimulated. A 10 min to 15 min notice before any meal helps children to prepare and settle down before eating.
- Vitamin or mineral supplements can be used if the quality of the diet is questionable. When a child is growing well there is no need for nutritional supplements. (27)

Conclusion

We are not born neophobic, but food neophobia is part of a child's life trajectory. Preventing Picky Eater behavior is easier than correcting it, through encouraging early food variety, and the social value and pleasantness of family mealtime. Picky eater behavior tends to attenuate with age, and does not normally cause relevant nutritional problems, but checking for ARFID criteria is warranted in more extreme cases. Persistent and long lasting Picky Eater behavior may be a symptom of a pervasive behavior disorder.

Abbreviations

PE – picky eaters
 nonPE – non picky eaters
 ARFID - Avoidant/Restrictive Food Intake Disorder
 CEBQ - Children's Eating Behavior Questionnaire
 FR - food responsiveness
 EF - enjoyment of food
 SR - satiety responsiveness
 FF - food fussiness
 SE - slowness in eating

SD - standard deviation

ALSPAC - Avon Longitudinal Study of Parents and Children

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