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Picky Eaters: A Review of Their Food Aversions

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I. Introduction

Prior studies have identified food aversion, eating behaviors and dietary habits as becoming high priority cases amongst parents, healthcare professionals and governing bodies. According to Ramsay et al (2002) 25% to 50% of children are affected by feeding problems. These problems range from relatively minor mealtime problems such as being fussy and picky eaters to food refusal which could lead to life threatening situations (Luiselli 1989). Galloway et al (2005) define picky eating as the consumption of “inadequate variety of food”. Many parents complain about their children being picky eaters (Mascola et al 2010). It is not only the child who is affected through picky eating and food aversion. Parents of these children are greatly affected due to the significant amount of anxiety and stress that it creates. Cardona Cano et al (2015) state that this occurs as parents find it difficult to teach their children healthy eating behaviors. It is extremely important to teach healthy heating behaviors as theses dietary patterns established in childhood and continue to develop well in to their adulthood (Mikkilä et al 2005). Boquin et al (2014) found that there are two main characteristics of picky eating that parents describe, the first of which is the limited consumption of the type (variety) and amount of food (quantity) and the second is trying new foods. Nederkoorn et al (2015) also identify that picky eaters display undesirable reactions to the sensory properties of food such as texture and aroma.

II. Discussion

Eating Habits

Eating habits have been associated with an increased risk of being underweight (Dubois, Farmer, Girard, Peterson, and Tatone-tokuda, 2007), and overweight (Faith &Hittner, 2010), as well as a deficiency of important vitamins and fiber in children's diet (Galloway, Lee, and Birch, 2003). Early eating problems may also establish a risk for developing more serious eating disorders in adolescence, such as anorexia nervosa (Marchi and Cohen, 1990).

A number of cross-sectional studies have shown individual factors, such as low birth weight (Dubois et al., 2007), negative affectivity and difficult temperament (Haycraft, Farrow, Meyer, Powell, and Blissett, 2011; Jacobi, Agras, Bryson, and Hammer, 2003), to be correlated with picky eating. Environmental concomitants – factors of picky eating, such as low maternal age, parental financial problems and maternal negative affectivity, have also been identified (Dubois et al., 2007; Jacobi et al., 2003).

Only one prospective study has examined factors predicting picky eating in preschool children longitudinally. This study showed that infants with a lower sucking frequency during breastfeeding were significantly more

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likely to be picky eaters at ages 2, 3 and 5 years (Jacobi et al., 2003). The findings also indicated older siblings may affect the presence of picky eating; boys who had older siblings were less likely to be picky eaters, whereas girls with older siblings had a higher risk of being picky eaters at the age of 5 years (Jacobi et al., 2003).

The finding that the child's emotionality was a longitudinal predictor of picky eating supports the reasonably well-established association between a difficult temperament and problematic eating behavior in young children (Haycraft et al., 2011; Jacobi et al., 2003)

Another study showed that mother's negative affectivity at an early point in the child's life has implications of later development of the child's eating patterns, which is in accordance with results from cross-sectional studies showing such a link (Blissett, Meyer, and Haycraft, 2007).

There is also research showing that maternal anxiety influences the mother's sensitivity to the child in feeding situations, and may therefore lead to more controlling feeding practices in infancy (Micali, Simonoff, and Treasure, 2010).

Only one other study has so far examined the influence of having siblings on picky eating, finding that cross-sectionally there was an interaction between gender and older siblings (Jacobi et al., 2003).

Children's eating behaviors, attention or the feeling of being pressured to eat may increase pickiness (Blissett et al., 2007; Galloway et al., 2005).

Picky Eaters

Picky eating is a term used to cover a broad set of behavior issues without a concise definition (Boquin, Moskowitz, Donovan, & Lee, 2014; Jacobi, Schmitz, &Agras, 2008). Picky eating, i.e. the consumption of an inadequate amount or variety of food through rejection of food items (Galloway, Fiorito, Lee, and Birch, 2005; Lewinsohn et al., 2005), that affects children's nutritional status and weight and may thus constitute a significant health concern. Another definition; Picky eating in children is usually described as the child having strong food preferences, consuming an inadequate variety of foods, restricting the intake of some food groups, eating a limited amount of food, or being reluctant to try new foods. Picky behaviors were eating a limited variety of foods, wanting the food prepared in specific ways, not accepting new foods readily, and having strong dislikes.

Picky eating is a relatively common problem during childhood ranging from 8% to 50% of children in different samples and is characterized by the toddler or child eating a limited amount of food, limiting consumption particularly of vegetables, being reluctant to try new foods, and having strong food preferences often leading parents to provide their child a meal different from the rest of the family (Carruth et al., 1998; Carruth, Ziegler, Gordon, & Barr, 2004; Dubois, Farmer, Girard, Peterson, &Tatone-Tokuda, 2007; Dubois, Farmer, Girard, & Peterson, 2007; Jacobi, Schmitz, &Agras, 2008; Lewinsohn, Holm-Denoma, Gau, Joiner, &Striegel-Moore, 2005; Marchi& Cohen, 1990).

A few studies cover only one or a few characteristics of picky eating behaviors due to the absence of a single definition of picky eating (Taylor, Wernimont, Northstone, & Emmett, 2015).

Two main eating characteristics that parents use to define their picky eating child are: reluctance to try new foods and consuming a limited type and amount of food (Boquin, Moskowitz, et al., 2014; Jacobi et al., 2003).

Some studies use a single item to measure picky eating, not covering any of the picky eating characteristics (Carruth et al., 2004), while other studies use a series of questions that address several aspects of picky eating, such as the fussiness subscale of the Child Eating Behavior Questionnaire (Wardle, Guthrie, Sanderson, &Rapoport, 2001).

A similar need for consensus on the definition of picky eating and improvement of assessment tools as this has led to the wide variation in the definition of picky eating in studies with limited comparability (Lafraire, Rioux, Giboreau, & Picard, 2015; Taylor et al., 2015). It may be possible to shape down picky eating by relatively simple actions, such as not allowing grazing and presenting rejected foods for tasting at least six times or more (Caton et al., 2013; Caton et al., 2014).

A few studies focus solely on neophobia, which is one aspect of picky eating (Birch, McPhee, Shoba, Pirok, & Steinberg, 1987; Cooke, Carnell, & Wardle, 2006; Cooke et al., 2003; Coulthard Thakker, 2015).

Family Side Effects

Preschool children carry the most common trait of being picky eaters and neophobia (Cardona Cano et al., 2015; Mascola, Bryson, &Agras, 2010). According to Ong et al (2014) children's eating habits and nutrition has become a high priority concern for parents. It is for this reason that parents of children who are picky eaters seek feeding guidance from professionals that they can implement. Parents of preschool children struggle with feeding their children healthy food, because of the high rate of food rejection behaviors. This causes stress concerns for the family and the child both, the parents eventually start using own strategies which hampers the development of healthy eating habits in children (Galloway, Fiorito, Lee, & Birch, 2005).

Nutritional Differences of Picky Eater and Non-Picky Eaters

Researchers have been trying to find evidence for the nutritional differences between picky eaters and non-picky eaters. However, no such research has been able to be conducted. It is likely, at least as determined from animal models (Reed, 2008), that food intake is in part genetically determined possibly explaining the variation in intake observed between picky and non-picky eaters (Dubois et al 2007; Jacobi et al., 2003).

Intake of Picky Eaters

Snacking behaviors may decrease healthy food consumption in children. As the child may havehad too many snacks in between. This results in the child's stomach being full which further results them not eating their food properly. Different researches have reported different food consistencies taken by the picky eaters. A consistently reported variance in food intake is the lower vegetable intake. (Cooke et al, 2004). Young children do not prefer foods that have textures such as being slimy or mushy or even tough in texture are unlikeable to them. Nederkoom et al (2015) state that raw foods might be more tough to eat for picky eaters as they might have more tactile sensitivity than the non-picky eaters (Nederkoorn et al., 2015).A previous study by Jacobi et al (2003)135 children aged 5 years from the Stanford Infant Growth Study found that picky eaters consumed fewer calories than non-picky children and showed a less dynamic sucking style as an infant, signifying that picky eating has trait-like characteristics. Dubois found that picky eater's intake fewer calories and was twice as likely to be underweight as non-picky eaters.

Food Texture & Sensory Aspects

Food texture is a complex sensory property because it involves different dimensions (structure, mechanical properties and surface) perceived through different senses, such as vision and touch in particular (Szczesniak, 2002). The acceptance of food with a given texture, defines the infant's ability to swallow the food. This is strongly inured by the acquisition of feeding skills, which can develop differently in children of the same age (Carruth& Skinner, 2002).Coulthard et al (2009) states that the introduction of appropriate textures during weaning to early childhood is vitally important to understand and progress to more difficult food. Furthermore, Williams (2013) found that children in their second year of life start to reject foods they initially accepted and will place advanced importance on the physical properties of food such as color and texture. The reason for this could possibly be the experiences with different textures earlier in life that might facilitate infants' acceptance of more complex textures at a later stage (Coulthard, Harris, & Emmett, 2009)

Recent findings from qualitative and quantitative studies on picky eating confirmed that picky eaters display negative reactions to sensory properties of foods, particularly texture and aroma (Boquin, Moskowitz, et al., 2014; Nederkoorn, Jansen, &Havermans, 2015; Russell &Worsley, 2013).In addition to the distinctive reported features of picky eating such as neophobia and favorite food consumption, texture resistance is also significantly linked with picky eating. A current study, confirms the association between texture resistance and pickiness. Tactile sensitivity also plays a role in food acceptance among picky eaters (Boquin, Moskowitz, et al

2014; Nederkoorn et al 2015). Raw foods might be more problematic for picky eaters as they might have more tactile sensitivity than the non-picky eaters (Nederkoorn et al., 2015).

Therefore, recommending the introduction of lumpy texture before 6 months may therefore be considered. It would be helpful for their oral development because it solicits more tongue movements (Mason, Harris, &Blissett, 2005). Together with the chewing behavior, children probably also acquired enough tongue movement to press a food against the palate (Le Reverend et al., 2014; Stevenson &Allaire, 1991).
Sticky and slimy textures were generally not liked by children because of their lack of control over this texture in the mouth (Szczesniak, 2002). Lumpy texture was difficult for children during weaning period and was quite often rejected (Coulthard& Harris, 2003). In precise, it was found that a significant proportion of infants (23%) have difficulties with foods containing pieces (Coulthard& Harris, 2003). Such difficulties seem to be related to insufficient oral skills to separate in the mouth lumps that are big enough to trigger the gag reflex and need to be moved to the side of the mouth, from the rest of the mass that can be swallowed using a liquid swallow (Harris & Mason, 2017).
It is well known that food dimensions do play a role in food acceptance in children (Schwartz et al., 2017). Children prefer food items or consistencies that can be easily manipulated in the mouth and need minimal effort. Preferences for complex textures evolve with age, the older the child gets the easier he finds chewing the food.
By 12 months, munching/chewing behavior is well developed and continues to mature, still gaining in efficiency at 2–3 years. Gisel (1991) investigated the ability of 6- to 24-month-old children to eat foods with different textures: applesauce (puree), viscous orange gelatin and Cheerios cereal. Children became significantly more efficient as they required less time and fewer bites at eating solid food as they grew older and that this efficiency was mastered at different ages depending on the texture studied.
Children who received lumpy foods before the age of 6 months had less feeding difficulties at 18 months and were less fussy than those who received such foods after 10 months (32% vs. 52%) (Northstone et al., 2001).
Texture-related eating strategies have been reported to differ among infants (Gisel, 1991).

Eating Behavior Assessment

Researchers have shown that the use of a more extensive assessment measure on picky eating, for example the Children's Eating Behavior Questionnaire would have given more in-depth analyses of children's eating behaviors as it would also measures acceptance of new foods, a variety of foods and child's difficulty to please with meals.

Complementary Feeding / Weaning Off

Nutritional transition, also known as complementary feeding (CF), is becoming increasingly known for its significance in the development of food preferences and the shaping of healthy and maintainable eating behaviors (Harris &Coulthard, 2016; Harris & Mason, 2017; Schwartz, Vandenberghe-Descamps, Sulmont-Rossé, Tournier, &Feron, 2017). Strategies to familiarize children to complementary foods (Fewtrell et al., 2017; Harris &Coulthard, 2016; Lanigan, Bishop, Kimber, & Morgan, 2001; Nicklaus, 2016) and the importance of the timing of this introduction (Coulthard, Harris, & Emmett, 2009; Northstone, Emmett, Nethersole, & Team, 2001) is well-documented. At the beginning, children process semi-solids (i.e., purees) by sucking because they have only practiced liquid foods (6, Lehtihalmes, Yliherva, & Olsen, 2012).Between 6 and 12 months the most noticeable variations in feeding behaviors occur; the primary sucking-swallowing behavior is gradually replaced by the emergence of chewing and the ability to move solid foods around the mouth for swallowing (Harris &Coulthard, 2016; Nicklaus et al., 2015; Stolovitz Gisel, 1991).
In a further study of over 800 families interviewed on three occasions from 1–10 years, 9– 18 years and 11–21 years picky eating was found to be a risk factor for the development of symptoms of anorexia nervosa (Marchi& Cohen, 1990). A German study of 426 children 8 to 12 years of age found that picky eaters were more likely to exhibit problem behaviors than non-picky eaters (Jacobi et al., 2008).

During early childhood the rates of picky eating remain stable over a two-year period (Dubois, Farmer, Girard, Peterson, &Tatone-Tokuda, 2007) and picky eating has a similar prevalence of 18% and similar characteristics in later childhood (Jacobi et al., 2008) as compared with studies of early childhood. The only prospective study found fairly high correlations and similar prevalence between childhood and adolescent picky eating (Marchi& Cohen, 1990) although this study did not investigate stability of the syndrome.

This study extends our previous findings from a similar cohort from the Stanford Infant Growth study in which children were followed from 2 to 5 years of age (Jacobi et al., 2003).

It assessed the course of picky eating from 2 to11 years. Previous studies have shown that the prevalence of picky eating was relatively stable during early childhood from 2.5 to 4.5 years (Dubois, Farmer, Girard, Peterson, &Tatone-Tokuda, 2007) although findings from this study suggest that the prevalence increases during this period.

III. Food Refusal

Food refusal has been defined and explained in a variety of ways. It has been described as a general term that holds a wide range of a child's feeding problems (Douglas, 2002).A more precise type of feeding problem, defined as a child's refusal to eat all or most foods presented, resulting in the child's failure to meet his or her caloric or nutritional needs (Field, Garland, & Williams, 2003).

Food refusal has also been defined both in terms of reduced appetite (Stainano, 2003) and the specific behaviors often linked with the refusal of food such as head turning and mouth closure depending upon the presentation of food, spitting out food, dawdling, gagging, and even vomiting (Lindberg, Bolin, &Hagekull, 1994).These variations in the definition of food refusal replicate the more general state of the field, where, to date, there is little consensus on defining childhood feeding disorders and no generally accepted organization for childhood feeding disorders (Kedesdy& Budd, 1998).Feeding is a complex process and problems with any stage in the process can result in feeding disorders. It has been recommended that feeding disorders in children are heterogeneous and may include a range of problems including medical, oral motor, and behavioral (Piazza, 2008).

According to Williams, Riegel, &Kerwin, 2009; food refusal, gastroesophageal reflux was found in 53% of the children, while neurological conditions and cardiorespiratory disease were each found in 30% of children. Another study which compared a sample of infants with gastroesophageal reflux disease (GERD) to infants without reflux found the children with GERD had more food refusal and more problems with swallowing (Mathisen, Worrall, Masel, Wall, & Shepherd, 1999).

Food refusal secondary to anatomical anomalies has also been reported by several studies.

Field et al. (2003) reported 14% of the children with food refusal in their sample had anatomical anomalies and these anomalies included tracheoesophageal fistula, cleft palate, and microgastria. The prevalence of feeding problems more generally has been found to be high among children with developmental disabilities, with rates ranging as high as 35% (Dahl &Sundelin, 1986; Palmer & Horn, 1978). This is not surprising given the frequency of medical conditions, especially gastrointestinal problems found among children with developmental disabilities (Sullivan, 2008).

In many of the studies examined for this review, the children who were identified with food refusal were also diagnosed with a developmental disability. Our results revealed that the four most common picky behaviors were eating a limited variety of foods, wanting the food prepared in specific ways, not accepting new foods readily, and having strong dislikes. Children's eating behavior has improved our understanding of the positive relationship between picky eating habits and the impairment of certain types of development in children. The prevalence of picky behaviors was similar to the result of a previous observation reported by Jacobi et al.Parental and caregiver attitudes and interventions were shown to be effective in increasing children's consumption and expressed liking of the disliked foods. A positive social context is considered to be helpful in developing food likes.

Tactile Play

Enjoyment of tactile "messy" play would be linked with children's food acceptance, in particular, higher child fruit and vegetable consumption and lower child food neophobia. The tactile play was associated with lower food neophobia but not child fruit and vegetable consumption. The main association between child fruit and vegetable consumption and the variables measured within this study was with parental fruit and vegetable consumption, which is consistent with findings from previous studies. Behavioral measures of tactile, messy play are associated with food acceptance in young children. Research into tactile play is still in its infancy; therefore it is difficult to determine any causal pathways at this stage.

IV. Conclusion

These days' parents are struggling with their children's picky eating habits. They as parents want their child to take all possible nutrients to be a healthy happy child who in turn makes them upset. A lot of researches have been conducted in past and hopefully continues to explore strategies to educate parents about weaning off. This all starts when the child starts having his first words, a lot of parent counseling is needed to make sure they are not causing the child run away from food. Food texture, consistency, aroma and the way it is presented makes a huge impact on the child. There are tips available for the parents on how to start off with the first solids to avoid growing up a fussy eater. However, differences of opinions exist on the matter. One should thoroughly research and come up with a summarized form of food consistencies and the age of introduction for each one of them.

V. References

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