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Picky eating in preschool-aged children: Prevalence and mothers' perceptions in South-East Nigeria.

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Abstract

Background: Picky eating is common in preschool-aged children. Reported prevalence rates are mainly from developed countries, and vary widely because of the diversity of assessment methods and definitions. Mothers' intervention strategies are presumably related to their perceptions of picky eating.

Objective: The study aims to determine mothers' perceptions of picky eating in preschool-aged children and to estimate its prevalence in a developing country.

Methods: A total of 240 mother-child dyads who met the study criteria were enrolled from the children's outpatient clinics of three major tertiary health institutions in the south-eastern part of Nigeria. Study-specific questions to define picky eating, incorporated into an interviewer-administered structured questionnaire, were used to obtain data in line with the study objectives. Using descriptive statistics, data were analyzed on SSPS and presented in frequencies and percentages.

Results: Based on the adopted definition of picky eating in the study, the estimated prevalence rate was 17.5%. For mothers of picky eaters (n=55), 20/55 (36.4%) of them believed 'picky eating is always abnormal for children at any age', 13/55 (23.6%) felt 'picky eating is always abnormal for children at any age and leads to poor weight gain', 2/55 (3.6%) believed 'picky eating is always abnormal, leads to poor weight gain and should be corrected by parents', 8/55 (14.6%) responded that 'the child can learn picky eating from older children/siblings', while 12/55 (21.8%) maintained that 'picky eating leads to poor weight gain in children'. The mothers' self-reported intervention strategies included coercion to eat (18/55; 32.7%), the reward approach (12/55; 21.8%), and self-prescribed medications (15/55; 27.3%).

Conclusion: The prevalence of picky eating in this clime is comparable to rates in developed countries. Mothers' perceptions of picky eating determine their self-reported intervention strategies.

Keywords: Picky eating, Preschoolers, Prevalence, Mothers' perceptions, Interventions.

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Introduction

Picky eating ('fussy' or 'choosy eating') is a common behavior in preschool children, which may persist into late childhood and adolescence [1-4]. It is usually classified as part of a spectrum of 'feeding difficulties' where it is the most common form at one end, with severe eating disorders at the other end [5]. There is no consensus yet on a single definition of picky eating but most definitions include an element of restricted intake of familiar foods (often interpreted as loss of appetite) with a further degree of an unwillingness to try new foods or avoidance of new foods (food neophobia) [6]. Despite the absence of a universally accepted definition, picky eating characteristically includes rejection of certain varieties of foods, acceptance of only specific foods, food neophobia, restricted intake of some food groups and strong food preferences [7]. Furthermore, the differences in definitions used in several research settings have resulted in heterogeneity of assessment methods. These methods are broadly classified into two categories: utilization of item(s) from existing validated

questionnaires and the use of study-specific question(s) [5]. The diversities in measurement of the 'picky/fussy' concept will only result in more confusion and unresolved theoretical interpretation, which underscores the urgent necessity for a more applicable and validated assessment method in children [6]. Nevertheless, some authors believe that study-specific question(s) can be specially designed for the particular study cohort and can provide more flexibility than pre-existing questionnaire items, albeit difficult to analyze [5].

Picky eaters are exposed to a limited variety of diets, especially micronutrient-rich foods such as fruits and vegetables, and meats [8,9]. This limited dietary intake may potentially affect their weight gain and result in failure to thrive [10]. Consequently, picky eating is a cause of anxiety for caregivers and a source of mother-child conflicts [11,12].

The social, cultural and geographical environments within which the child grows up directly affect his food preferences. For instance, such social influences emanate from the parent, family and peer group. As primary care-givers, mothers' feeding styles/practices and other factors such as pressure to feed and personality factors influence the development of picky eating [13,14]. In addition, maternal healthy eating behavior has been linked with lower pediatric food pickiness, while maternal role in managing the child's eating behavior has also been documented in other studies [15-19]. Urban or rural environments also appear to play a significant role in food choice, as rural children may exhibit more food neophobia than their urban colleagues [20,21]: a finding attributed partly to increased cultural diversity in urban areas [21]. Culture can affect dietary diversity, quality and patterns. These dietary variables can in turn influence the development of picky eating. For instance, several investigators have reported that children who were picky eaters consumed less variety of food than non-picky eaters, while food neophobia is reportedly associated with reduced dietary variety and reduced intakes of fruits, vegetables and protein-rich foods [8,22-26]. Interestingly, some authors have brought the effect of the mother's cultural background on feeding practices to the front burner, having observed that the positive relationship between pressure-feeding and perceptions of pickiness were similar between Indian and European immigrant mothers into Australia [13]. To buttress this finding, these authors, and others in Turkey have also reported that the prevalence of picky eating was similar to that in developed countries [13,27].

The estimated prevalence rates of picky eating reported by studies conducted in several developed countries (spanning across North America, Europe and Asia-Pacific region) vary widely due to differences in definition of picky eating, age-specific variations and differences in methods of assessment [5]. For example, in the United States, one study which measured picky eating among 3 to 4 year-old children using several items reported a rate of 15.6%, while another study utilizing a single item documented 50% of 19-to 24-month-old children as picky eaters [28,29]. In Europe, studies in the Netherlands using different validated questionnaires noted rates of 5.6% among 4 year-old children, and 27.6% among 3 year old [30,31]. In Australia, a prevalence rate of 34.1% was reported among 1 to 5 year old children as the researchers used a single item as the assessment method for picky eating, while other workers in China using a similar assessment method documented a rate of 54.0% among 3 to7 year old children [13,32].

In contrast, there is dearth of studies on picking eating in developing countries especially in Africa. In Nigeria, although anecdotal evidence shows that picky eating is a frequent reason for consult, data is lacking on prevalence rates in children, maternal preconceptions and strategies for managing picky eating, as well as possible effect of the mother's cultural background on feeding practices and pickiness in children. For instance, in south-east Nigeria where culture presents the child with a typical dietary menu limited in variety and quality, it will also be interesting to explore this influence on picky eating.

The present study was therefore conducted in two urban settings in south-east Nigeria in order to estimate the prevalence of picky eating in preschool-aged children using study-specific questions, and to determine mothers' perceptions of this behavior.

Methods

Study Site/Participants

A total of 240 mother-child dyads were enrolled from the children's outpatient clinics of three major tertiary health institutions in the south-eastern part of Nigeria, namely University of Nigeria Teaching Hospital (UNTH), Enugu; Enugu State University Teaching Hospital (ESUTH), Enugu, Enugu State; and Federal Medical Centre, Owerri, Imo State. The two cities, in which the health facilities are domiciled, are cosmopolitan and serve as administrative capitals of their respective states. The common demographic characteristics of the two cities are the predominance of educated civil servants and the rapid urbanization and transition to Western lifestyles, especially dietary lifestyle. However, cultural influence still remains evident in the people's dietary patterns. Approval for the study was obtained from the Health Research and Ethics Committee (HREC) of the respective health institutions. The inclusion criterion was a biological mother or an adoptive mother with a child aged 1 to 5 years. The exclusion criteria consisted of any chronic illnesses that could affect the child's feeding habits (such as chronic kidney disease, malignancies and tuberculosis/ acquired immunodeficiency syndrome). Informed consent was obtained from each enrolled mother.

Study Design

The study instrument was an interviewer-administered

structured questionnaire made up of open-ended questions on the mother's and child's demographics (maternal age, number of living children, educational status and occupation and child's age, gender and school grade). In the current study, picky eating was defined by the child's poor appetite and food neophobia and food rejection. Closed ended questions on mothers' reported picky eating with listed options to choose from were on appetite; food neophobia; and food rejection. For appetite, the respondents were asked if their children readily and completely consume rations of food from the family menu, with a rating scale of 1=poor, 2=good and 3=excessive. Food neophobia was explored with the question- 'Does your child reject new varieties of foods in the family menu?'- The response was rated on a scale of 1 to 3 where 1=never, 2=sometimes and 3=always. Similarly, food rejection was probed from the mothers with questions on whether their children refused any of these food varieties namely vegetables, fruits, meats or fish; the responses were also rated on a scale of 1=never, 2=sometimes and 3=always. Other closed ended questions with listed options explored the mothers' general perceptions of picky eating in children and their self-reported intervention strategies for the behavior. Picky eating was defined as a positive response of 'always' (rating scale of 3) to the questions on food neophobia and food rejection as well as a negative response of 'poor' (rating scale of 1) to the question on appetite.

Statistical Analysis

The pooled data from the three study centers were entered and analyzed on SSPS (version 17.0, SSPS Inc., Chicago, Illinois). Using descriptive statistics, data were analyzed and presented in frequencies and percentages.

Results

Demographics of Mother-Child Dyads

As shown in Table 1, an appreciable number of the enrolled mothers were distributed in the age brackets of 25-30 years (90/240; 37.5%) and 30-35 years (68/240; 28.3%). A substantial proportion of these mothers had acquired tertiary education (158/240; 65.8%), and were self-employed (89/240; 37.1%). About 169/240 (70.4%) of the children paired with their mothers were aged 1-3 years with a male/female ratio of approximately 1.4/1.

Picky Eating: Estimated Prevalence Rate and Maternal Perceptions

Using the following proxy-rated characteristics with numerical scaling to define picky eating in the children-appetite (poor=1), food neophobia (always=3) and food rejection (always=3), the highest number of children (n=55) exhibited one of the picky eating criteria (poor appetite). Food neophobia (rating scale of 3) and food rejection (rating scale of 3) were noted in 39 and 32 children respectively. The mean number of children who exhibited the three picky-eating characteristics was 42, giving an estimated prevalence of 17.5% (Table 2).

Table 1. *Demographics of mother-child dyads*

Characteristics	N=240	(100%)
Age group of the mothers (years)		
15–20	1	(0.4)
20–25	32	(13.3)
25–30	90	(37.5)
30–35	68	(28.3)
35–40	17	(7.1)
40–45	26	(10.8)
45–50	3	(1.3)
50–55	3	(1.3)
Number of living children		
1–4	217	(90.4)
5–8	23	(9.6)
Educational attainment		
No formal education	6	(2.5)
Primary education	3	(1.3)
Secondary education	62	(25.8)
Post-secondary education	11	(4.6)
Tertiary education	158	(65.8)
Occupation		
Full time house wife	61	(25.4)
Civil servant	81	(33.8)
Private-sector employed	9	(3.8)
Self employed	89	(37.1)
Children's age range (years)		
1-3	169	(70.4)
3-5	71	(29.6)
Gender*		
Male	138	(57.5)
Female	102	(42.5)
School grade		
Not schooling yet	32	(13.3)
Pre-nursery	73	(30.4)
Nursery	121	(50.4)
Primary 1	14	(5.8)

*Male/Female ratio: 1.4/1

Table 2. *Mothers' reported picky eating in their children*

Picky eating* (definition criteria)	N=240	(100%)
1. Appetite		
Poor	55†	(22.9)
Good	152	(63.3)
Excessive	33	(13.8)
2. Food Neophobia		
Never	82	(34.2)
Sometimes	119	(49.6)
Always	39†	(16.3)
3. Food rejection		
Never	83	(34.6)
Sometimes	125	(52.1)
Always	32†	(13.3)

*Picky eating defined as a combination of poor appetite, food neophobia (always) and food rejection (always)
†Mean number of children with picky eating characteristics=42; (Prevalence rate of 17.5%)

In Table 3, the perceptions of mothers of picky eaters (n=55) consisted of three major elements namely their general perception of picky eating in children, their preconceptions about outcome and intervention strategies (the highest number of children with one of the picky eating criteria was taken as the frequency of picky eaters). A break-down of the statistics shows that 20/55 (36.4%) of the mothers believed 'picky eating is always abnormal for children at any age', 13/55 (23.6%) felt 'picky eating is always abnormal for children at any age and leads to poor weight gain', 2/55 (3.6%) believed 'picky eating is always abnormal, leads to poor weight gain and should be corrected by parents', 8/55 (14.6%) responded that 'the child can learn picky eating from older children/siblings', while 12/55 (21.8%) maintained that 'picky eating leads to poor weight gain in children'.

As shown in Table 4, mothers of non-picky eaters (n=185) perceived picky eating in children as follows: 'picky eating is a normal developmental phase' (97/185; 52.4%), 'picky eating leads to poor weight gain in children' (17/185; 9.2%), 'picky eating is a bad habit that should be corrected by parents' (31/185; 16.8%) and 'a normal developmental phase but leads to poor weight gain and should be corrected by parents' (28/185; 15.1%).

Mothers' Self-Reported Intervention Strategies for Picky Eating in their Children

As a corollary to their perceptions of picky eating, the following intervention strategies were reported by mothers whose children were picky eaters (n=55) in this order of frequency: coercion to eat (pressure feeding) (18/55; 32.7%), self-prescribed medications (multivitamin preparations and appetite stimulants) (15/55; 27.3%), and the reward approach (including bribing the child to eat) (12/55; 21.8%). No intervention strategies were mentioned by 10/55 (18.2%) of the mothers (Table 5).

As shown in Table 6, the reasons proffered by mothers for self- prescribed medications were: 'personal decision/ opinion' (4/15; 26.7%), 'advice from family relatives' (2/15; 13.3%), 'previous prescription by the doctor' (5/15; 33.3%), 'previous prescription by the pharmacist/ nurse' (3/15; 20.0%) and 'personal decision/opinion and previous prescription by the doctor' (1; 16.7%).

Discussion

In the current study, the prevalence rate of picky eating was estimated as 17.5%. This figure compares with the rates of 17% in China [33], 15.6% in USA [28], 20% in

Table 3. *Perceptions of picky eating among mothers of picky eaters*[†]

Perceptions	n=55	100 %
'Picky eating is always abnormal for children at any age'	20	(36.4)
'Picky eating is always abnormal at any age and leads to poor weight gain'	13	(23.6)
'Picky eating is always abnormal, leads to poor weight gain and should be corrected by parents'	2	(3.6)
'The child can learn picky eating from other children/siblings'	8	(14.6)
'Picky eating leads to poor weight gain in children'	12	(21.8)

[†]Highest number of children with one of the picky-eating criteria taken as the frequency of picky eaters

Table 4. *Perceptions of picky eating among mothers of non-picky eaters*

Perceptions	n=185	100%
No opinion offered by respondents	12	(6.5)
'Picky eating is a normal developmental phase'	97	(52.4)
'Picky eating leads to poor weight gain in children'	17	(9.2)
' Picky eating is a bad habit that should be corrected by parents'	31	(16.8)
'A normal developmental phase but leads to poor weight gain and should be corrected by parents'	28	(15.1)

Table 5: *Mothers' self–reported intervention strategies for picky eaters (n=55).*

Self-reported intervention strategies	Number of mothers	Percentage
Coercion to eat (pressure feeding)	18	32.7
Reward system (including bribing the child to eat)	12	21.8
Self-prescribed medications (multivitamin and appetite stimulants)	15	27.3
None mentioned by respondents	10	18.2
Total number of respondents	55	100%

Table 6. *Reasons given by mothers for using self-prescribed medications in picky eating*

Volunteered reasons	Mothers	%
Personal decision/opinion	4	26.7
Advice from family relatives	2	13.3
Previous prescription by the doctor	5	33.3
Previous prescription by the pharmacist/nurse	3	20.0
Personal decision/opinion/previous prescription by the doctor	1	6.7
Total number of respondents	**15**	**100.0**

New Zealand [34], as well as in Italy [35], 21% in USA [7], and 14-17% in Canada [36], from studies conducted among comparable age groups. In contrast, much lower rates of 5.6% in the Netherlands [30], 7.3% in Denmark [37], and 8.3% in UK [10] have been reported by other workers among under-fives. At the other extreme, much higher rates of 50% in USA [29], 54% in China [32], 39% in Turkey [27], 40.8% in Singapore [38], 34.1% in Australia [13], and 36.2% in China [23] have been documented. The prevalence of picky eating is difficult to determine because its definitions and assessment methods are heterogeneous and inconsistent, thus limiting the comparability of findings from previous studies [6]; even within a country, prevalence rates have been reported to differ. The wide differences in prevalence rates can be attributed to several confounders such as the diversity in assessment methods and the age of assessment of picky eating. While some of these studies used a single item [10,13,27,29,32,38] or multiple items [7,28,30,35,36 and 37] from existing validated questionnaires, others utilized study-specific questions [23,34] as measures to assess picky eating. The current study used study-specific questions which were considered easily understandable by the study populace and applicable to their cultural setting. A recent review highlighted the advantage of study-specific question(s) as that of more flexibility than pre-existing questionnaire items, although its disadvantage is that it is difficult to analyze [5]. Furthermore, the study in the Netherlands [30], and that in Denmark [37], reported low prevalence rates using a data-driven approach while almost all the studies which utilized a single-item approach [13,27,29,32,38], and a 3-item assessment method [35], to define picky eating- documented higher prevalence rates.

Secondly, a previous report shows that the highest incidence of picky eating occurs around the age of 2 years [14]. Picky eating at this age is most probably determined by food neophobia. In fact, prevalence rates of food neophobia are known to peak around the age of 2-6 years, when the child's mobility is increasingly evident, and it is favorable for him to be suspicious towards new foods from an evolutionary perspective [6,30]. Another study had observed that most of the respondents first noticed their children's picky eating as early as 1 year of life [39]. Thus, the preponderance of the child-population sample within the 1-3 year-old age bracket may also partly account for the relatively high prevalence rate in the current study. However, when compared to much higher rates documented in some developed countries, it is obvious other confounding factors may explain the disparities. For instance, the culture-driven food-related parenting style in south-east Nigeria is antithetical to picky eating in children; parents perceive good appetite as the fundamental sign of good health in children and thus enforce strict compliance to consumption of family menu through coercion or promotion of 'competitive feeding' among siblings by using a single feeding plate. Presumably, this cultural model of feeding may reduce the prevalence of pickiness in childhood despite the influence of urbanization and westernization. On the other hand, the monotony in dietary pattern within this clime, which is skewed towards carbohydrate-rich foods than protein-rich foods, may indeed encourage picky eating. Some authors have reported an association between food neophobia and reduced dietary variety and reduced consumption of fruits, vegetables and protein-rich foods [8, 24-26]. Further studies in other parts of this country are therefore needed to establish the influence of cultural background and other variables on picky eating.

In the current study, mothers of picky eaters perceived picky eating as a behavior that is 'always abnormal for children at any age, leads to poor weight gain, and should be corrected by parents'. They also believed that picky eating can be learned from siblings. The mothers' self-reported intervention strategies included coercion to eat, the reward approach, and self-prescribed medications. This is in contrast to the findings of the study in Singapore which indicate a greater cultural acceptance of some picky eating behaviors by caregivers as normal [38]. For instance, the authors noted that respondents who reported that the child was not a picky eater were more likely to report picky eating behaviors of 'eating slowly' or 'eating sweets instead of healthy foods' as occurring 'all the time' and 'sometimes' [38]. In addition, nearly half of the study respondents reported that they were 'very much concerned' about their children's picky eating behaviors; the most common concerns being the children's physical and mental development. Their reported intervention strategies include modifying food texture to make it easier to eat, allowing television viewing at mealtimes, presenting food in an age-appropriate manner, and consulting a doctor about the child's eating habits [38]. Despite the fact that mothers in the current study believed picky eating behaviors invariably affected the child's weight gain (which is consistent with the concerns of the respondents in the Singaporean study), other studies have shown that picky eating does not affect weight gain [19,40]. However, other investigators observed that picky eaters gained less weight than non-picky eaters [10]. This outcome of picky eating appears unresolved as the recent review on picky eating in children suggests that its influence on growth trajectories during childhood and adolescence remains unknown [5]

Again, subtle differences exist in the coping strategies/ interventions reported by mothers in the current study and the respondents in the Singaporean study. In our study, mothers' strategies for managing picky eating (coercion, reward and self-prescribed medications) constitute a negative approach while some of the proffered strategies in the comparative study [38], such as modifying food texture to improve palatability, presenting food in an age-appropriate way and consulting the doctor, are more positive intervention strategies. In fact, strategies such as threats, prodding, scolding, punishment, pleading, bribing

or coercion have been reported to reduce rather than increase the intake of food [10,33], while verbal praise or an encouraging mien are considered positive in promoting food likes [2,10].

Generally, parents can influence children's feeding behavior in a number of ways, namely controlling food availability and accessibility [41], food modeling [42], food socialization practices [43], and food-related parenting style [44]. Interestingly, three common food-related parenting styles have been described: permissive, authoritarian and authoritative [45]. In the current study, none of the coping/intervention strategies reported by the mothers reflected the permissive food-related parenting style of allowing the child to eat what he desired. This contrasts with the strategies reported among Mexican-American mothers which indicate the permissive style [46]. Authoritarian food parenting practices involve prompting children to eat when they are not hungry [47], as well as the strategies of using food to pacify, reward or punish the child [43]. Obviously, the coping/intervention strategies for picky eating reported by mothers in our study are suggestive of this authoritarian food-related parenting style. This is in keeping with the observation in a study which shows that African-American families had the tendency towards the same authoritarian style [48]. Another study has also noted that mothers frustrated by their children's picky eating reported using similar strategies to increase food intake [49]. Furthermore, a report from focus group discussions (FGDs) conducted among low-income Latino families in the United States showed that the most common strategy to encourage children to eat was bribing (a form of authoritarian parenting) [50]. On the other hand, authoritative parenting style employs reasoning or negotiation with the child. It includes asking the child to make decisions about his diet, persuading him to eat using discussion, and praising him for eating healthy diet. None of these coping/intervention strategies were however mentioned by mothers in the current study. Nevertheless, anecdotal evidence suggests that mothers in this environment frequently resort to self-medication (especially the use of multivitamin preparations and/ or appetite stimulants) as the coping/intervention strategy. Expectedly, a substantial number of mothers in our study reported this intervention strategy although it has no scientific basis, and thus constitutes a wrong application of drugs.

Finally, some authors have proffered treatment strategies which may only address short-term targets [51]; the effectiveness of these strategies has however not been fully assessed. These strategies include restraining too much drinking in the child (particularly between meals), not allowing food grazing, providing more frequent but smaller meals, ensuring more meal-time structure, having consistent feeding expectations and presenting small tastes of rejected foods on at least ten separate occasions [51].

Limitations of the Study

First, the sample size was small; data findings may thus not be representative of the general population in this region of the country. Second, picky eating in the preschool child was proxy-reported and proxy-rated. Other information also depended on mothers' recall, thus exposing the data to bias. Third, the assessment method used to define picky eating was not based on the use of item(s) from pre-existing validated questionnaires. Finally, the random sampling technique had resulted in a male gender bias among the child-pairs and a preponderance of highly educated mother-pairs. The effect of birth order was also not explored.

Conclusion

The prevalence of picky eating in this clime is comparable to rates reported in developed countries. Mothers' preconceptions determine their self-reported intervention strategies. Their perceptions can be utilized to develop the template in guiding them on appropriate interventions. Emphasis should be on correcting the wrong pre-conceptions about picky eating, as well as discouraging their negative coping/intervention strategies, and the use of self-prescribed medications.

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