

Examining the Prevalence and Socio-demographic Correlates of Food Neophobia and Fussiness in Nsukka Urban School-aged Population

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Abstract

The study assessed the prevalence and associated factors of food neophobia and food fussiness among school-aged children in Nsukka urban. The 4 objectives guided the study were to determine the prevalence of food neophobia and fussiness and to ascertain the demographic factors associated with food neophobia and fussiness. A descriptive cross-sectional survey design was adopted for the study. The population was 23,570 pupils in Nsukka urban and a multi-stage sampling technique was used to select 398 pupils to participate in the study. A structured questionnaire with a reliability index of 0.86 and 0.74, was used for data collection. Frequencies, percentages, means, standard deviation and chi-square were used for data analysis. Findings showed that the overall prevalence of food neophobia among the children was 22.3%, with common food neophobia behaviors being preferring familiar cultural foods and avoiding unknown foods. Food fussiness was observed in 25.5% of the children, with behaviors such as being selective about what children eat and reluctance to try foods from other ethnic groups. Socio-demographic factors such as gender, school type, religion, ethnicity, family type, parents' age, marital status, occupation, household income and size were significantly associated with food neophobia. The child's age, area of residence and parents' education were not significantly associated with food neophobia. Food fussiness was significantly associated with socio-demographic factors, including the child's age, ethnicity, family type, parents' age and occupation, household size and income. Child's gender, school type, religion, area of residence, parents' marital status and education were not significantly associated with food fussiness among the children. The study concludes that various socio-demographic factors influence the prevalence of food fussiness and neophobia among children. This highlights the need for targeted interventions that consider these factors to promote healthy eating behaviors among children. Nutritionists and food scientists were recommended to conduct nutrition education campaigns to raise awareness about the importance of an adequate diet.

Keywords: Food Neophobia, Food Fussiness, Child Nutrition, Eating Behaviors, Food Choice

Introduction

Eating various foods is essential to maintaining good nutrition, which is necessary for overall health. This entails consuming a diverse range of food types, nutrients and from diverse sources. de Oliveira Otto et al. (2018) posit that a diversified diet is best practice for maintaining a balanced, nutritionally appropriate diet and lowering the risk of

major chronic diseases. As a result, determining what to and what not to eat influences an individual's nutritional health, (Okumus et al., 2021; Özdemir & Baltaci, 2025). Brown et al. (2020) and Lee and Yan (2020), have demonstrated that cultural differences in food choices generate considerable alterations in food choices and that poor nutrition practices

increase the risk of problematic eating behaviors. During early life, children are gradually introduced to an increasingly diverse diet that includes previously unknown foods with distinct flavors, textures and visual qualities. Children are open to new cuisines, while some children are hesitant to new foods, these behaviors can be broadly characterized as food fussiness (FF) and food neophobia (FN), and are characteristics of childhood eating problems.

Food neophobia is defined as a reluctance to eat or an outright avoidance of new foods, is a behavioural trait in children that have often been associated with the rejection of healthful foods, particularly fruits and vegetables. This phobia can lead to a restricted diet and in certain situations, can be a precursor to more serious eating problems. Siddiqui et al. (2022) and Karaadaç & Bellikci-Koyu (2022) indicate that FN can decrease consumption of healthy foods and limit willingness to try healthier alternatives. Thus, FN is substantially linked to poor nutritional quality in children. Neophobic individuals eat a smaller variety of foods and hence may be more susceptible to nutrition deficiencies (de Almeida et al., 2020). Effective treatment in childhood, such as using cooking-related activities, encouraging flexibility and adjustment in food-related circumstances (Maiz et al., 2021; Shimshoni et al., 2020), may lessen FN. Conversely, if children are not provided with appropriate treatment, food neophobia may persist into adulthood. Parental feeding methods, maternal feeding practices, past infant feeding practices, including exposure to a variety of foods and the timing of the parents' decision to introduce solids are some factors that may contribute to food neophobia (Okonkwo & Samuel, 2021).

Food fussiness which is picky and

fussy eating, refers to a child's consumption of an insufficient range of foods by refusal of a wide range of familiar and unfamiliar foods (Del Campo et al., 2024; Krupa-Kotara et al., 2024). Food fussiness is a subset of eating behavior that involves food choice and motives, feeding practices, dieting and eating-related problems (Umennuihe et al., 2024). Picky eating in children has been linked to early feeding difficulties, delayed introduction of solid foods at weaning period, pressure to eat and early choosiness. It is a common behavior in young children, particularly in toddlerhood and is predicted to resolve independently when children grow more socially active in school (Fuller, 2024), however, there are some children whose fussy eating fails to ameliorate. The implications for the child's diet include a lack of nutritional variety and a potential distortion of nutrient intakes, with low iron and zinc intakes related to low intakes of meat, fruits and vegetables. Picky eaters who consume insufficient amount of dietary fiber due to a lack of fruits and vegetables are more likely to have constipation (Taylor & Emmet, 2019). Furthermore, developmental difficulties may persist in children whose picky eating habits persist into school-age.

School-age children, who typically range in age from 6 to 12, are going through rapid physical and mental growth. During this stage, children gain independence, accept more responsibility for their lives, and learn to manage their emotions better. Children also learn to comprehend their social roles and create more meaningful bonds. At this stage, children form a sense of self, learn about the importance of rules and regulations and question the ideals underpinning certain behavior. Additionally, children acquire and develop new and important practical,

social and emotional skills (Parent Help, 2022). It is therefore critical that children develop and maintain positive eating habits. Children who exhibit neophobic and picky eating habits are likely to be overweight because these children consume a limited variety of fruits and vegetables (de Almeida et al., 2020). The lack of variety in the diet limits the intake of nutrients required to sustain healthy nutrition in the body. When the imbalance is severe and long-lasting, it tends to damage several systems in the body, including the neurological system, limiting the child's overall development (de Oliveira Torres et al., 2020).

Food neophobia and fussiness can be inherited or influenced by environmental factors. The social context, family and peers may or may not allow individuals to express their personality through eating practices, leading to a tendency for nutritional neophobia (Jezewska-Zychowicz et al., 2021). FF is also connected with behavioral issues, as well as concurrent and prospective feelings of anxiety and depression, whereas FN is associated with traits such as shyness or inhibition, both of which have documented hereditary influences. FF has been connected to environmental variables such as breastfeeding duration and persuasive feeding practices. This implies that a child is more genetically predisposed to FN, but that environmental factors are critical in the development of FF (Smith et al., 2017). Parents, particularly mothers, who play a significant role in establishing children's eating habits may pass on a tendency for nutritional neophobia (Bia³ek-Dratwa et al., 2022). It is vital to highlight that children are at the beginning stages of learning and are only developing their taste preferences, self-regulatory processes and the abilities of solid food consumption (Maiz et al., 2021;

Marlow & Forestell, 2022). Therefore, understanding the food neophobia and fussy behaviors in children is important to prevent health consequences at an early stage with later life consequences in adulthood.

Statement of the Problem

Large-scale, rapid economic and social shifts have impacted children's health and nutrition. Indeed, poor eating habits throughout a child's formative years contribute to childhood obesity (Maneschy et al., 2024). Oly-Alawuba and Nnam (2018) showed that the prevalence of childhood overweight and obesity in Enugu State was 10.3% and 6.0%, respectively. Furthermore, the prevalence of childhood overweight and obesity in Nsukka urban was 12.3% and 2.3%. Qu et al. (2024) and Pfefferbaum et al. (2024), who focused on the behavioral determinants that increase the risk for obesity, have pointed to food neophobia and fussiness as some of the most important factors. Since food availability and accessibility correlate with the start of FN and FF, easy access to highly processed foods, specifically designed to be palatable, promotes unhealthy eating patterns in children (dos Anjos et al., 2021). Unresolved FN and FF in children put children at risk of not just obesity but also thinness later in life (Taylor & Emmett, 2019). These children must be identified at a young age, so parents can receive help, monitoring and advice. In response to this challenge, research is required to assess the prevalence of food neophobia and food fussiness among school-aged children.

Objectives of the Study

The broad objective of the study was to examine the prevalence and socio-demographic correlates of food neophobia and fussiness among school-

aged children in Nsukka urban. Specifically, the study determined the:

1. prevalence of food neophobia among school-aged children in Nsukka urban;
2. prevalence of food fussiness among school-aged children in Nsukka urban;
3. relationship between socio-demographic factors (age, gender, income, education, and housing) and prevalence of food neophobia;
4. relationship between socio-demographic factors (age, gender, income, education, and housing) and prevalence of food fussiness.

Methodology

Study design

A descriptive survey research design was employed to achieve the objectives of this study. This design was suitable for this study because descriptive data on the population's characteristics, features or facts were collected systematically (Siedlecki, 2020).

Population of the study

The population for this study were the parents of 23,570 pupils (8,050 pupils in the 37 public and 15,520 pupils in the 60 private primary schools) in Nsukka Urban, Enugu State (School Statistics, Nsukka LGA, 2024). Nearly half of the children's parents were aged 46 years and above. The majority of them were married and had attained higher education. The parents were mostly business owners and civil servants.

Sample and sampling techniques

Sampling was done in multiple stages. In the first stage, Cochran's formula (see image below) for a finite population was used to calculate the sample size (n) of 402 from a known population size (N).

$$n = N \times \frac{\left[\frac{Z^2 \times p \times (1-p)}{e^2} \right]}{\left[N - 1 + \frac{Z^2 \times p \times (1-p)}{e^2} \right]}$$

n: Sample Size
N: Total Population Size
Z: Z-score (for Confidence Level)
p: Estimated Population Proportion
e: Margin of Error

In the second stage, using systematic random sampling, 15% (6) of the 37 public and 10% (6) of the 60 private schools were selected from the list of schools. The third stage involved using proportionate sampling to determine the sample size for each selected school. In the final stage, simple random sampling was used to select the pupils from each school whose parents participated in the study.

Method of data collection

Data was collected using a structured questionnaire. The instrument was divided into three sections, A-C. Section A was used to elicit information on the socio-demographic characteristics of the respondents. Section B was the Children's Food Neophobia Scale (CFNS) developed by Pliner (1994), which comprised 14 items. Section C was the Child Eating Behavior Questionnaire (CEBQ), food fussiness subscale comprising seven items. Responses were on a 5-point Likert scale ranging from 'always' (5) to 'never' (1). The instrument was face and content validated by three lecturers from the Department of Home Science and Management, who are experts in the field. The CFNS has a Cronbach's alpha coefficient of 0.86, confirming the high reliability of this scale in assessing the level of food neophobia in children. The CEBQ food fussiness subscale has a Cronbach's alpha coefficient of 0.74, indicating a good internal consistency. The questionnaires were hand-distributed to the pupils by two research assistants. The pupils were required to take the questionnaire back home to any of their parents or guardians.

Four hundred and two questionnaires were distributed, but the researchers retrieved 398, giving a 99% return rate.

Data analysis techniques

To determine the overall prevalence of food neophobia and food fussiness, the average percentage of individuals who responded “often” or “always” was calculated for the items on CFNS and CEBQ. The prevalence of food neophobia was determined by computing the average percentage of responses indicating reluctance to try new foods across 14 questions. The prevalence of food fussiness was determined by averaging the percentage of individuals who exhibited selective eating behaviors across seven questions. Data collected was entered into the computer software, IBM SPSS, version 23.0. Descriptive statistics such as frequencies and percentages were used to analyze data on the socio-demographic characteristics and prevalence of food fussiness and food neophobia. Inferential chi-square statistics was used to determine the association between socio-demographic factors and food fussiness and neophobia. The level of significance was set at $p < 0.05$.

Results

Figure 1 shows the prevalence of food neophobia among children. The overall prevalence of food neophobia was calculated as 22.3%, based on the average percentage of individuals who reported food neophobia-related behaviors.

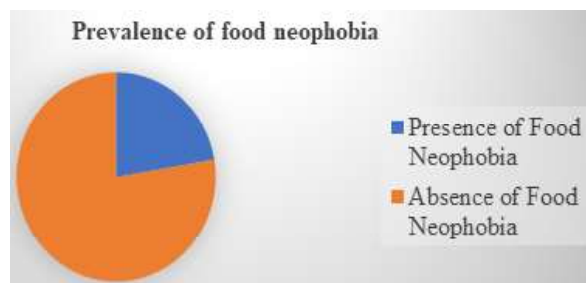


Figure 1: Prevalence of food neophobia

Table 1 presents the frequency and percentage distribution of respondents' food neophobia-related behaviors. Key findings indicate that 39.7% of respondents often enjoy food from different cultures, while 37.9% often try new foods at parties. Conversely, 29.4% often avoid unknown foods, and 31.9% find trying new foods to be scary. A notable 28.6% rarely express interest in tasting new food, while 26.1% rarely enjoy tasting unfamiliar foods. These results highlight varying levels of food neophobia among respondents, with some showing openness to new foods and others displaying reluctance.

Table 1: Frequency and Percentage Responses on Food Neophobia-Related Behaviors

Food Neophobia Behavior	Often		Rarely	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Sampling new and different foods	87	21.9	87	21.9
Not trusting new foods	81	20.4	77	19.3
Avoiding unknown food	117	29.4	79	19.8
Liking food from different cultures	158	39.7	113	28.4
Other ethnic groups' food is unfamiliar	103	25.9	103	25.9
Trying new food at parties	151	37.9	47	11.8
Afraid to eat new foods	107	26.9	76	19.1
Reluctant to try unfamiliar food	102	25.6	52	13.1
New food can be scary	127	31.9	110	27.6
Smell of new food	33	8.3	98	24.6
Strange or different food	40	10.1	95	23.9
Refuse new foods at first	85	21.4	61	15.3
Do not enjoy tasting new food	59	14.8	104	26.1
Not interested in tasting new food	70	17.6	114	28.6

Prevalence of food fussiness

Figure 2 shows the prevalence of food fussiness among children. Up to 25.5% of the children were picky eaters, while 74.5% showed no fussy eating behaviors.

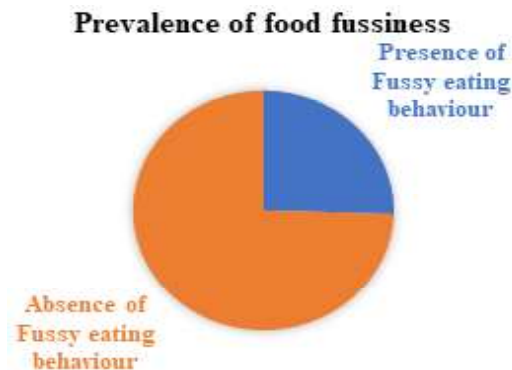


Figure 2: Prevalence of food fussiness

Table 2 presents the frequency and percentage distribution of respondents' food fussiness behaviors, categorized into "Often" and "Rarely." The results indicate that 52.8% of respondents often exhibit particularity about the foods they eat, while 27.6% report eating almost anything. Additionally, 28.6% frequently

try restaurants from other ethnic groups, whereas 25.4% find it difficult to be pleased with meals. A notable 21.1% dislike unfamiliar foods with textures, both often and rarely. These findings highlight variations in food fussiness, with some respondents displaying selective eating habits while others show openness to diverse food choices.

Table 2: Frequency and Percentage Responses on Food Fussiness-Related Behaviors

Food fussiness behavior	Often		Rarely	
	Frequency	Percentage	Frequency	Percentage
Particular about the foods	210	52.8	82	20.6
Eat almost anything	110	27.6	92	23.1
Restaurants of other ethnic groups	114	28.6	99	24.9
Do not enjoy a wide variety of foods	83	20.9	76	19.1
Difficult to please with meals	58	14.6	101	25.4
Decide not to like a food without tasting it	51	12.8	65	16.3
Do not like familiar foods with unfamiliar textures	84	21.1	84	21.1

Table 3 presents the socio-economic factors associated with food neophobia among the children. At the $p < 0.05$ level of significance, gender of the child, school type, religious affiliation, ethnicity, family type, parents' age, household size, marital status, parents' occupation, and household monthly income were

significantly related to food neophobia. However, a child's age, area of residence and parents' education level did not correlate significantly with food neophobia, indicating that these factors had minimal influence on selective eating behaviors.

Table 3: Socio-demographic Factors Associated with Food Neophobia

Factors	Chi-square value	p-value
Child's gender	33.000	0.000*
Child's age	3.200	0.074
School type	33.966	0.000*
Religion	4.059	0.044*
Ethnicity	14.666	0.002*
Area of residence	0.506	0.477
Family type	21.684	0.000*
Parents' age	8.233	0.041*
Parents' marital status	6.268	0.044*
Parents' occupation	17.688	0.001*
Household size	6.933	0.031*
Household monthly income	25.685	0.000*
Parents' education	4.304	0.116

*Significant at $p < 0.05$

Table 4 presents the socio-economic factors associated with food fussiness. At a $p < 0.05$ level of significance, gender and age of the child, ethnicity, family type, parents' education, occupation, age, household monthly income and household size were significantly

associated with food fussiness. However, school type, religion, area of residence and parents' marital status were not significantly associated with food fussiness, indicating that these factors had minimal influence on selective eating behaviors.

Table 4: Socio-economic Factors Associated with Food Fussiness

Factors	Chi-square value	p-value
Child's gender	0.083	0.773
Child's age	12.461	0.000*
School type	3.157	0.076
Religion	0.750	0.386
Ethnicity	14.113	0.003*
Area of residence	0.310	0.577
Family type	14.398	0.003*
Parents' age	16.193	0.001*
Parents' marital status	3.607	0.165
Parents' occupation	28.476	0.000*
Household size	8.542	0.014*
Household monthly income	8.541	0.014*
Parents' education	1.679	0.432

*Significant at $p < 0.05$

Discussion

This study showed the prevalence and factors associated with food neophobia and fussiness among school-aged children in Nsukka urban. The prevalence of food neophobia was 22.3%, suggesting significant implications for dietary habits and the need for nutrition education. Specific behaviors included trust issues with new foods, avoiding unknown foods, fear of eating new foods, reluctance to try unfamiliar foods and reluctance to try foods from different cultures and ethnic groups. These behaviors could lead to limited dietary diversity and potential nutritional deficiencies. The findings of this study align with previous research on food neophobia among children. For instance, Okonkwo and Samuel (2021) found a 35% prevalence of food neophobia among children in

Ibadan. Krupa-Kotara et al. (2024) found that 59.1% of child participants were observed to be at significant risk for food neophobia. Children who exhibit high levels of food neophobia tend to have a limited variety of foods in their diet, leading to potential nutritional deficiencies. Addressing food neophobia is crucial for promoting healthy eating habits and ensuring adequate nutritional intake among children.

Picky eating is characterized by rejecting particular types of foods, accepting only specific foods, restricting intake of various food groups and strong dietary preferences. From the findings, the prevalence of food fussiness was 22.5%. This suggests that these fussy eaters were often particular about the foods they ate, and they were difficult to please with meals, disliked food before even tasting it, and disliked food with unfamiliar

textures. The prevalence rate of food fussiness is similar to that of Uwaezuoke et al. (2016), which showed a 17.5% prevalence rate of picky eating among children in South-east, Nigeria. Food fussiness in children is associated with limited dietary variety and can pose challenges for parents and caregivers in ensuring balanced nutrition. This is because food fussiness is related to lower acceptance of fruits and vegetables, which are essential for a healthy diet.

Several factors, including socio-economic and demographic characteristics, influence food neophobia. The findings from this study revealed a significant relationship between several socio-demographic characteristics and food neophobia among children in Nsukka urban. These factors include gender, school type, religious affiliation, ethnicity, family type, parents' age, household size, marital status, parents' occupation, and household monthly income. This suggests that gender plays a role in the exhibition of food neophobia behaviors among children in Nsukka urban. Children attending either public or private schools tend to exhibit different levels of food neophobia. The role of religion and culture in children's food choices was significant, implying that cultural background could be an influencing factor (Pourabbasi et al., 2021). These findings imply that interventions aimed at reducing food neophobia among school-aged children should consider these socio-economic factors. Findings also showed that a child's age, area of residence and parents' education level did not correlate significantly with food neophobia. This suggests that the child's age does not influence food neophobia. Whether or not the family lives in a rural or urban area tends not to influence their decision to try new foods. The fact that most parents had obtained

tertiary education may have had nothing to do with whether or not the children are afraid of trying new foods. Rabadán and Bernabéu (2021) revealed that socio-economic variables such as gender, income, area of residence, culture, education and age all have a varying influence on food neophobia behaviors in children. Siddiqui et al. (2022) posit that early exposure to diverse foods in a supportive environment can mitigate food neophobia regardless of socio-economic characteristics. Economic interventions might also be necessary, as household income and guardian occupation significantly impact food preferences.

Genes mainly influence fussy eating, but environmental factors, including specific socio-economic characteristics, play significant roles. Findings of this study showed that gender and age of the child, ethnicity, family type, parents' education, occupation and age, household monthly income and household size were significantly associated with food fussiness. This suggests that both the age of the parent and the child's age play a role in children's picky behavior. These findings on gender significance align with those of Obidoa et al. (2021), which showed a significant mean difference in food fussiness between boys and girls, where boys tended to have more food fussiness than girls. Furthermore, Rahill et al. (2019) pointed out that a child's age is related to food-picky behaviors. Supporting this, Chilman et al. (2021) reported that picky eating increases significantly with the child's age and is also affected by maternal age. This study also showed that school type, religion, area of residence and parents' marital status were not significantly associated with food fussiness, indicating that these factors had minimal influence on selective eating

behaviors. Although socio-economic factors are important, early exposure to diverse foods in a supportive environment can mitigate food fussiness regardless of socio-economic status. Understanding the role of family dynamics can help tailor interventions that address specific family-related factors influencing food fussiness.

Conclusion and Recommendations

The prevalence of food neophobia and fussiness and their significant association with specific socio-economic characteristics highlight the need for targeted interventions that consider these factors to promote healthy eating behaviors among children.

The following recommendations were made based on the findings of this study.

1. Parents should adopt specific strategies to alleviate eating problems in young children, such as involving children in meal preparation, creating a positive eating environment and eliminating mealtime distractions.
2. Nutritionists should promote nutrition education campaigns to raise awareness about the importance of adequate diet, focusing on educating parents and caregivers. Nutritionists can also liaise with school administrators to provide awareness seminar for school children on the importance of adequate nutrition and the dangers of selective eating.
3. Mass media advertisement through the television should create awareness on feeding programs using different types of food through cooking classes, tasting sessions and interactive activities to make healthy foods more appealing to the general public and children's programs.

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