

# Gender effect on eating habits of Nigerian school children

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## Abstract

It is important to investigate children's eating habits based on different eating behaviors such as satiety responsiveness (SR), slowness in eating (SE), food fussiness (FF), food responsiveness (FR), enjoyment of food (EF), desire to drink (DD), emotional under-eating (EUE), and emotional over-eating (EOE). The main objective of this research was to investigate whether gender affects the eating habits of Nigerian school children.

A cross-sectional survey was conducted between March and June 2019. A total of 120 parents of school children participated in the study. The Child Eating Behavior Questionnaire (CEBQ) was used to collect data. The CEBQ is composed of 35 items and eight subscales.

Based on the analysis of parents' reports, DD was higher in boys than girls,  $t(118) = 7.086, P < .001$ ; EOE was higher in boys than girls,  $t(118) = 5.184, P < .001$ ; EF was higher in boys than girls,  $t(118) = 2.183, P < .001$ ; FF was higher in boys than girls,  $t(118) = 9.441, P < .001$ ; and SR was higher in boys than girls,  $t(118) = 7.323, P < .001$ . However, EUE was lower in boys than girls,  $t(118) = -4.339, P < .001$ ; FR was lower in boys than girls,  $t(118) = -3.112, P < .001$ ; SE was lower in boys than girls,  $t(118) = -3.832, P < .001$ ; thus, gender had a significant influence on eating habits of the school children.

Gender significantly affects the eating habits of Nigerian school children. Thus, gender is an important factor to be considered when aiming to improve the eating habits of Nigerian school children.

**Abbreviations:** CEBQ = Child Eating Behaviour Questionnaire, DD = desire to drink, EF = enjoyment of food, EOE = emotional over-eating, EUE = emotional under-eating, FF = food fussiness, FR = food responsiveness, LGAs = Local Government Areas, SE = slowness in eating, SR = satiety responsiveness.

**Keywords:** eating habits, gender, school children

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The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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## 1. Introduction

Globally, various aspects of children's health are influenced by their eating habits.<sup>[1,2]</sup> Children's eating habits can determine their growth rate, their extent of susceptibility to diseases, and their interaction with their parents or family.<sup>[3]</sup> Studies show that there exists a relationship between eating habits and children's nutritional status.<sup>[4-6]</sup> Poor eating habits contribute to physical, dental, and mental challenges among children globally.<sup>[7,8,9,10]</sup> In Nigeria, the nutritional problems of children appear heterogeneous due to the mixture of obesity with overweight or underweight.<sup>[11,12]</sup> Also, studies in the Nigerian population have focused mainly on the prevalence of eating disorders and their attendant health consequences. In a previous cross-sectional survey in the southern part of Nigeria, researchers reported prevalence rates of 2.8%, 11.4%, and 13.0% for obesity, overweight, and thinness among school-aged children and adolescents; 3.7% of the female respondents were more obese than male respondents (1.8%).<sup>[2]</sup>

A report from a previous prevalence study among a select sample of Nigerian adolescents and children revealed that 9.7% of the respondents were overweight while 1.8% were obese; overweight prevalence was greater for females (20.3%) than males (16.2%).<sup>[13]</sup> Another Nigerian study involving 1054 adult samples reported that 16% of these respondents had a disordered eating habit; disordered eating habits and gender were

significantly related.<sup>[14]</sup> However, there is still a dearth of research regarding the gender effect on eating habits of primary school children in Nigeria. To adequately deliver nutritional counselling and education and promote healthy eating attitudes among children and their parents, it is important to investigate children's eating habits based on different eating behaviors such as satiety responsiveness (SR), slowness in eating (SE), food fussiness (FF), food responsiveness (FR), enjoyment of food (EF), desire to drink (DD), emotional under-eating (EUE), and emotional over-eating (EOE).<sup>[15]</sup> Only a recent Nigerian study,<sup>[16]</sup> to our knowledge, has considered these dimensions of eating behaviors in investigating the eating habits of Nigerian school children, although it focused only on the extent to which parental education levels influence children's eating habits. The current study, therefore, aimed to investigate the effect of gender on eating habits among a select group of Nigerian primary school children by considering these dimensions of eating habits.

## 2. Method

This study was approved for the authors by the Education Faculty Research Ethics Committee at the University of Nigeria. In conducting this study, research principles stated by the World Medical Association's Declaration of Helsinki were followed. This cross-sectional analytic study was conducted between March and June 2019.

The study was conducted in Abakaliki Metropolis, Ebonyi State, Nigeria. The metropolis is composed of 2 Local Government Areas (LGAs), namely Abakaliki and Ebonyi LGAs. The metropolis is not entirely urban, as some parts are still rural and are mainly occupied by indigenes. The total population of both LGAs, in the 2006 census, was 276,909.<sup>[17]</sup> The sample size was calculated based on the target power 0.83 at the alpha-level of 0.05 for 2 independent *t*-tests analysis as determined with G\*Power 3.1.9.4 software.<sup>[18]</sup>

Given that parents play crucial roles in shaping children's eating behaviour through family meals, the study participants comprised of a sample of 120 parents of school children from 5 selected public primary schools in Ebonyi State, Nigeria. A simple random sampling technique (balloting without replacement) was used to select these 5 schools. This technique was used to provide each school with the opportunity to be selected and thus eliminate selection bias. A convenience sample of 120 parents of children from the selected schools was further stratified by gender (male, *n* = 45, 37.5%; female, *n* = 75, 62.5%). The sample size from each public primary school used in this study is shown in Table 1.

Before sampling, the researchers and assistants purposively visited 10 primary schools in the surveyed state to seek the school head-teachers' approval, and to explain to them the purpose of the study, and the possibility of their school being included or

excluded from the study later based on eligibility criteria. For example, the research inclusion criteria were the school's approval and agreement to invite parents to participate in the survey, parents providing informed consent to participate in the survey, and parents' availability to complete and return the questionnaire. Thus, an exclusion criterion was implied when the respondents or schools did not meet any of the inclusion criteria.

The research data were collected using the Child Eating Behavior Questionnaire (CEBQ).<sup>[15]</sup> The CEBQ, designed to evaluate children's eating attitudes, is composed of 35 items and 8 subscales – SR (5 items), SE (4 items), FF (6 items), FR (5 items), EF (4 items), DD (3 items), EUE (4 items), EOE (4 items) – and rated on a five-point rating scale ranging from never to always. The validity of CEBQ in measuring eating styles in children has been shown (Cronbach's alpha: 0.72–0.91; test-retest reliability, *r*: 0.52–0.87).<sup>[15,19]</sup> The following are the internal consistencies (Cronbach's alpha) of the CEBQ subscales in this study: SR = .65; SE = .80; FF = .74; FR = .69; EF = .54; DD = .63; EUE = .73; EOE = .66.

Copies of the CEBQ were distributed and retrieved from parents of the children (children's age range: 8–12 years old; gender: male children = 40, female children = 80; class level: primary 3–5) during school scheduled meetings with the parents. The respondents were guided appropriately and given sufficient time to avoid incomplete responses. In a situation where a parent had more than 1 child in a selected school, he/she was requested to answer questions concerning 1 of their children in that school. Responses and return rates were 100%. The independent *t*-test statistic was used to analyze the data from this study. We tested for data normality and violation of assumptions. Data were normally distributed, and statistical assumptions were met. We also screened for missing data, and there were no missing data. All statistical analyses were carried out using IBM SPSS, version 20. Results were deemed significant at  $P \leq .05$ .

## 3. Results

Results showed that there was a significant mean difference in satiety responsiveness (SR) between boys and girls ( $t(118) = 7.323, P < .001$ ). The boys ( $19.71 \pm 2.10$ ; 95% CI = 19.08–20.34) tended to be more responsive to food than girls ( $16.76 \pm 2.16$ , 95% CI = 16.26–17.26). (See Table 2).

Also, there was a significant mean difference in slowness in eating (SE) between boys and girls ( $t(118) = -3.832, P < .001$ ). The boys ( $15.07 \pm 1.57$ ; 95% CI = 14.59–15.54) seemed to be less slow in eating than girls ( $16.27 \pm 1.71$ , 95% CI = 15.87–16.66). (See Table 2).

There was also a significant mean difference in food fussiness (FF) between boys and girls ( $t(118) = 9.441, P < .001$ ). The results demonstrated that boys ( $24.44 \pm 2.31$ ; 95% CI = 23.75–25.14) tended to have more food fussiness than girls ( $19.93 \pm 2.66$ , 95% CI = 19.32–20.54). (See Table 2).

There was a significant mean difference in food responsiveness (FR) between boys and girls ( $t(118) = -3.112, P < .001$ ). The boys ( $19.26 \pm 2.47$ ; 95% CI = 18.52–20.01) were less responsive to food than girls ( $20.59 \pm 2.11$ , 95% CI = 20.10–21.07). (See Table 2).

There was a significant mean difference in the enjoyment of food (EF) between boys and girls ( $t(118) = 2.183, P < .001$ ). The boys ( $14.42 \pm 1.80$ ; 95% CI = 13.88–14.96) tended to enjoy food more than girls ( $13.67 \pm 1.86$ , 95% CI = 13.24–14.09). (See Table 2).

**Table 1**

### Sampling Frame.

School	n
School 1	20
School 2	33
School 3	28
School 4	24
School 5	15

*n* = sample size per school.

**Table 2**  
**Eating habits of school children by gender based on parents' ratings.**

CEBQ subscales	Variables	Mean	SD	Mean difference	t	P	95% CI
SR	Male	19.71	2.10	2.951	7.323	<.001	19.08–20.34
	Female	16.76	2.16				16.26–17.26
SE	Male	15.07	1.57	–1.200	–3.832	<.001	14.59–15.54
	Female	16.27	1.71				15.87–16.66
FF	Male	24.44	2.31	4.511	9.441	<.001	23.75–25.14
	Female	19.93	2.66				19.32–20.54
FR	Male	19.26	2.47	–1.320	–3.112	<.001	18.52–20.01
	Female	20.59	2.11				20.10–21.07
EF	Male	14.42	1.80	.756	2.183	<.001	13.88–14.96
	Female	13.67	1.86				13.24–14.09
DD	Male	12.46	1.93	2.240	7.086	<.001	11.89–13.05
	Female	10.23	1.15				9.96–10.49
EUE	Male	15.46	2.15	–1.640	–4.339	<.001	14.82–16.11
	Female	17.12	1.74				16.71–17.51
EOE	Male	15.40	2.24	1.987	5.184	<.001	14.73–16.07
	Female	13.41	1.63				13.04–13.79

CEBQ = Child Eating Behaviour Questionnaire, CI = confidence interval, DD = desire to drink, EF = enjoyment of food, EOE = emotional over-eating, EUE = emotional under-eating, FF = food fussiness, FR = food responsiveness, SD = standard deviation, SE = slowness in eating, SR = satiety responsiveness.

There was a significant mean difference in desire to drink (DD) between boys and girls ( $t(118)=7.086, P<.001$ ). The boys ( $12.46 \pm 1.93$ ; 95% CI=11.89–13.05) tended to drink more than girls ( $10.23 \pm 1.15$ , 95% CI=9.96–10.49). (See Table 2).

There was a significant mean difference in emotional under-eating (EUE) between boys and girls ( $t(118)=-4.339, P<.001$ ). Here, the boys ( $15.46 \pm 2.15$ , 95% CI=14.82–16.11) seemed less of emotional under-eaters than girls ( $17.12 \pm 1.74$ , 95% CI=16.71–17.51). (See Table 2).

There was a significant mean difference in emotional over-eating (EOE) between boys and girls ( $t(118)=5.184, P<.001$ ). The boys ( $15.40 \pm 2.24$ , 95% CI=14.73–16.07) tended to be more of emotional overeaters than girls ( $13.41 \pm 1.63$ , 95% CI=13.04–13.79). (See Table 2). Thus, our results suggest that gender significantly affects the eating habits of school children.

#### 4. Discussion

This is a cross-sectional study that aimed to investigate whether gender affects the eating habits of Nigerian school children using their parents' ratings. To begin with, this study results revealed that boys tended to be less responsive to food than girls. This result is consistent with previous research which observed that gender contributes to individual differences in eating habits such as food responsiveness,<sup>[20]</sup> and that dysfunctional eating habits could be significantly linked to gender.<sup>[14]</sup> Similar to previous findings,<sup>[15,21]</sup> our study further found that boys tended to be fussier with food than girls. While some authors<sup>[22]</sup> reported that boys scored significantly lower than girls in food fussiness, others demonstrated that fussy eating affects girls and boys in a similar manner.<sup>[21,23]</sup> Results from our study also show that girls tended to be slower in eating than boys, as previous studies<sup>[24–26]</sup> have reported a similar trend in the eating habits of boys and girls.

The current study showed that boys tended to be more satiety responsive to food than girls. Similarly, previous studies<sup>[21,26]</sup> have also recorded such outcomes. In line with previous studies,<sup>[21,25]</sup> the current study revealed that boys tended to enjoy food more than girls. However, for some researchers, children's general demonstration of food behavior is highest on

the enjoyment of food.<sup>[27,28]</sup> The current study further shows that boys tended to drink more than girls, as demonstrated in prior research.<sup>[25]</sup> But some previous research<sup>[21]</sup> also revealed that girls tended to drink more than boys. Regarding emotional under-eating, we found that boys were less emotional under-eaters than girls, which is supported by the previous research.<sup>[25]</sup> The current study also identified that boys seemed to be more emotional overeaters than girls, as in past research.<sup>[21]</sup> For emotional eaters, parents often use food as a non-responsive, parent-centered tool to either comfort, distract, calm or shape their behavior.<sup>[29]</sup> This approach does not promote healthy food preferences and appetite regulation in children.<sup>[29]</sup>

The implications of our study for nutritional counselling and education cannot be overemphasized. Adequate nutrition is globally emphasized as human right.<sup>[30]</sup> Because of the recognition of the benefits of healthy eating habits by dietary experts and its consideration as a means of mitigating malnutrition, it has some implications for nutritional counselling. While interdisciplinary responses to promote healthy eating habits are crucial, nutritional counselling and education can provide an avenue for inculcating a healthy eating habit in school children. As gender influences the eating behavior of children,<sup>[31]</sup> a gender-sensitive nutritional counselling approach can be adopted to promote healthy eating habits among school children. As pointed out by previous research,<sup>[32]</sup> gender-specific approaches are required to encourage healthy eating behavior in the student population. As a previous study demonstrated gender-specific differences concerning eating habits, food taste and relationship with food, the authors also suggested the development of gender-specific programs for the promotion of a healthy lifestyle.<sup>[33]</sup>

This study has some limitations worth taking note of. First, the study only provided data concerning the effect of gender on eating habits of Nigerian primary school children using parents' reports. Other important variables that might affect children's eating habits, such as caregiver's educational attainment, children's physical location, household food culture, family size, and age were not examined. Future research should explore the role of these variables in children's eating habits using other sources of data such as interviews, teacher ratings, siblings-ratings, peer

ratings, and self-ratings. Also, the sample size used was small; thus, the results may not be generalizable to the entire population of primary school children. Another limitation is our inability to establish causation among the variables in that this was a cross-sectional survey. Causal studies are required to address this limitation in the future.

Finally, there might have been parental bias in answering questions on behalf of their children. Thus, it is possible that being a parent (father or mother) might have affected the quality of responses to the questions in the CEBQ. Future studies should adopt data collection and analytic strategies that can help reduce parental bias in responding to questions about children's eating habits. Researchers have indicated that parental factors influence the development of healthy and unhealthy eating habits in children.<sup>[34,35]</sup> For instance, parental practices such as active and restrictive guidance have been shown to influence the eating habits of children; active guidance could promote healthy eating habits whereas restrictive guidance could discourage unhealthy eating habits.<sup>[34]</sup> Thus, it has been observed that there is a need for early feeding interventions to enable parents to clearly understand children's eating behavior and encourage effective food parenting.<sup>[29]</sup> Increased parental awareness about good feeding practices can also help minimize unhealthy eating habits in this population because parents often determine the type and quantity of food and the time that food is given to their children.<sup>[35]</sup>

## 5. Conclusion

The study showed that gender had a significant effect on the eating habits of school children. Thus, gender is an important factor to be considered when aiming to improve the eating habits of Nigerian school children. Gender-sensitive interventions should aim at teaching and encouraging healthy eating habits among school children.

## Author contributions

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## References

- [1] Ahmad Z, Daw WK, Isa AR. Breastfeeding and weaning practices in rural communities of Kelantan. *Malays J Nutr* 1996;2:148–54.
- [2] Ene-Obong H, Ibeanu V, Onuoha N, et al. Prevalence of overweight, obesity, and thinness among urban school-aged children and adolescents in southern Nigeria. *Food Nutr Bull* 2012;33:242–50.
- [3] Ergin F, Okyay P, Atasoylu G, et al. Nutritional status and risk factors of chronic malnutrition in children under five years of age in Aydin, a western city of Turkey. *Turk J Pediatr* 2007;49:283–9.
- [4] Kumar D, Goel NK, Mittal PC, et al. Influence of infant-feeding practices on nutritional status of under-five children. *Indian J Pediatr* 2006; 73:417–21.
- [5] Shamim S, Naz F, Jamalvi SW, et al. Effect of weaning period on nutritional status of children. *J Coll Physicians Surg Pak* 2006;16: 529–31.

- [6] Simon VGN, Souza JMPde, Souza SBde. Breastfeeding, complementary feeding, overweight and obesity in pre-school children. *Rev Saude Publica* 2009;43:60–9.
- [7] Umeokonkwo AA, Ibekwe MU, Umeokonkwo CD, et al. Nutritional status of school age children in Abakaliki metropolis, Ebonyi State, Nigeria. *BMC Pediatr* 2020;20:1–9.
- [8] Okeighben SA. The prevalence of dental caries among 12 to 15-year-old school children in Nigeria: report of a local survey and campaign. *Oral Health Prev Dent* 2004;2:27–31.
- [9] Sathyamala C. Global nutrition report: towards a global governance in nutrition. *Dev Change* 2017;48:1227–42.
- [10] UNICEF, WHO, and World Bank Group (2015). Levels and trends in child malnutrition: UNICEF-WHO-World Bank Group joint child malnutrition estimates: key findings of the 2015 edition. New York, USA: United Nations Children's Fund; Geneva, Switzerland: World Health Organization; Washington (DC), USA: The World Bank. World Health Organ World Bank Group.
- [11] Senbanjo IO, Adejuyigbe EA. Prevalence of overweight and obesity in Nigerian preschool children. *Nutr Health* 2007;18:391–9.
- [12] Ajayi EO, Elechi HA, Alhaji MA. Prevalence of overweight/obesity among primary school pupils in Urban Centre, Nigeria. *Saudi J Obes* 2015;3:59.
- [13] Musa DI, Toriola AL, Monyeke MA, et al. Prevalence of childhood and adolescent overweight and obesity in Benue State, Nigeria. *Trop Med Int Health* 2012;17:1369–75.
- [14] Fadipe B, Oyelohunnu MA, Olagunju AT, et al. Disordered eating attitudes: demographic and clinico-anthropometric correlates among a sample of Nigerian students. *Afr Health Sci* 2017;17:513–23.
- [15] Wardle J, Guthrie CA, Sanderson S, et al. Development of the children's eating behaviour questionnaire. *J Child Psychol Psychiatry* 2001;42:963–70.
- [16] Umoke M, Umoke PCI, Onyeke N, et al. Influence of parental education levels on eating habits of pupils in Nigerian primary schools. *Medicine (Baltimore)* 2020;99:e22953.
- [17] National Population Commission. Population and housing census of the Federal Republic of Nigeria; 2006:1. Available from: <https://catalog.ihns.org/catalog/3340>. Accessed March 1, 2019.
- [18] Faul F, Erdfelder E, Buchner A, et al. Statistical power analyses using G\* Power 3.1: tests for correlation and regression analyses. *Behav Res Methods* 2009;41:1149–60.
- [19] Viana V, Sinde S, Saxton JC. Children's Eating Behaviour Questionnaire: associations with BMI in Portuguese children. *Br J Nutr* 2008;100:445–50.
- [20] Lipowska M, Lipowski M, Jurek P, et al. Gender and body-fat status as predictors of parental feeding styles and children's nutritional knowledge, eating habits and behaviours. *Int J Environ Res Public Health* 2018;15:852.
- [21] Sleddens EF, Kremers SP, Thijs C. The Children's Eating Behaviour Questionnaire: factorial validity and association with Body Mass Index in Dutch children aged 6–7. *Int J Behav Nutr Phys Act* 2008;5:49.
- [22] Cao Y-T, Svensson V, Marcus C, et al. Eating behaviour patterns in Chinese children aged 12–18 months and association with relative weight-factorial validation of the Children's Eating Behaviour Questionnaire. *Int J Behav Nutr Phys Act* 2012;9:5.
- [23] Moroshko I, Brennan L. Maternal controlling feeding behaviours and child eating in preschool-aged children. *Nutr Diet* 2013;70:49–53.
- [24] Laessle RG, Lehrke S. Differences in laboratory eating behaviour between overweight boys and girls before treatment. *Eat Weight Disord-Stud Anorex Bulim Obes* 2012;17:e137–9.
- [25] Sirirassamee T, Hunchangsinh P. Children's eating behavior questionnaire: Factorial validation and differences in sex and educational level in Thai school-age children. *Southeast Asian J Trop Med Public Health* 2016;47:1325–34.
- [26] Obregón AM, Valladares M, Goldfield G. Association of the dopamine D2 receptor rs1800497 polymorphism and eating behavior in Chilean children. *Nutrition* 2017;35:139–45.
- [27] van Strien T, Oosterveld P. The children's DEBQ for assessment of restrained, emotional, and external eating in 7-to 12-year-old children. *Int J Eat Disord* 2008;41:72–81.
- [28] Trudeau F, Shephard RJ. Physical education, school physical activity, school sports and academic performance. *Int J Behav Nutr Phys Act* 2008;5:10.
- [29] Daniels LA. Feeding practices and parenting: a pathway to child health and family happiness. *Ann Nutr Metab* 2019;74:29–42.
- [30] Scrimshaw NS. A supplementation and control of vitamin A deficiency. *Food Nutr Bull Spec Issue Vitam A* 2001;22:235–340.
- [31] Svensson V, Lundborg L, Cao Y, et al. Obesity related eating behaviour patterns in Swedish preschool children and association with age, gender, relative weight and parental weight-factorial validation of the Children's Eating Behaviour Questionnaire. *Int J Behav Nutr Phys Act* 2011;8:134.
- [32] Alkazemi D. Gender differences in weight status, dietary habits, and health attitudes among college students in Kuwait: a cross-sectional study. *Nutr Health* 2019;25:75–84.
- [33] Lombardo M, Aulisa G, Padua E, et al. Gender differences in taste and foods habits. *Nutr Food Sci* 2019;50:229–39.
- [34] Yee AZ, Lwin MO, Ho SS. The influence of parental practices on child promotive and preventive food consumption behaviors: a systematic review and meta-analysis. *Int J Behav Nutr Phys Act* 2017;14:1–4.
- [35] Mitchell GL, Farrow C, Haycraft E, et al. Parental influences on children's eating behaviour and characteristics of successful parent-focussed interventions. *Appetite* 2013;60:85–94.