

# Breakfast habit and nutritional status of undergraduates in Ekiti state, Nigeria

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**Abstract:** The study was carried out to assess the breakfast consumption habit and nutritional status of undergraduates in Ekiti State, Nigeria. Two hundred and fifty students comprising of 186 female and 64 male were randomly selected in two higher institutions. A self administered questionnaire which elicits information on socio-demographic data and breakfast habit of the students was used. Nutrients intake of the respondents was assessed using 24 hour dietary recall while the Body Mass Index (BMI) was used to assess the nutritional status of the respondents. The result revealed that 76.2% of the respondents were female while 23.8% were male. Slightly above average (52.8%) were within the age range of 16-20 years while 36.8% received more than ₦10, 000 as feeding allowances. In general, 52% of the students reported not to be taking breakfast on the day of the survey and 40.8% attributed this to insufficient feeding allowances. Nutritional status assessment showed that there was no significant difference ( $X^2=4.16$ ;  $P=0.24$ ) between breakfast skipping and BMI. The 24 hour dietary analysis showed that there was a significant ( $P<0.05$ ) difference between the mean protein and fat intake of breakfast skippers and eaters. The mean nutrients intake of breakfast skippers and eaters were; energy (2315.4kcal vs 2229.6kcal), protein (52.6g vs 58.4g), fat (42.1g vs 33.0g), carbohydrate (324.3g vs 306.3g), iron (12.4mg vs 12.6mg), and calcium (1106.2mg vs 1157.9mg). The study concluded majority of the students' skip breakfast, a reflection of insufficient feeding allowances, busy schedule and weight control measures. The study then recommends that parents should increase the feeding allowances of their children that are in tertiary institutions.

**Keywords:** Breakfast Habit, Nutrition, Body Mass Index, Undergraduate

## 1. Introduction

Eating behaviors, such as consuming breakfast has been associated with intakes of nutrients as well as body weight [1]. Studies have concluded that breakfast consumption has an important impact on nutritional status [2, 3], it has been suggested that breakfast meal is an important dietary factor for energy regulation. Increased snacking, sedentary lifestyle and obesity have been found to be common among those who skip breakfast than the breakfast eaters [4, 5]. Breakfast consumption was also suggested to have potential effect on the treatment of binge eating disorder [6]. Furthermore, research has linked the consumption of breakfast with adolescents' mental and physical health [7, 8]. Students who consumed breakfast were likely to experience mental stress

and were more likely to get better grades and better school attendance. On the other hand, skipping breakfast has been linked with adverse effect on the cognition, school attendance, psychosocial function, and mood in young adult and children [9]. Factors such as emergence of fast food outlets, shopping malls, convenience stores and high cost of healthy meal has contributed to the unhealthy eating habits among university students [10], and lack of knowledge of healthy food choices may negatively affect nutritional status and eating habits [2]. University students often pay little attention to breakfast, with some missing breakfast because it takes too much time to prepare [11]. In Nigerian universities, it has been observed that most students lack fund or divert their pocket or feeding money to other frivolities and so skip meals including breakfast and there are no central feeding

facilities for students in the university campuses, so the students are forced to take responsibility for their feeding. [12]. These can therefore lead to malnutrition, if the students are not educated properly on the importance of adequate nutrients intake. Even though the association between breakfast habit and obesity are widely studied, few or no research has been conducted in the study area. To this end, this study assesses the relationship between the breakfast consumption habit and nutritional status of the undergraduates in Ekiti state, Nigeria.

## 2. Material and Methods

This study was a descriptive survey assessing the breakfast consumption habit and nutritional status of students (undergraduates) in Ekiti State. A total of 250 students from two public tertiary institutions were sampled using a convenience sampling method. Informed consents were sought from the young adult (students) who are willing to participate prior to the collection of the data. Semi structured self administered questionnaire was used to obtain information on socio-demographic, breakfast habit (breakfast was defined as any foods or drinks eaten between the hour of 8am and 10 am) and factors associated with breakfast skipping. Anthropometric measurements such as, weight and height were obtained to assess the nutritional status. Height was measured to the nearest 0.1cm using wall meter rule, while their weight was measured with light clothing on using a portable bathroom scale. The WHO [13] was used to classify subjects as underweight, normal weight, overweight and obese. The 24 hour dietary recall method was used to assess the nutrients intake of the students. The students were asked to recall all the foods, snacks and beverages consumed in the previous 24 hour (hr) prior to the interview. Food intakes were converted to nutrients using food composition table. All statistical analysis was carried out using SPSS for window version 16.0, categorical variables results are presented as the frequency and percentage while continuous variables results are presented as the mean  $\pm$  SD. Chi-squared test was used for categorical variables while independent t-test was used for continuous variables. Significance level was set at  $p < 0.05$ .

## 3. Results

Table 1 showed the socio demographic characteristics of the undergraduates. Approximately, 74% were female while 26% were male, 52.8% were within the age range of 16-20 years and majority (92.8%) were single while 51.2% received between ₦2000-₦90000 as feeding allowances. Table 2 showed the breakfast habit and factors associated with breakfast skipping, slightly over half (52.0%) skips meal. Regarding the pattern of skipping, 21.5% skipped meal once per week while 30.8% skipped meal three times per week. The major factors identified for skipping breakfast were insufficient feeding allowances (40.8%) and busy

schedule (27.7%). The anthropometric measurements are described in table 3, Statistically there was a significant ( $X^2=8.69$ ;  $P<0.05$ ) difference between the nutritional status of male and female who skipped breakfast, 11.1% of male who skipped breakfast were underweight while 33.3% had normal weight status. Approximately 60% of female who skipped breakfast had normal weight status while 7.4% were obese. For breakfast eaters, 42.9% (male) and 72.8% (female) had normal weight status while 50.0% and 10.9% male and female students were overweight respectively. Table 4 showed the nutrients intake of the undergraduates. The mean energy intake was 2315.4 kcal  $\pm$  316.1 and 2229.6 kcal  $\pm$  499.1 for breakfast skippers and eaters respectively; also protein intake was 52.6g $\pm$ 11.8 and 58.4g $\pm$ 19.3 for breakfast skippers and eaters respectively. There was a significant ( $P<0.05$ ) difference between the fat intake of breakfast skippers (42.1 $\pm$ 9.9g) and breakfast eaters (33.0 $\pm$ 6.7g). Calcium intake was 1106.2mg and 1157.9mg for breakfast skippers and eaters respectively.

## 4. Discussion

This research assesses the nutritional status as well as the breakfast habit of the undergraduates in Ekiti State, Nigeria as breakfast was believed to be an important meal of the day, providing energy and increase productivity during the morning [14]. The main finding of this study indicates that slightly above average (52%) skip breakfast or had infrequent breakfast consumption. This finding was higher in comparison with previous studies; the study conducted among undergraduates in university in Kuala, Malaysia showed that 29.2% skipped breakfast [5], similar study conducted by Tanaka et al. [15] showed that 35.4% skipped breakfast meal, 31.5% of adolescents skipped breakfast in a study conducted by Priya et al. [16], the prevalence of breakfast skipping among students studying traditional Chinese medicine and Mongolian medicine was 22.7% [17], while it was 44.9% among undergraduates of Federal University of Agriculture Abeokuta, Nigeria [18]. Quite a high number of female participants skipped breakfast more than male counterpart, perhaps the female are more concern with their body image, that is, fear of being overweight and obese. This is similar with the previous studies that linked meals skipping to concern about body image among adolescent girls [19-22]. The reasons cited by the students for skipping breakfast were inadequate feeding allowances or pocket money and busy schedules. Inadequate monthly allowances may lead to missed meals and intake of low nutritional value foods which may in turn impair cognitive function. Rampersaud et al. [9]; Pollitt and Mathews [23] assert that breakfast consumption improves school attendance and enhances the quality of the students' diets. Though several research has linked breakfast skipping to overeating and obesity [5, 22, 24-25], this study revealed that there was no significant difference ( $X^2=4.16$ ;  $P=0.24$ ) between breakfast skipping and nutritional status of the

undergraduates. This study contradict the findings of Harding *et al.* [26], they found an association between breakfast skipping and obesity among adolescents in the United Kingdom but this study is consistent with other studies in children and adolescents from Australia and Saudi Arabia that there was no significant association between infrequent breakfast consumption, and body composition in male and female adolescents [27, 28]. In this study, some of the breakfast skippers still have normal nutritional status just like those that did not skipped; this may mean that breakfast skippers have an alternative means, such as eating fast-food meal which tend to be high in sugar, fat and low in fiber. Breakfast skippers have higher energy and fat intake, lower intake of calcium and iron than breakfast eaters, breakfast skippers are reported to have higher daily intakes of energy, fat, cholesterol, lower intakes of vitamins, and minerals in contrast to breakfast eaters, thereby increasing the likelihood of gastrointestinal disease later in life [29].

## 5. Conclusion and Recommendation

The study concluded majority of the students' skip breakfast, an indication of insufficient feeding allowance/pocket money, busy schedule and weight control measures. The study then recommends that parents should improve or increase the feeding allowances of their wards that are in higher learning institutions. Also, undergraduates should be educated about healthy eating behaviors in order to prevent risk of obesity and related metabolic consequences in future.

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## Authors' Contributions

OAA conceived, designed the study and wrote the first draft, RMA and OO collected the data. OAA supervised the data collection. QJA performed the statistical analysis. All authors edited and approved the final version of the manuscript.

**Table 1.** Socio-demographic data of the respondents.

Characteristics	Frequency	Percentages (%)
Sex		
Male	64	25.6
Female	186	74.4
Age		
16-20yrs	132	52.8
21-25yrs	92	36.8
26yrs and above	26	10.4
Marital Status		
Married	18	7.2
Single	232	92.8
Pocket Money/Semester		
<₦2000	30	12.0
₦2000- ₦3000	30	12.0
₦4000- ₦6000	54	21.6
₦7000-₦90000	44	17.6
≥₦10000	92	36.8

**Table 2.** Respondents' breakfast habit and the associated factors.

Variables	Male	Female	Total
Do you skip breakfast?			
Yes	36(27.7)	94(72.3)	130(52.0)
No	28(23.3)	92(76.7)	120 (48.0)
How many times do you skip breakfast/ week?			
Once	9 (32.1)	19(67.9)	28(21.5)
Twice	10(35.7)	18(64.3)	28(21.5)
Thrice	13(32.5)	27(67.5)	40(30.8)
More than thrice	4(11.8)	30(88.2)	34(26.2)
Reasons for skipping Breakfast			
Busy schedule	10(27.8)	26(72.2)	36(27.7)
Fasting	0(0.0)	19(100.0)	19(14.6)
Insufficient feeding allowances	25(47.2)	28(52.8)	53(40.8)
Health reasons	0(0.0)	13(100.0)	13(10.0)
Lack of appetite	1(11.1)	8(88.9)	9(6.9)

Values are n (%)

**Table 3.** Breakfast habit and nutritional status of the respondents.

	Breakfast skippers		Breakfast eaters		Total	
	Male	Female	Male	Female	Male	Female
Underweight (<18.5kg/m <sup>2</sup> )	4(11.1)	20(21.3)	0(0.0)	8(8.7)	4(6.3)	28(15.1)
Normal (18.5-24.9kg/m <sup>2</sup> )	12(33.3)	56(59.6)	12(42.9)	67(72.8)	24(37.5)	123(66.1)
Overweight (25-29.9kg/m <sup>2</sup> )	16(44.4)	16(17.0)	14(50.0)	10(10.9)	30(46.9)	26(14.0)
Obese (≥30kg/m <sup>2</sup> )	4(11.1)	7(7.4)	2(7.1)	2(2.2)	6(9.4)	9(4.8)
	X <sup>2</sup> =8.69; P<0.05		X <sup>2</sup> =6.89; P>0.05		X <sup>2</sup> =14.19; P<0.05	

Values are n (%)

Generally, there was no significant difference (X<sup>2</sup>=4.16; P=0.24) between breakfast skipping and nutritional status

**Table 4.** Mean nutrients intake of the respondents.

Nutrients	Breakfast skippers	Breakfast eaters
Energy (kcal)	2315.4±316.1	2229.6±499.1
Protein (g)*	52.6±11.8	58.4±19.3
Fat (g)*	42.1±9.9	33.0±6.7
Carbohydrate (g)	324.3±127.4	306.3±128.3
Iron (mg)	12.4±4.1	12.6±4.4
Calcium (mg)	1106.2±144.5	1157.9±177.5

Values are expressed as the means ± standard deviation

\*Independent t-test showed a significant difference at  $P < 0.05$  between two groups.

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