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Research Article

Meal Skipping Among Undergraduate Health and Allied Sciences Students in Sagamu, Nigeria

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ABSTRACT

Meal skipping is a documented unhealthy practice associated with obesity, poor dietary choices and development of chronic diseases. Undergraduate students are predisposed to skipping meals for several reasons. This study therefore determined the prevalence of meal skipping among students in Sagamu, Southwest Nigeria. A cross-sectional study was conducted among 350 undergraduate students of the College of Health Sciences, Olabisi Onabanjo University, Sagamu, Nigeria, selected via multi-stage sampling. Data were collected using a semi-structured, self-administered questionnaire, stadiometre and analyzed with SPSS 20.0. Relevant descriptive and inferential statistics were calculated, with level of significance (p) set at <0.05. Participation was fully voluntary. The mean age of respondents was 23.4 ±2.3 years. The proportion of students who skipped meals was 92%; breakfast was most frequently skipped (82.6%). Reasons for skipping meals included: busy schedules (82.3%); food rationing (16.3%); inability to cook (10%). Meal skipping was associated with poor concentration at school, mood swings, irritable behavior, reduced comprehension (p<0.05). Most (69.1%) respondents had a normal body mass index; only 6.9% of respondents were obese. Meal skipping was highly prevalent among undergraduate students in Sagamu. Adequate nutrition education on healthy eating and health promotion activities are necessary to reduce the prevalence of this unhealthy practice..

Keywords: meal, skipping, overweight, health, students, Sagamu

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INTRODUCTION

Sub-Saharan Africa is home to a teeming population of young people, with diverse health and health-related problems, including food and nutrition insecurity, poor health infrastructure and socio-economic inequity. This has slowed down the gains made by some countries in combating malnutrition, especially deficiency states as well as food and nutrition insecurity (Fanzo, 2012). The increasing burden of diet-related non-communicable diseases among young people, particularly those in the developing countries of sub-Saharan Africa and Asia, is a great cause for concern to the global health community. There is substantial evidence that many young people have abandoned the healthy indigenous diets for more westernized and refined diets (Popkin 2004). Several studies have demonstrated the coexistence of all forms of malnutrition among youth and young adults in the subregion, which are closely related to dietary and lifestyle choices, including physical activity levels (Otuneye *et al*, 2017; Nzeagwu & Akagu, 2017; Okafor *et al*, 2018; Al-Shehri *et al*, 2017; WHO, 2018). Young persons tend to exhibit dietary habits and meal patterns acquired in adolescence, which are

likely to persist throughout adulthood. Many of these habits and meal patterns are detrimental to their health and wellbeing. The increased intake of soft drinks, sugar-sweetened beverages, fast foods and convenience foods, with the accompanying decrease in physical activity, are often predominant while on the school campus (Afolabi *et al*, 2013; Pendergast, 2016; Al-Shehri *et al*, 2017). A major eating habit, widely acknowledged to be associated with such poor dietary habits is meal skipping (May *et al*, 2009; Afolabi *et al*, 2013; Omage & Omuemu, 2018).

Meal skipping has been widely documented among various populations within the West African sub-region, particularly among in-school adolescents and undergraduate students (Onyiriuka *et al*, 2013; Ackuaku - Dogbe & Abaidoo, 2014; Nzeagwu & Akagu, 2011; Otuneye *et al*, 2017; Omage & Omuemu, 2018). The prevalence of meal skipping among young people varies widely across sub-regions and within countries (Pendergast, 2016). Rates as high as 71.9% in Ghana (Ackuaku-Dogbe & Abaidoo, 2014), 66% in Najran, Saudi Arabia (Al-Shehri *et al*, 2017), 57% in Riyadh (Abdel-Megeid, 2011), 56% in southern Nigeria (Omage & Omuemu, 2018) are reported among undergraduate students. Young persons, particularly undergraduate students, are likely to skip meals for

a variety of reasons, including busy schedules, weight control, financial constraints, inability to cook, poor appetite and demands of schooling (Afolabi *et al*, 2013; Pendergast *et al*, 2016; Omage & Omuemu, 2018). Meal skipping has been shown to be associated with consumption of food of low nutritional value, reduced intake of fruits and vegetables and increased intake of high-calorie diet, sweetened beverages, alcoholic beverages, refined sugars, snacks and fast foods with high fat and sodium content (Pendergast, 2016; Kelishadi *et al*, 2017; Rodrigues, 2017). It has been documented to be associated with overweight and obesity in a study among adolescents in West Java, Indonesia (Augustina *et al*, 2020). This habit of meal skipping has the tendency of meeting young people's immediate hunger needs but exposing them to malnourishment and increased risk of developing non-communicable diseases particularly obesity, diabetes and high blood pressure (Rodrigues, 2017; Nas *et al*, 2017; St-Onge *et al*, 2017). Students in the college of health sciences of Olabisi Onabanjo University are mostly young persons and adults aged 17- 30 years. They are at risk of meal skipping like their counterparts in other fields of study within and outside Nigeria. To the best of our knowledge, no one has conducted a study to assess the pattern of meal skipping among this group of future health workers. This study therefore determined the pattern of meal skipping among undergraduate students of the College of Health Sciences, Olabisi Onabanjo University, Sagamu Campus, Ogun State.

MATERIALS AND METHODS

Study location: Sagamu is an urban town in the Ogun-East senatorial district of Ogun State, Nigeria. It is situated in the larger Sagamu Local Government Area (LGA), which is one of the twenty LGAs making up Ogun State in southwest Nigeria. The Obafemi Awolowo College of Health Sciences of Olabisi Onabanjo University (a state-owned tertiary institution) is situated in Sagamu Township and comprises two faculties: Basic Medical Sciences and Clinical Sciences. The Faculty of Pharmacy was carved out of the college about a decade ago. It is responsible for the training of undergraduate and postgraduate students in pharmacy.

The college is heterogeneous in terms of departments, student population and staff. A cross-sectional descriptive study was carried out among representative samples of undergraduate students of the Obafemi Awolowo College of Health Sciences, Olabisi Onabanjo University, Sagamu campus, Ogun State.

Participants: All registered undergraduate students of the college and Faculty of Pharmacy, were eligible for participation in the study. Only willing participants from their second to fifth years of study were recruited.

The sample size for the study was calculated using the formula for descriptive studies (Sholeye *et al*, 2017). The calculated sample size was rounded up to 350 to account for non-response of 20%.

Sampling: Multi-stage sampling technique was used for selection of study participants within Sagamu Campus. The first stage involved selection of four departments from the six

existing ones, which was closely followed by proportional allocation of the sample to be selected from each department. Stratification of students by year of study was done, followed by a proportionate allocation of respondents accordingly. Final selection of respondents was carried out by systematic sampling technique.

Data collection: Data collection was carried out with the aid of a semi-structured, interviewer-administered questionnaire, pre-tested at a college of health sciences of a university with similar characteristics as the study site. The questionnaire obtained information on socio-demographic characteristics, perception of meal skipping and the practice of meal skipping among respondents. Three trained research assistants were engaged for data collection. Respondents' height (in metres) and weight (in kg) were measured according to standard methods (Raimi & Dada, 2018). The body mass index (BMI) of respondents was calculated and reported in kg/m² according to the World Health Organization guideline (WHO, 2018). The questionnaires were checked for completeness. Data were analyzed using IBM SPSS version 20. Body mass index was categorized according to the World Health Organization (WHO) guideline. Frequencies, proportions and means were calculated. Chi square test and fisher's exact test were used to determine association between categorical variables, with level of significance (p) set at <0.05.

Participation was fully voluntary and participants free to withdraw from the study whenever they felt like doing so. Strict confidentiality was ensured throughout the study. Respondents' written informed consent was obtained prior to onset of the study.

Ethical consideration: Ethical approval was obtained from the health research ethics committee of Olabisi Onabanjo University Teaching Hospital.

RESULTS

Socio-demographic characteristics: The mean age of respondents was 23.4 ±2.3 years; 18 (5.1%) were aged 17-19 years; 236 (67.4%) were aged 20-24 years; 76 (21.7%) were aged 25-29 years. Males constituted 185 (52.9%) of respondents, females were 165 (47.1%). Three hundred and thirty-one (94.5%) were of the Yoruba ethnic group; 16 (4.6%) were Ibo; only 3 (0.9%) were from other ethnic groups; 332 (94.9%) were single; 261 (74.6%) were Christians; 84 (24.0%) were Muslims; while others belonged to other religions. Majority (73.4%) of respondents had mothers with tertiary education; only 32 (9.1%) respondents had mothers with no formal education. The monthly allowance of most (39.9%) respondents was less than 15,000 NGN (approximately \$500). (Table 1).

Perception of meal skipping:: Fifty-seven (16.3%) respondents felt meal skipping was a good practice; 183 (52.3%) felt meal skipping helped with weight control; 275 (78.6%) felt it had an adverse effect on health and; 212 (61.1%) felt meal skipping had negative mental health consequences.

Table 1:
Factors associated with meal skipping

Variable	Meal skipping		Test statistic	
	Yes (n=322)	No (n=28)		
Sex	Male	171 (53.0)	15 (53.6)	p= 0.962
	Female	151 (47.0)	13 (46.4)	
Course of study	Medicine	192 (59.5)	22 (78.6)	p=0.184
	Pharmacy	83 (25.9)	5 (17.8)	
	Physiology	19 (5.8)	1 (3.6)	
	Anatomy	28 (8.8)	0 (0.0)	
Monthly allowance	15,000 and below	165 (51.2)	8 (28.6)	p=0.079
	16,000 – 20,000	82 (25.5)	8 (28.6)	
	21,000 - 25,000	27 (8.4)	4 (14.2)	
	26,000 - 30,000	48 (14.9)	8 (28.6)	
Level of study	300	45 (14.0)	3 (10.7)	p=0.562
	400	80 (24.8)	5 (17.9)	
	500	197 (61.2)	20 (71.4)	
Body Mass Index	Underweight	15 (4.7)	0 (0.0)	p=0.679
	Normal	221 (68.6)	21 (75.0)	
	Overweight	64 (19.9)	5 (17.9)	
	Obese	22 (6.8)	2 (7.1)	
Forgetting things	Yes	173 (53.6)	3 (10.7)	p=0.001
	No	149 (46.4)	25 (89.3)	
Poor comprehension	Yes	95 (29.4)	0 (0.0)	p=0.002
	No	227 (70.6)	28 (100.0)	
Poor concentration	Yes	108 (33.4)	0 (0.0)	p=0.001
	No	214 (66.6)	28 (100.0)	
Irritable behavior	Yes	236 (73.3)	3 (10.7)	p=0.001
	No	86 (26.7)	25 (89.3)	
Had a reference	Yes	110 (34.2)	2 (7.1)	p=0.006
	No	212 (65.8)	26 (92.9)	

Table 2:
Association between body mass index and socio-demographic characteristics

Variable	Body Mass Index			Test statistics	
	Underweight (n=15)	Normal (n=242)	Overweight/obese (n=93)		
Age (years)	<20	2 (13.3)	6 (2.5)	10 (10.8)	p=0.001
	20 – 24	7 (46.7)	177 (73.1)	45 (48.4)	
	25 – 29	6 (40.0)	59 (24.4)	38 (40.8)	
Sex	Male	9 (60.0)	158 (65.3)	23 (24.7)	p=0.001
	Female	6 (40.0)	84 (34.7)	70 (75.3)	
Course of study	Medicine	7 (46.7)	129 (53.5)	58 (62.5)	p=0.001
	Pharmacy	8 (53.3)	55 (22.6)	31 (33.1)	
	Physiology	0 (0.0)	14 (5.7)	4 (4.4)	
	Anatomy	0 (0.0)	44 (18.2)	0 (0.0)	
Monthly allowance	15, 000 and below	4 (26.7)	138 (57.0)	45 (48.3)	p=0.017
	16,0000-20,000	7 (46.6)	47 (19.4)	29 (31.2)	
	21,000-25,0000	4 (26.7)	29 (12.0)	12 (12.6)	
	26,000 -30,000	0 (0.0)	28 (11.6)	7 (7.9)	
Maternal education	No formal	0(0.0)	47 (19.5)	0 (0.0)	p=0.001
	Primary	2(13.3)	6 (2.5)	17 (17.8)	
	Secondary	2 (13.3)	29 (12.0)	12 (13.3)	
	Tertiary	11 (73.4)	160 (66.0)	64 (68.9)	

Meal pattern and related issues: Two hundred and eighteen (62.3%) respondents had two meals daily; 7 (2.0%) respondents ate once daily; others (35.7%) ate three or more times a day in the last three months. Three hundred and twenty-six (92.9%) respondents were responsible for cooking their own meals. Snacking was reported by 319 (91.1%) respondents; of these, 154 (48.3%) snacked regularly.

As many as 322 (92%) respondents skipped at least one meal in the preceding week; it was a regular occurrence among 304 (86.9%) respondents. Breakfast was regularly missed by 289 (82.6%) respondents; dinner by 27 (10.6%) respondents and lunch by 6 (1.7%) respondents. Reasons for regular meal skipping include: busy schedule (82.3%); food rationing (16.3%); weight control measures (9.4%); unable to cook (10%); lack of appetite (6.9%); no food at home (12.8%). A feeling of being overweight was reported by 102 (29.1%) respondents; while 86 (24.6%) tried various weight reduction strategies.

Reported consequences of meal skipping among respondents include: attention deficit (33.4%); reduced comprehension (29.4%); forgetfulness (32.0%); feeling very low or downcast (62.3%); irritable behavior and anger (68.3%).

Meal skipping was associated with the following: difficulty with concentration ($p=0.001$); amnesia ($p=0.001$); difficulty in comprehension ($p=0.002$); mood swings ($p<0.001$); having a reference ($p=0.006$); irritable behavior ($p=0.001$). It was not associated with: age ($p=0.854$); sex ($p=0.962$); course of study ($p=0.184$); level of study ($p=0.562$); monthly allowance ($p=0.079$); maternal education and BMI ($p=0.079$). (Table 1)

Body mass index: 15(4.3 %) were underweight; 242(69.1%) had normal BMI values; 69(19.7%) were overweight; while 24(6.9%) were obese. BMI was associated with the following: age of respondents ($p=0.001$); sex ($p=0.001$); marital status ($p=0.016$); course of study ($p=0.001$); monthly allowance ($p=0.017$) and maternal education ($p=0.001$). (Table 2).

DISCUSSION

Feeding habits play a major role in ensuring optimal nutrition and health status in individuals and communities. Dietary habits and other lifestyle choices, are well documented factors influencing the nutritional status and overall health of individuals, families and population group (Khan *et al*, 2016; Abdel-Megeid *et al*, 2011).

The proportion of respondents who skipped meals in this study is very high and consistent with findings from a systematic review on meal skipping among young adults (Pendergast, 2016). This may be reflective of the new lifestyles and adjustment to independent living which many of them, particularly students, consciously or inadvertently adopt while on the university campus (Al-Shehri *et al*, 2017; Alghamdi *et al*, 2018). It is however much higher than the prevalence reported by researchers in southwest Nigeria (Afolabi *et al*, 2013), southeastern Nigeria (Okafor *et al*, 2018; Nzeagwu & Akagu, 2011; Achinihu, 2009), the Niger Delta region (Omega & Omuemu, 2018) and in Saudi Arabia (Abdel-Megeid *et al*, 2011; Al-Shehri *et al*, 2017). The

observed marked difference in the prevalence of meal skipping between this study and previous studies in Nigeria, may be due to the diverse nature of participants in those studies in contrast to the restriction to only students of the college of health sciences recruited in this study, who may have busier schedules. The observed difference in meal skipping prevalence between this study and that from Najran, Saudi Arabia may be as a result of the restriction of participants in that study to only male undergraduate students of the university (Al-Shehri *et al*, 2017). In Ghana, the prevalence of meal skipping among medical students was slightly lower than that from this study (Ackuaku-Dogbe & Abaidoo, 2014).

Breakfast being the most skipped meal by respondents is consistent with findings from previous studies within and outside West Africa (Vibhute *et al*, 2018; Pendergast, 2016; Nzeagwu & Akagu, 2011; Otuneye *et al*, 2017; Moy *et al*, 2009; Achinihu, 2009; Okafor *et al*, 2018; Omega & Omuemu, 2018). The proportion of respondents who regularly skipped breakfast in this study is slightly higher than that reported among medical students in Ghana (Ackuaku-Dogbe & Abaidoo, 2014). It is however markedly higher than that among medical students in India (Vibhute *et al*, 2018) and undergraduates in Kuala Lumpur (Moy *et al*, 2009). The high proportion of breakfast skipping in this study buttresses findings from Kuala Lumpur where a higher tendency to skip breakfast was recorded among students who resided in hostels and rented apartments, which is also the predominant residential arrangement for undergraduate students in Sagamu (Moy *et al*, 2009).

Several reasons have been postulated for skipping meals by university students and adolescents in different countries. Studies within and outside Nigeria have consistently identified time constraint and busy schedules as major reasons for meal skipping in agreement with findings from this study (Dzatse *et al*, 2017; Pendergast, 2016; Afolabi *et al*, 2013; Okafor *et al*, 2018; Ackuaku-Dogbe & Abaidoo, 2014; Moy *et al*, 2009; Vibhute *et al*, 2018; Nzeagwu & Akagu, 2011). However the proportions of respondents whose busy schedules made them skip meals were lower in those studies, compared to this, in which over four-fifths of respondents were affected, with the exception of a cross-sectional study among male Ghanaian students (Dzatse *et al*, 2017),

Similar to findings by researchers in Abeokuta (Afolabi *et al* 2013), a few respondents (10%) in this study skipped meals because they were unable to cook. This is in agreement with the position of researchers that some university students have a challenge adjusting to life on campus, including meal patterns and other lifestyle choices (Al-Shehri *et al*, 2017; Dzatse *et al*, 2017; Moy *et al*, 2009). Reliance on food vendors and street foods may ultimately increase the likelihood of skipping meals, particularly if the food is delayed or lecture schedules are altered (Ackuaku-Dogbe & Abaidoo, 2014). Financial constraint is a well-documented cause of irregular and infrequent meals among university students. This was also reflected in the response of our study participants (Achinihu, 2009; Ackuaku-Dogbe & Abaidoo, 2014). Oftentimes, unhealthy snacks are cheaper and easily available on the streets and on campus. This may then seem a good alternative to a proper meal for the student with very limited funds. The

very high prevalence of snacking in this study may have been precipitated by the common practice of meal skipping. It is in agreement with previous studies which reported a high level of snacking and fast foods consumption among students and other young people, particularly those who skip meals (Afolabi *et al*, 2014; Otuneye *et al*, 2017; Al-Shehri *et al*, 2017; Omage & Omuemu, 2018). The nutrient inadequacy and unhealthy dietary practices associated with regular meal skipping is of great concern, particularly with the attendant public health consequences of under-nutrition coexisting with over-nutrition, as seen among populations in many developing countries (Dzatse *et al*, 2017; Moy *et al*, 2009; Nzeagwu & Akagu, 2011). Regular intake of healthy meals is an evidence-based health promoting activity, which is sustainable in the university community. Therefore improving access to healthy meals, as well as fruits and vegetables on campus, will go a long way in ensuring that fewer students skip meals.

In contrast to previous studies conducted in Ghana (Ackuaku-Dogbe & Abaidoo, 2014) and Kuala-Lumpur (Moy *et al*, 2009), age, course of study and class (level of study) were not associated with meal skipping. Although more males than females skipped meals in this study, there was no significant difference between males and females in contrast with findings from a previous study in Ghana (Ackuaku-Dogbe & Abaidoo, 2014). It is however similar to the reports of researchers in Abeokuta, Nigeria, where a higher proportion of males skipped meals (Afolabi *et al*, 2014). The association between meal skipping and poor concentration, irritable behavior as well as reduced comprehension, in this study, emphasize the key role of adequate nutrition in the overall wellbeing of an individual. This could have grave consequences on the academic performance and psychosocial wellbeing of the concerned students. Consistent skipping of meals may also predispose the students to medical conditions including dyspepsia and associated disorders, peptic ulcer disease and other gastro-intestinal disorders.

The growing concern about obesity and its adverse effects among adolescents and young people are well documented in literature (Augustina *et al*, 2020; Otuneye *et al*, 2017; Nzeagwu & Akagu, 2011; Vibhute *et al*, 2018). The proportion of overweight and obese students in this study is similar to findings from previous studies conducted among undergraduates in Riyadh (Abdel-Megeid *et al*, 2011), Najran (Al-Shehri *et al*, 2017) and Abia, Nigeria (Nzeagwu & Akagu, 2011). It is however much higher than the values reported by researchers in the southern part of Nigeria (Omage & Omuemu, 2018) and India (Vibhute *et al*, 2018). A study conducted in Nsukka, south-eastern Nigeria, found more than 40% of undergraduate students to be overweight (Okafor *et al*, 2018), while another one among medical students in Lahore, reported a far higher prevalence of obesity than our study (Khan *et al*, 2016). Similar to findings from southeastern Nigeria, body mass index was associated with respondents' monthly allowance (Okafor *et al*, 2018). This may imply that having more money encouraged unhealthy eating among students. Since obesity is a modifiable risk factor for many chronic diseases in adulthood, concerted efforts at its effective control will result in substantial economic and developmental gains. The public health implications of non-communicable diseases in young adulthood are enormous and far-reaching

for developing countries like Nigeria, particularly with fragile health systems.

Health promotion and lifestyle modification measures need to be top priorities for school health interventions and on university campuses. Meal skipping, unhealthy snacking and obesity need to be addressed as unsafe dietary and lifestyle issues among adolescents and young adults, using the school environment as a safe place for interventions (Augustina *et al*, 2020). Since inadequate intake of fruits and vegetables has been associated with meal skipping as well as onset of chronic diseases (Abdel-Megeid *et al*, 2011; Dzatse *et al*, 2017), there is a need to empower young adults, particularly university undergraduates, to take charge of their own health through healthy dietary and lifestyle choices,

Even though this study involved only students of the college of health sciences and may not be totally representative of the general population of young adults in Sagamu, the findings depict the meal pattern of undergraduate students and several other young adults along with its associated factors. The study was cross-sectional in design and could not make inferences on causality. However, the findings demonstrate a need for concerted efforts at addressing the practice of meal skipping and its predisposing factors on university campuses. A detailed qualitative study may be conducted to adequately explore some of the predisposing factors to meal skipping among respondents.

In conclusion, Meal skipping was a very common occurrence among students of the College of Health Sciences, Olabisi Onabanjo University. It was associated with poor academic performance, irritable behavior, reduced comprehension, amnesia and poor concentration. Nutrition education measures among student populations in southwest Nigeria are advocated to bring about the desired sustainable behavior change.

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