BREAKFAST CONSUMPTION PATTERN AND NUTRITIONAL STATUS AMONG IN-SCHOOL ADOLESCENTS IN IBADAN NORTH LOCAL GOVERNMENT AREA OYO STATE, NIGERIA

BY

Aishat Ajoke ABIOLA
B.SC HUMAN PHYSIOLOGY (UNILAG)
MATRIC NO: 188655

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DEDICATION

This research work is dedicated to Almighty Allah for His abundant blessings and for seeing me through this programme, and to my loving Parents, Alhaji and Mrs Abiola for their support financially and spiritually during the programme.

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ABSTRACT

Most adolescents skip breakfast despite its advantages in providing energy and nutrient intake and contributing to high cognition and academic performance. Research on breakfast consumption among adolescents has solely focused on students in high income countries but information is scanty among in-school adolescents in low income countries like Nigeria. Therefore, this study investigated the pattern of breakfast consumption and nutritional status among in- school adolescents in secondary schools in Ibadan North Local Government Area, Oyo State. Nigeria.

The study design was a descriptive cross-sectional survey and multistage random sampling was used to select 299 students from 13 registered secondary schools (6 public and 7 private schools) in Ibadan North. The study was conducted using a pretested semi-structured self-administered questionnaire which contained 8-point knowledge scale, 11-point perception scale, 24-point breakfast consumption pattern scale, questions relating to factors influencing breakfast consumption pattern and nutritional status using Body Mass Index was used for data collection. Knowledge scores 0-4 and >4 were classified as poor and good respectively, perception scores 0-5 and >5 were classified as poor and good respectively, breakfast consumption pattern scores 0-12 and >12 were classified as unhealthy and healthy breakfast consumption pattern respectively while nutritional status was classified using the World Health Organisation classification (underweight: <18.50, normal: 18.50-24.99, overweight: >=25.00 and obese: >=30.00. The data were cleaned, coded and analysed using descriptive statistics and inferential statistics such as Chi square at $p<0.05$.

Results indicated that majority (32.8%) of the respondents were aged 15 years and 36.5% consumed breakfast daily. Nearly half 48.8% reportedly consumed ready-to-eat cereals for breakfast daily and 11.7% eat cooked noodles. Majority (93.6%) of those that consumed breakfast did so to boost their academic performance. A higher proportion of all respondents (63.5%) had infrequent breakfast consumption. Waking up late (51.2%), lack of appetite (39.8%) desire to lose weight (46.8%) and busy schedule (lack of time) (38.5%) were major reasons attributed for skipping breakfast. Two thirds (66.6%) and slightly above half (52.8%) of the respondents had good knowledge and good perception of the health benefits of breakfast consumption respectively. Overall nutritional status of the respondents indicated underweight (17.7%), overweight (30.4%), obese (1.7%) and normal weight (50.2%). Respondents who reportedly consumed healthy breakfast showed better nutritional status as 38.8% had normal weight compared with 11.4% of those that consumed unhealthy

breakfast. Statistical significant (P< 0.001) relationship exists between breakfast consumption pattern and nutritional status. More than half (57.8%) of the respondents recommended that school breakfast programme should be organized by schools, benefits and negative health effects associated with consuming and skipping breakfast to encourage breakfast consumption practices.

There is a knowledge-practice gap in breakfast consumption. Parents and other stakeholders should encourage nutritious breakfast consumption among adolescents in secondary school setting to meet their daily dietary allowance.

Keywords: Breakfast consumption, Public and Private schools, Adolescents, Nutritional status.

Word count: 458

CERTIFICATION

I certify that this work was carried out by ABIOLA, Aishat Ajoke in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Oyo State, Nigeria.

Supervisor

PROFESSOR O. OLADEPO

B.Sc., MPH, Ph.D (Ibadan), FRSPH(UK)

Department of Health Promotion and Education
Faculty of Public Health, College of Medicine
University of Ibadan, Ibadan, Nigeria

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LIST OF ABBREVIATIONS

BDA:	British Dietetic Association
BMI:	Body Mass Index
EAT:	Eating Among Teens
FFA:	Free Fatty Acid
IBNLG:	Ibadan-North Local Government
IEC:	Information, Education and Communication
LGA:	Local Government Area
NHANES:	National Health and Nutrition Examination Survey
NPC:	National Population Census
RTEC:	Ready-to-eat Cereal
SBP:	School breakfast programme
SPSS:	Statistical Package for Social Sciences
SSS:	Senior secondary school
WHO:	World Health Organization

OPERATIONAL DEFINITION OF TERMS

Breakfast: The first meal of the day, usually eaten before 10.am in the morning.

Breakfast Consumption pattern: Attitudinal decision towards breakfast, whether to eat or skip breakfast.

Breakfast skipping: Attitudinal decision towards not eating of breakfast.

Adolescents: Defined as any person between the ages of 10-19 years.

In-school Adolescent: Any student in senior secondary school

Nutritional status: Using Body Mass Index (BMI) to measure the degree of nutrient among in-school adolescent.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Breakfast is defined as the first meal that is taken after rising from a nights sleep, most often eaten in the morning before undertaking the days work, typically no later than 10am (Giovannini, Verduci, Scaglioni, Salvatici, Bonza, Riva and Agostoni, 2008) which keeps an individual alert and keep active to work for several hours in a day before lunch break (Arora, Nazar, Gupta, Perry, Reddy and Stigler, 2012; Mathys, Henauw, Bellemans, Maeyer and Backer, 2007 and Reeves, Halsey, McMeel and Huber, 2013). It serves as part of a healthy diet which provides approximately 20% of daily energy requirements (British Dietetic Association, 2010) and has consistently been linked with positive health benefits. Breakfast meal is known to provide key macronutrients and micronutrients in the diet, including B-vitamins, iron and calcium (Ruxton and Kirk, 1997; Chitra and Reddy, 2007; Williams, 2007). This has been shown in the observation that the prevalence of inadequate nutrient intake is lower among adolescents who consume breakfast with those who skip breakfast (Hallstrom, Labayen, Ruiz, Patterson, Vereecken, and Breidenassel, 2013; Hoyland, McWilliams, Duff and Walton, 2012; Ruxton, Kirk, Belton and Holmes, 1993 and Nicklas, Bao, Webber and Berenson, 1993).

Breakfast consumption has been associated with adolescents' mental and physical health (O'Sullivan, Robinson, Kendall, Miller, Jacoby, Silburn and Oddy, 2003; Pearson, Biddle, and Gorely, 2009), increase ability to concentrate at school due to its effect on blood glucose level thereby enhancing cognition and learning (Bellisle, 2004; Huda and Ruzita, 2011; Obbagy, Patricia and Eve, 2011), reduced risk of developing chronic diseases (World Health Organization, 2003), healthy body mass index and reduced likelihood of obesity development (De la Hunty and Ashwell, 2007; Szajewska and Ruszczynski, 2010), it may also be protective of weight gain over time (Ask, Hernes, Aarek, Johannessen, Haugen, 2006; Albertson, Franko, Thompson, Eldridge, Holschuh, Affenito, Bauserman and Striegel-Moore, 2007).

Skipping of breakfast tends to increase with age after childhood and appears to be most frequent in adolescents (Barton, Eldridge, Thompson, Affenito, Striegel-Moore, Franko, Albertson and Crockett, 2005).

Skipping breakfast is becoming prominent particularly among adolescent girls in secondary schools ((Arora et al., 2012 and Hoyland et al., 2012). Several studies attributed this phenomenon to lower socio economic status, food deprivation, long use of cell-phones and other electronic devices especially at night (Burghardt and Devaney, 1995; Hoyland et al.,2012; Pereira, Erickson, McKee, Schrankler, Raatz, Lytle and Pellegrini, 2011 and Utter, Scragg, Mhurchu and Schaaf, 2007). Adolescents and children are still dependents and they need adequate attention and care in order for them to be able to develop meals and food habits that are healthy and will promote good nutritional status (Lazzeri, Pammolli, Azzolini, Meoni, Simi, Wet and Giacchi, 2013; Nanney, Olaleye, Wang, Motyka and Klund-Schubert, 2011; Story, Pearce, Ashfield-Watt, Wood, Baines and Nelson, 2011 and Wate, Snowdon, Millar, Nichols, Mavoa, Goundar and Swinburn, 2013). People who skip breakfast are more likely to have difficulty concentrating by mid-morning and to experience space in intellectual performance (Keski-Rahkonen, Kaprio, Rissanen, Virkkunen and Rose, 2003 and Nicklas et al., 2004) as well as low physical activity levels (Sandercock, Voss and Dye, 2010). The practice of skipping breakfast may aid the consumption of snacks that are high in fat, salt and sugar (Resnicow, 1991; Berge, Wall, Larson, Loth, and Neumark-Sztainer, 2013; Feeley and Norris, 2014 and Rodrigues, Pereira, Cunha,Sichieri, Ferreire, Vilela and Goncalves-Silva, 2012) and predisposes them to obesity. Skipping breakfast and Unhealthy food consumption may lead to micro nutrient deficiency and poor nutritional status (Acham, Kikafunda, Malde, Oldewage-Theron and Egal, 2012; Hallstrom et al; 2013 and Pereira et al., 2011). Breakfast skipping in adolescents has also been linked with other unhealthy behaviours, such as frequent alcohol intake, infrequent exercise, smoking (Keski-Rahkonen, Kaprio, Rissanen, Virkkunen, and Rose, 2003).

Majority of the adolescents skip breakfast due to different reasons such as not liking the food served at breakfast, not being hungry in the morning, being on a diet to lose weight, insufficient time to eat, insufficient time to cook, lack of perceived parental emphasis on breakfast, lack of time, poverty, individual choice, not feeling good and loss of appetite (Rampersaud, Pereira, Girard, Adams and Metzl, 2005). Also, unlike children in primary schools, it is believed that most parents of in-school adolescents have lesser control over what they eat. This is because at this stage, less attention is paid to them as it is believed they can take care of themselves. What majority of them eat is largely determined by peer influence, school environment including what is available to them in the school premises or what is provided by the school canteen.

The main problem however arises when the nutritive value of the food, the hygienic condition under which it has been prepared and the portion size of food being taken are compromised which is not certain and unclear among adolescents in our setting. Malnutrition is therefore, a known major contributor to the total global disease burden and the possibility of these adolescents becoming malnourished is very high (Timlin and Pereira, 2008). The students therefore, needs to be educated and reinforced on healthy eating behaviour, healthy choice of food (Hu, Manson, Stampfer, Colditz, Liu, Solomon and Willett, 2001; Sobngwi, Mbanya, Unwin, Kengne, Fezeu, Minkoulou, Aspray and Alberti, 2002; Key, Schatzkin, Willett, Allen, Spencer and Travis, 2004; Lakka and Bouchard, 2005; Lindstrom, Peltonen and Tuomilehto, 2005) and importance of adequate nutrients intake. Though, the association between breakfast pattern and Nutritional status among University students are widely studied, few or no research has been conducted among in-school adolescents in Nigeria.

Therefore, this study aim to investigate the breakfast consumption pattern and nutritional status among in-school secondary school adolescents Ibadan North Local Government Area, Oyo state.

1.2 Statement of Problem

Breakfast consumption during adolescence is very important for physical growth, psychosocial development, cognitive performance, and prevention of diet-related chronic diseases. Research on breakfast consumption among adolescents has solely been focused on high income countries rather than the patterns of breakfast consumption, its perceived health benefits and nutritional status among in-school adolescent in Low income countries like Nigeria. Irrespective of large number of literature linking breakfast consumption with a generally healthy lifestyle (Ruxton and Kirk, 1997; De la Hunty and Ashwell, 2007), limited information exists that directly relates breakfast consumption to measures of nutritional status and healthy lifestyles among adolescents in Low income countries.

High levels of meal skipping particularly breakfast skipping, has been reported among adolescents worldwide (O'Dea and Caputi, 2001 and Samuelson, 2000). Data from the National Health and Nutrition Examination Survey (NHANES) 2001-2002 reported that 13-14% of children aged 6 to 11 and 30-31% aged 12-19 are skipping breakfast on any given day (U.S Department of Agriculture).

Skipping of breakfast tends to increase with age after childhood and appears to be most frequent in adolescents (Barton et al., 2005). During the adolescents stage, it has been observed that most parents of in-school adolescents have lesser control over what they eat. This is because at this stage, less attention is paid to them as it is believed they can take care of themselves. What majority of them eat is largely determined by peer influence, school environment including what is available to them in the school premises or what is provided by the school canteen and lack of knowledge of healthy food choices may negatively affect nutritional status and eating habits (Gan, Mohd, Zalilah and Hazizi, 2011). The main problem however arises when the nutritive value of the food, the hygienic condition under which it has been prepared and the portion size of food being taken are compromised which is not certain and unclear among adolescents in our setting. Malnutrition is therefore, a known major contributor to the total global disease burden and the possibility of these adolescents becoming malnourished is very high (Dubois, 2005 and Matthys, 2006).

The consequences of poor nutritional status at the early stage of life can result to depression, lack of self esteem, unconsciousness, anxiety and in extreme condition a premature death among school childfren and adolescents (Acham et al., 2012; Arora et al., 2012; Bhurtun and Jeewon, 2013; Hoyland et al.,2012; Mathys et al., 2007; Pereira et al., 2011 and Utter et al., 2007)
Many research findings on adolescents in secondary schools has reported low fruits and vegetables consumption, increasing snacks and soda drinks consumption, these were attributed to food environments such as inability of parents to eat breakfast with their children and food transition that most less developed countries like Nigeria are currently experiencing (Berge et al., 2013; Feeley and Norris, 2014; Fieischhacker, Evenson, Rodriguez and Ammerman, 2011; Fulkerson, Farbakhsh, Lytle, Hearst, Dengel, Pasch and Kubik, 2011; Giskes, Van Lenthe, Avendano-Pabon and Brug, 2011; Popkin, 2011 and Rodrigues et al., 2012).

The study conducted among adolescents in public secondary schools in Kwara state showed that 23% skipped breakfast (Lateef et al., 2016), 14.1% of adolescents skipped breakfast in a study conducted by Omuemu and Oko-Oboh, (2015). Adolescents who skipped breakfast are reported to have higher daily intakes of fat, cholesterol, and energy, and lower intakes of fiber, vitamins, and minerals in comparison to breakfast eaters, thereby increasing the likelihood of gastrointestinal disease later in life (Timlin and Pereira, 2007).

Skipping breakfast has been linked with adverse effects on cognitive function (including memory), academic performance, psychosocial function, and mood in children and young people (Rampersaud et al., 2005). Reduced breakfast energy intake is associated with higher total daily energy intake (Schusdziarra, Hausmann, Wittke, Mittermeier, Kellner, Naumann, Wagenpfeil and Erdmann, 2011) and when breakfast is skipped it can be difficult to properly compensate for it later in the day.

High prevalence of Obesity and malnutrition is common among adolescents who skip breakfast compare to those who consume breakfast (Keski-Rahkonen et al., 2003; Moy, Johari, Ismail, Mahad, Tie and Wan Ismail, 2009). Research has linked the consumption of breakfast with adolescents mental and physical health (O'Sullivan, Robinson, Kendall, Miller, Jacoby, Silburn and Oddy, 2008; Pearson et al., 2009).

1.3 Justification

It is necessary to promote and encourage a healthy eating breakfast pattern in adolescents. This study aims to investigate the breakfast consumption pattern (Behaviours, Beliefs, Motivations, and Personal and Environmental Influences) and nutritional status among in-school adolescents Ibadan North Local Government Area, Oyo state. Providing information on nutrition and the eating habits of adolescents is important in order to identify risky and unhealthy behaviour in this age group and advocate to parents and care givers to ensure the provision of breakfast for their school adolescents.

Moreover such information will guide educational ministries to develop new policy frame work or adjust the existing framework to meet the current food and health situations so as to bring about positive changes in breakfast consumption and to reduce the occurrence and development of chronic Non communicable diseases later in life. Conducting this study will also provide answers to the study questions below.

1.4. Research Questions

a. What is the level of respondents knowledge on breakfast consumption and its perceived health benefits?
b. What is the perception of respondents on breakfast consumption and its health benefits?
c. What are the breakfast consumption patterns among the respondents?
d. What are the factors influencing breakfast consumption pattern among the respondents?
e. What is the nutritional status using Body Mass Index (BMI) among the respondents?

1.5. Broad Objective

To investigate the breakfast consumption pattern and nutritional status among in-school adolescents in Ibadan North Local Government Area, Oyo state.

1.6. Specific Objectives

a. To assess the level of knowledge of the respondents on breakfast consumption and its perceived health benefits.
b. To explore the perception of respondents on breakfast consumption and its health benefits
c. To determine breakfast consumption pattern among the respondents.
d. To identify factors influencing breakfast consumption pattern among the respondents.
e. To determine the nutritional status using Body Mass Index (BMI) among the respondents.

1.7. Research Hypotheses

a. There is no significant relationship between breakfast consumption pattern and nutritional status among the respondent.
b. There is no significant relationship between the level of knowledge of the perceived health benefits of breakfast consumption and pattern of breakfast consumption among respondents.
c. There is no significant relationship between breakfast consumption pattern and family structure of respondents.
d. There is no significant relationship between breakfast consumption pattern and gender of respondents.

CHAPTER TWO

LITERATURE REVIEW

2.1. Definition of breakfast consumption

Breakfast is defined as the first meal of the day, eaten before or at the start of daily activities, within 2 hours of waking, typically no later than 10am (Giovannini et al., 2008). Breakfast consumption has been shown to be an important indicator of a healthy lifestyle (Rampersaud et al., 2005). It is widely recommended as part of a healthy diet, providing approximately 20% of daily energy requirements (British Dietetic Association, 2010) and has consistently been associated with positive health benefits. The breakfast meal is known to provide key macronutrients and micronutrients in the diet, including B-vitamins, iron and calcium (Ruxton and Kirk, 1997; Chitra and Reddy, 2007; Williams, 2007).

2.2. Knowledge of Breakfast Consumption and its Perceived Health Benefits

Breakfast is the most important meal of the day as it is known to provide energy and nutrient intake (Affenito et al., 2005; Matthys et al., 2007). Breakfast consumption has been associated with a multitude of health-related benefits, including improved nutrient intake (Gibson and Gunn, 2010), increased moderate-to-vigorous physical activity (Corder, van Sluijs, Ridgway, Steele, Prynne, Stephen, Bamber, Dunn, Goodyer and Ekelund, 2014), and improved mood (Defeyter and Russo, 2013). Consumption of breakfast is a dietary pattern which contributes positive benefits in nutrition and cognitive function (Albertson, Douglas, Debra and Norton, 2011). It is correlated with better food choice and consequently better intake of essential nutrients (Sugiyama, Okuda, Sasaki, Kunitsugu and Hobara, 2012). The consumption of a healthy breakfast is important to health (Timlin and Pereira, 2007). Specifically, eating breakfast is associated with improved nutrient intake and lower body mass index (Sjoberg, Hallberg, Hoglund and Hulthen, 2003; Affenito et al., 2005; Barton et al., 2005; Croezen, Visscher, Ter Bogt, Veling and Haveman-Nies, 2007; Deshmukh-Taskar et al., 2010). Regular breakfast consumption takes advantage of physiologic mechanisms that are hypothesised to increase the satiety and reduce the risk of childhood obesity (Timlin, Pereira, Story and Neumark-Sztainer, 2008).

Breakfast is widely recommended as part of a healthy diet, providing approximately 20% of daily energy requirements (British Dietetic Association, 2010) and has been consistently associated with positive health benefits. The breakfast meal is known to provide key macronutrients and micronutrients in the diet, including B-vitamins, iron and calcium (Ruxton and Kirk, 1997; Chitra and Reddy, 2007; Williams, 2007). This is reflected in the observation that breakfast skippers tend to have lower nutrient intakes compared to habitual breakfast consumers (Rampersaud et al., 2005; Matthys et al., 2007; Williams, 2007). Indeed, evidence indicates that breakfast skippers fail to compensate for micronutrients missed at breakfast during meal times later in the day (Gibson, 2003).

A wealth of data indicate that regular breakfast consumption has also been associated with a healthier body mass index and reduced likelihood of obesity development in adults and children alike (de la Hunty and Ashwell, 2007; Szajewska and Ruszczynski, 2010); it may also be protective of weight gain over time (Ask et al., 2006; Albertson et al., 2007). By eating breakfast, students get more of important nutrients, vitamins and minerals such as calcium, dietary fiber, folate and protein (Affenito et al., 2005; Wilson, Parnell, Wohlers and Shirley, 2006). Breakfast consumption is an important component of nutrition, and as part of a healthy diet and lifestyle, is thought to impact positively on children's health and well-being (Rampersaud et al., 2005). Studies have shown that children who eat breakfast on a regular basis are less likely to be overweight (Timlin, Pereira, Story, and Neumark-Sztainer, 2008; Dubois et al., 2009). Evidence also suggests that breakfast consumption can enhance cognitive function and academic performance, as well as improve mood (Wesnes et al., 2003; Widenhorn-Muller et al., 2008; Hoyland, Dye and Lawton, 2009). Regular breakfast consumption is also associated with reduced stress, depression, and emotional distress (Smith, 2002). Amongst young people, eating breakfast correlates with improved school attendance, whilst skipping breakfast interferes with memory and attention (Hoyland, Dye and Lawton, 2009). Conversely, those who eat breakfast on a daily basis may benefit further in terms of obesity and disease prevention through e.g., nutrient and fiber-rich meals such as whole grain cereals (Siega-Riz, Popkin and Carson, 2000; Pereira, Jacobs, Pins, Marquart and Keenan, 2001; Pereira, Ebbeling, Pawlak, Leidig and Ludwig, 2002; Pereira, Jacobs, Pins, Raatz, Gross, Slavin and Seaquist, 2002; Rampersaud et al. 2005; Timlin and Pereira, 2007).

In addition, for university students, breakfast consumption is associated with a range of positive outcomes, including academic performance, nutrient intake, fitness, and appropriate body weight (Sandercock, Voss and Dye, 2010; Hoyland, Dye and Lawton, 2009; Moore et al., 2007).

2.3. Prevalence and practice of breakfast consumption among adolescents

Breakfast skipping is relatively common among adolescents and adults in western countries. For example, food diary data from a sample of Dutch 4–15 year olds revealed that 5% of primary school children and 13% of secondary school children skipped breakfast before school (Brugman, Meulmeester, Spee-van der Wekke, and Verloove-Vanhorick, 1998). A higher incidence of breakfast skipping was observed in the recent pan-European Healthy Lifestyle in Europe by Nutrition in Adolescence study (Hallstrom, See Vereecken, Ruiz, Patterson, Gilbert, Catasta, Diaz, Gomez-Martinez, Gonzalez Gross, Gottrand, Hegyi, Lehoux, Mouratidou, Widham, Astrom, Moreno and Sjostrom, 2011), which reported that 46% of the sample of 3528 adolescents from ten countries agreed either slightly, moderately or strongly with the statement 'I often skip breakfast'. People who skip breakfast are more likely to have difficulty concentrating by mid-morning and to experience space in intellectual performance (Keski-Rahkonen et al., 2003 and Nicklas et al., 2004) as well as low physical activity levels (Sandercock et al., 2010).

A high incidence of breakfast skipping was also reported in the US National Health and Nutrition Examination Survey (NHANES 1999– 2006), where 20% of children and 32% of adolescents reported skipping breakfast (Deshmukh-Taskar, Nicklas, O'Neil, Keast, Radcliffe and Cho, 2010). Previous studies have found that breakfast consumption has declined in all age groups over the past 25 years, particularly amongst older females and female adolescents aged from 15-18 years (Australian Bureau of Statistics, 1995; Keski-Rahkonen et al., 2003). A more recent survey of Welsh primary school children indicated that 15% of the sample of 1672 9–11 year olds agreed or strongly agreed with the statement 'Most days, I don't eat breakfast' (Moore et al., 2009). In a further study, 7.2% of a large sample of 10–16 year old school children in the UK reported never eating breakfast (Sandercock et al., 2010).

The study conducted among Adolescents in public secondary schools in Kwara state showed that 23% skipped breakfast (Lateef et al., 2016), 14.1% of adolescents skipped breakfast in a study conducted by Omuemu and Oko-Oboh, (2015), 31.5% of adolescents skipped breakfast in a study conducted by Priya, Theresa, Carol, Debra, John and Susan, (2010), the prevalence of breakfast skipping among children and adolescents in the Netherlands was 19.1% (Lieke, Raaijmakers, Kathelijne, Bessems, Stef, Kremers and Patricia van Assema, 2009), similar study conducted in Croatia by Irena and Zvonimir (2008) showed that 1.7% skipped breakfast meal. 43.6% prevalence of breakfast skippers among adolescents aged 12–15 years in Rotterdam schools (Dejong, van Lenthe and van der Horst, 2009), while it was 14% among adolescents in UK school children (Hoyland et al., 2012).

2.4. Health benefits of breakfast consumption

Breakfast is the most important meal of the day that provides people with energy to begin their day. Childhood and adolescence is a crucial period that requires adequate nutrition. As an individual sleeps, the body changes from the fed to the fasted state which causes an elevated level of serum glucagon concentrations which yield the liver in the production of glucose by converting glycogen to glucose and it occurs until one fourth of the glycogen stores are depleted. When food is consumed, there is maintenance of fuel homeostasis (Hill, 1995).

Breakfast also provides adequate nutrient intake which helps the growth and development demands of children and adolescents (Hill, 1995; Rampersaud et al., 2005). For instance, the daily intake of a nutrient such as calcium is higher for those who consume breakfast (Rampersaud et al., 2005) compare to those who do not.

Calcium is very important for children and adolescents since it is the period when bone calcium accumulation is at its highest.

It has been observed that the population of people who skip breakfast are more than people who do not. For instance, In a recent study conducted on 612 fourth grade students, a significant amount (27%) reported they skipped breakfast three or more times per week (Gross et al., 2004). In another study, one in five adolescents were found to skip breakfast (Videon & Manning, 2003).

Therefore, breakfast plays major role in the following among children and adolescents.

2.4.1. Effects of Breakfast on Cognition and Academic Performance

Effects of Breakfast on Cognition

Breakfast consumption has a positive impact on cognitive performance in children and adolescents. Breakfast intake alleviates hunger, thereby making the child to be alert. It has also been reported that breakfast benefits several aspects of memory function (Gross, Bronner, Welch, Dewberry-Moore and Paige, 2004; Rampersaud et al., 2005).

In a study conducted by Rampersaud et al., 2005, it was observed that out of 569 students from the ages of 11 to 13 years that breakfast consumed 30 minutes before they were tested improved their recall memory function, contributed to an increase in school attendance and a decrease in tardiness rates Unlike satiated children, who did not take breakfast experience things like dizziness, irritability, colds, and ear infections, and are less able to concentrate (Hill, 1995). Also, a study of U.S. elementary school children compared the effects of instant oatmeal versus ready-to-eat-cereal breakfasts. Among 9 to 11 year olds, boys and girls showed enhanced spatial memory and girls showed improved short-term memory after consuming oatmeal. Among 6 to 8 year olds, boys and girls showed better spatial memory and better auditory attention and girls exhibited better short-term memory after consuming oatmeal (Mahoney, Taylor, Kanarek and Samuel, 2005). After 6 to 11 year old English school children consumed a low glycemic index breakfast cereal, they showed significantly less decline in performance on attention and memory tests throughout the morning compared to a high glycemic index cereal (Ingwersen, Defeyter, Kennedy, Wesnes and Scholey, 2007).

According to Meyers, Sampson,Weitzman, Rogers and Kayne in 1989, It has been suggested that skipping breakfast may have deleterious effects upon various aspects of cognitive functioning. Breakfast skipping can interfere with cognition and learning among children (Rampersaud et al., 2005; Pearson et al., 2009). In some experimental studies, breakfast consumption is positively associated with several aspects of short-term memory function for various age groups and types of tests. Specifically, benefits have been reported for recall (Vaisman, Voet, Akivis and Vakil, 1996), episodic memory (Wesnes et al., 2003), and short-term memory (Pollitt, Leibel and Greenfield, 1981; Simeon and Grantham-McGregor, 1989; Michaud, Musse, Nicolas and Mejean, 1991).

However, several studies report no effect from breakfast on short-term memory (Dickie and Bender, 1982; Simeon and Grantham-McGregor, 1989; Cromer, Tarnowski, Stein, Harton and Thornton, 1990; Lopez, de Andraca, Perales, Heresi, Castillo and Colombo, 1993; Chandler, Walker, Connolly and Grantham-McGregor, 1995; Jacoby, Cueto and Pollitt, 1996). Overall, data are less supportive for the effects of eating breakfast on other cognitive variables such as attention, problem solving, and reading or listening comprehension (Rampersaud et al., 2005). Differences in nutritional status may influence breakfast's effect on cognition in the short term. For example, short-term intervention trials conducted in rural populations outside the U.S. indicate that children at nutritional risk seem to benefit most from eating breakfast (Simeon and Grantham-McGregor, 1989; Chandler et al., 1995; Cueto, Jacoby and Pollitt, 1998), but in longer-term studies, do not gain additional benefits on achievement test scores compared to adequately nourished children (Powell, Grantham-McGregor and Elston, 1983; Powell, Walker, Chang and Grantham-McGregor SM, 1998).

Breakfast and Academic Performance

Breakfast consumption has been shown to beneficial effect on academic and achievement test scores, grades, school attendance and tardiness rates (Meyers et al., 1989; Murphy, Pagano, Nachmani, Sperling, Kane and Kleinman, 1998; Kleinman, Hall, Green, Korzec- Ramirez, Patton, Pagano and Murphy, 2002; Boey, Omar and Arul Phillips, 2003; Kim, Frongillo, Han, Oh, Kim, Jang, Won, Lee and Kim, 2003). Several improvements were observed in students who participated in a school breakfast program. For example, Minnesota elementary school students participating in a Universal School Breakfast Pilot improved attendance, increased math and reading scores, and reported better concentration and increased alertness and energy (Wahlstrom and Begalle, 1999). Hunger in the morning can affect performance at school mainly due to lack of concentration (Nicklas, 2007).

Public school students in Philadelphia and Baltimore who increased their participation in the school breakfast program had significantly greater increases in math grades, significantly greater decreases in rates of school absence and tardiness, and significantly lower ratings of psychosocial problems than children whose participation remained the same or decreased (Murphy et al., 1998).

Six months after the start of free school breakfast programs, inner-city students who improved their nutritional status also showed significantly greater improvements in attendance and school breakfast participation, decreases in hunger, and improvements in math grades and behaviour (Kleinman et al., 2002). Two experimental studies on breakfast skipping (fasting) in well-nourished U.S. school children show mixed results. In one study, skipping breakfast adversely affected students' ability to accurately solve problems, but helped with immediate recall in short-term memory (Pollitt, Leibel and Greenfield, 1981). In the second study, skipping breakfast adversely affected the students' late morning problem-solving performance (Pollitt, Lewis, Garza, Shulman, 1982-1983). An European study of 195 10-year old school children suggested that the amount of calories consumed at breakfast may affect school performance (Wyon, Abrahamsson, Jartelius and Fletcher, 1997).When children consumed more than 20 percent of their recommended daily calorie intake at breakfast, voluntary physical endurance and performance on a creativity test were significantly better than when they consumed less than 10 percent of recommended calories at breakfast.

In addition, two randomized controlled trials show that school breakfast has a positive effect on achievement test scores and school attendance rates in undernourished rural Jamaican children (Powell et al., 1983; Powell et al., 1998). School attendance rates were improved in a trial of Peruvian children randomized to receive a school breakfast or no school breakfast for a period of three months (Jacoby, Cueto and Pollitt, 1996).

2.4.2. Effects of Breakfast on Body Weight

The relationship between breakfast and body weight is explained by the nutritional content of the meal and physiologic factors. For instance, fiber is a nutrient that is often consumed at breakfast and may help improve glucose and insulin parameters that affect satiety, which in turn may help in controlling food cravings and snacking throughout the day (Timlin and Pereira, 2008). Dairy, which is often consumed at breakfast, is an excellent source of calcium. Both calcium and dairy intakes alone have been linked to lower Body Mass Index related to their role on body fat regulation (Barton et al., 2005; Gonzalez, 2006 and Lorenzen, 2007).

During adolescence body image becomes a concern. Especially females, they believe their body weight is too high which can lead them to skip breakfast as a means of losing weight (Rampersaud et al., 2005; Videon and Manning, 2003).

There is an increasing evidence that skipping breakfast is associated with excess weight gain and other adverse health outcomes (Timlin and Pereira, 2007). A wealth of data indicate that regular breakfast consumption has also been associated with a healthier body mass index and reduced likelihood of obesity development in adults and children alike (De la Hunty and Ashwell, 2007; Szajewska and Ruszczynski, 2010), it may also be protective of weight gain over time (Ask et al., 2006; Albertson et al., 2007). Children and adolescents who eat breakfast (including school breakfast) are significantly less likely to be overweight, while skipping breakfast is associated with a higher risk of obesity (Jones, Jahns, Laraia and Haughton, 2003; Millimet, Tchernis and Husain, 2009).

Many people think that skipping breakfast will help them lose weight but studies consistently show that those who eat breakfast are less likely to be overweight or obese (Siega-Riz, Popkin and Carson, 1998; Bertrais, Luque, Preziosi, Fieux, De Flot, Galan and Hercberg, 2000; Sjoberg, Hallberg, Hoglund and Hulthen, 2003; De la Hunty and Ashwell, 2007), whereas those who eat breakfast tend to be leaner and more likely to maintain weight over time (Gibson and O'Sullivan, 1995). Eating breakfast may help prevent weight gain, according to findings from the Health Professionals Follow-up Study (Van der Heijden, Hu, Rimm and van Dam, 2007). This prospective study of 20,064 men ages 46 to 81 years found that breakfast consumption was inversely associated with the risk of a 5kilogram (11-pound) weight gain. The association was more pronounced in men with a baseline BMI of 25 or lower. Increased snacking, sedentary lifestyle and obesity have been found to be common among those who skip breakfast than the breakfast eaters (Keski-Rahkonen et al., 2003; Moy et al., 2009).

Data from America show that children and adults who eat breakfast have healthier weights than those who skip breakfast (Wolfe, Campbell, Frongillo, Haas, and Melnik, 1994; Haines, Guilkey and Popkin 1996). Those who skip breakfast on a regular basis are nearly five times more likely to be obese (Ma, Bertone, Stanek, Reed, Hebert, Cohen, Merriam and Ockene, 2003). A recent summary of nine studies involving both adults and children found that people who eat breakfast cereals regularly tend to have a lower body mass index (BMI) and are less likely to be overweight than those who do not eat breakfast cereals frequently (De la Hunty and Ashwell, 2007). Eating breakfast each day may be a smart strategy for maintaining weight loss.

Findings from the National Weight Control Registry show that 78 percent of people who have successfully maintained a weight loss of 30 pounds or more for at least one year eat breakfast daily and almost 90 percent eat breakfast on four or more days each week. Only 4 percent report never eating breakfast (Wyatt, Grunwald, Mosca, Klem, Wing and Hill, 2002). A recent review of studies on U.S. adults found that eating breakfast may aid in weight control and related disease risks, but cautioned that more research is still needed in larger, randomized trials (Timlin and Pereira, 2007).

In a nationally representative sample of adolescents from the NHANES III, 1988-1994 database, eating breakfast every day or some days was significantly associated with a risk of overweight in those with obese parent(s) and was the strongest protective factor in this group (Fiore, Travis, Whalen, Auinger and Ryan, 2006). The three-year Growing Up Today Study (GUTS) examined skipping breakfast and weight change in more than 14,000 adolescents. At baseline, children who never ate breakfast were heavier and more likely to be overweight than children who ate breakfast more consistently. However, over the first year, overweight children who skipped breakfast had smaller BMI increases than overweight children who ate breakfast daily. Normal weight children who skipped breakfast tended to have greater BMI increases compared to breakfast eaters, although this finding was not statistically significant (Berkey et al., 2003). Numerous studies have reported a link between breakfast skipping and obesity in children and adolescents.

The National Weight Control Registry follows adults who have lost significant amounts of weight, 78% of successful dieters in the Registry reported eating breakfast everyday (Wyatt et al., 2002). Findings from New Zealand's 2002 National Children's Nutrition Survey showed that, among a nationally representative sample of 3,275 children ages five to 14 years, skipping breakfast was associated with a higher BMI (Utter et al., 2007). The five-year prospective Project EAT (Eating Among Teens) study examined the association between breakfast frequency and five-year body weight change in 2,216 adolescents. Cross-sectional analyses from an initial survey and follow-up survey five years later revealed inverse associations between breakfast frequency and BMI that were largely independent of confounding and dietary factors.

A prospective analysis showed that frequency of breakfast was inversely associated with BMI in a dose-response manner. Adjustment for weight-related variables (concerns, behaviours, and pressures) seemed to partly explain this finding (Timlin and Pereira, 2008). Emerging research also suggests that whole oat and whole oat-based product consumption is consistent with dietary patterns that may favorably alter risk for elevated blood pressure, type 2 diabetes, and weight gain (Andon and Anderson, 2008).

2.4.3. Effects of Breakfast on health and well-being

Breakfast has been related to long-term health outcomes (Belloc and Breslow, 1972). It helps in better quality of life, risk reduction of chronic diseases, and even decreased risk of death (Kaplan et.al., 1987). For instance, in a study conducted by (Resnicow, 1991), focused on school children aged 9 to 19 years, found that children who skip breakfast tend to have significantly higher levels of plasma total cholesterol levels compared with people who consume breakfast. Thereby, putting them at higher risk for chronic illnesses such as cardiovascular disease.

Breakfast and Cardiovascular Health

According to Martin, 2006, adequate nutrition is important for a variety of reasons including optimal cardiovascular function. Breakfast consumption may help promote cardiovascular health. Studies have shown that adolescents and children who skip breakfast had higher blood cholesterol levels than breakfast consumers, especially among those who ate cereal for breakfast (Stanton and Keast, 1989; Resnicow, 1991).

Breakfast consumption is also associated with heart protective eating patterns such as lower fat intake in adults and higher fiber intake in adults, children, and adolescents (Ruxton and Kirk, 1997). Breakfast skipping may be linked to the up-regulation of appetite later in the day which can result in not only weight gain but deleterious changes in the risk factors for cardiovascular diseases and diabetes (Giovannini, Agnosti, and Dhamir, 2010).

Overweight in childhood and adolescence is associated with conditions such as elevated blood pressure levels (Labarthe, Mueller and Eissa, 1991), type 2 diabetes mellitus (Vivian, 2006), and reduced insulin sensitivity (Ripamonti, De Medici, Guzzaloni, Moreni, Ardizzi and Morabito, 1991), that are associated with a high risk for the development of atherosclerosis and cardiovascular complications in adulthood (Schiel, Beltschikow, Kramer and Stein, 2006).

Recent research showed that high fiber oatmeal/oat cereal consumption favorably altered LDL cholesterol subclass in middle-aged and older men (Davy, Davy, Ho, Beske, Davrath and Melby, 2002). In addition, oat antioxidants (avenathramides) may reduce early atherogenic events (Chen, Milbury, Collins and Blumberg, 2007; Liu, Zubik, Collins, Marko and Meydani 2004; Nie, Wise, Peterson and Meydani 2006).

A study evaluating the association between breakfast cereal intake and heart failure among 21,376 participants of the Physicians' Health Study I, found that higher intake of whole grain breakfast cereals, but not refined cereals, is associated with a lower risk of heart failure (Djousse and Gaziano, 2007).

Breakfast and Healthy Digestion

Numerous studies indicate that adults, adolescents, and children who regularly consume breakfast have a higher daily intake of fiber (Rampersaud et al., 2005; Timlin and Pereira, 2007). It is known that dietary fiber found in many breakfast cereals and other grain products, fruits, and vegetables helps maintain a healthy digestive system by promoting regularity and helping to decrease the incidence of constipation. Although inconclusive, some research suggests that fiber helps reduce the risk of colon cancer (Peters, Sinha, Chatterjee, Subar, Ziegler, Kulldorff, Bresalier, Weissfeld, Flood, Schatzkin and Hayes, 2003; Bingham, Day, Luben, Ferrari, Slimani, Norat, Clavel-Chapelon, Kesse, Nieters, Boeing, Tjonneland, Overvad, Martinez, Dorronsoro, Gonzalez, Key, Trichopoulou, Naska, Vineis, Tumino, Krogh, Bueno de Mesquita, Peeters, Berglund, Hallmans, Lund, Skeie, Kaaks and Riboli, 2003). Furthermore, slow absorption and digestion of starch at one meal (i.e. breakfast) may improve carbohydrate tolerance at the following meal (Nestler, Barlascini, Clore and Blackard, 1988; Wolever, Jenkins, Ocana, Rao and Collier, 1988; Liljeberg, Akerberg and Bjorck, 1999; Pereira et al., 2002; Clark, Gardiner, McBurney, Anderson, Weatherspoon, Henry and Hord, 2006; Jenkins, Jenkins, Wolever, Vuksan, Rao, Thompson and Josse, 1994).

Breakfast and Bone Health

Several studies indicate that adults, adolescents, and children who consume breakfast regularly have higher daily intake of calcium and other important nutrients (Rampersaudet al., 2005; Affenito et al., 2005; Timlin and Pereira, 2007). A large body of research supports the role of high calcium intake in promoting bone health in adults and children (Heaney, 2000; Wosje and Specker, 2000; Lau, Lynn, Chan, Lau and Woo, 2004; Du, Zhu, Trube, Zhang, Ma, Hu, Fraser and Greenfield, 2004; Cheng, Lyytikainen, Kroger, Lamberg-Allardt, Alen, Koistinen, Wang, Suuriniemi, Suominen, Mahonen, Nicholson, Ivaska, Korpela, Ohlsson, Vaananen and Tylavsky, 2005).

Studies have linked high soft drink consumption rate to poor intake of calcium, vitamin C and increased risk of bone fractures (Harnack, Stang and Story, 1999). Breakfast eaters who ate ready-to-eat cereal with milk consumed seven times more calcium at breakfast compared to those who ate ready-to-eat cereal without milk (Song, Chun, Kerver, Cho, Chung and Chung, 2006). In one review that included 52 investigator controlled calcium intervention studies, all but two of these studies showed that high calcium intakes were associated with positive outcomes such as better bone balance, greater bone gain during growth, reduced bone loss in the elderly, or reduced fracture risk (Heaney, 2000).

2.4.4. Breakfast, Insulin Levels and metabolic syndrome

Breakfast and Insulin Levels

Breakfast is the most important among meals because it is the time when prolonged fasting ceases. Longer fasting times are associated with higher ghrelin concentrations and lower insulin concentrations, which could induce hunger and eating (Boyle, Shah and Cryer, 1989; Cummings, Purnell, Frayo, Schmidova, Wisse and Weigle, 2001). Emerging evidence suggests that eating breakfast may positively impact circulating insulin levels. A small randomized crossover trial in 10 healthy women found that those who skipped breakfast had higher fasting insulin levels, as well as higher total and LDL cholesterol, after a test meal compared to those who ate a breakfast that included a whole grain ready-to-eat cereal and lower fat milk (Farshchi, Taylor and Macdonald, 2005).

In a large sample of 13–16 year old Dutch adolescents, breakfast skipping was more strongly associated with being overweight than physical inactivity (Croezen, Visscher, Ter Bogt, Veling, Haveman-Nies, 2007). Further, after controlling for age, gender, life- style factors, and socio-demographics, individuals who skipped breakfast throughout childhood and adulthood were found to have higher fasting insulin levels, higher cholesterol, and greater waist circumferences than those who ate breakfast (Smith, Gall, McNaughton, Blizzard, Dwyer and Venn, 2010).

Some observational and clinical studies (Pereira et al., 2002; Liese, Roach, Sparks, Marquart, D'Agostino and Mayer-Davis, 2003; Steffen, Jacobs, Murtaugh, Moran, Steinberger, Hong and Sinaiko, 2003; McKeown, 2004; McKeown, Meigs, Liu, Saltzman, Wilson and Jacques, 2004), but not all (Juntunen, Laaksonen, Poutanen, Niskanen and Mykkanen, 2003; Anderson, Tengblad, Karlstrom, Kamal-Eldin, Landberg, Basu, Aman and Vessby, 2007), show that increased whole grain and fiber intake increase insulin sensitivity.

Another randomized crossover trial conducted with 45 adults with type 2 diabetes found that a low glycemic load breakfast meal containing psyllium soluble fiber improved the breakfast postprandial glycemic, insulinemic, and free fatty acid (FFA) responses after breakfast, but not after lunch (Clark et al., 2006). Similarly, a recent longitudinal study of children aged 9 to 15 years at the start of the study, when followed over 24 years also found that breakfast skipping in both childhood and current adulthood life were significantly associated with higher levels of BMI, waist circumference and blood markers of insulin and low density lipoprotein cholesterol compared to those who were taking breakfast at both time points, suggesting that infrequent breakfast consumption over a long period may have detrimental effects on body weight and cardio-metabolic health (Smith et al., 2010).

Breakfast and Metabolic Syndrome

Breakfast consumption contributes to the prevention of metabolic syndrome and weight gain (Van der Heijden et al., 2007; Thompson-McCormick, Thomas, Bainivualiku, Khan and Becker, 2010; Astbury, Taylor, Macdonald, 2011). Childhood obesity has been associated with increased prevalence of early onset of type 2 diabetes mellitus and metabolic syndrome (Bokor, Frelut, Vania, Hadjiathanasiou, Anastasakou, Malecka-Tendera, Matusik and Molnar, 2008; Ehtisham, Barrett, and Shaw, 2000).

Some studies (Sonnenberg, Pencina, Kimokoti, Quatromoni, Nam, D'Agostino, Meigs, Ordovas, Cobain and Millen, 2005; Esmaillzadeh et al., 2007) but not all (Baxter, Coyne and McClintock, 2006), have shown dietary patterns that include high fruit consumption may play a role in reducing the prevalence of metabolic syndrome. A cross-sectional examination of the prevalence of metabolic syndrome in participants in the Framingham Offspring Study showed that fiber from cereals, but not fruit and vegetables, was inversely related to the prevalence of the metabolic syndrome (McKeown et al., 2004). Diets rich in whole grains may be associated with decreased risk of metabolic syndrome (Esmaillzadeh, Mirmiran and Azizi, 2005; Baxter et al., 2006; Esmaillzadeh et al., 2007).

2.4.5. Breakfast and Healthful Lifestyle Habits

Skipping breakfast among adolescents has been associated with various health-compromising behaviours and unhealthy lifestyles, such as tobacco, alcohol, and substance use, and risk-taking in general (Revicki, Sobal and DeForge, 1991; Isralowitz and Trostler, 1996; Hoglund, Samuelson and Mark 1998). Adolescents who skip breakfast may exhibit less healthful dietary behaviours, such as irregular eating patterns and an increased intake of less nutritious foods (Sjoberg et al., 2003; Keski-Rahkonen et al., 2003).

It has also been associated with other unhealthy behaviours, including smoking, infrequent exercise, and frequent alcohol intake in adolescents and their parents (Keski-Rahkonen et al., 2003), as well as low physical activity levels (Sandercock et al., 2010). Conversely, regular breakfast eating has been associated with a health-conscious lifestyle (Baumert Jr, Henderson and Thompson, 1998; Cavadini, Decarli, Grin, Narring and Michaud, 2000). Habitual breakfast skipping is also associated with various lifestyles and physical conditions, including fatigue, insomnia, lack of time for eating, smoking, infrequent exercise, alcohol drinking, full-time working, and even coronary heart disease (Tanaka, Mizuno, Fukuda, Shigihara, and Watanabe, 2008; Huang, Hu, Fan, Liao, and Tsai, 2010; Cahill, Chiuve, Mekary, Jensen, Flint, Hu and Rimm, 2013). Research shows that daily breakfast consumption has important positive associations with healthy lifestyle behaviours, while breakfast skipping has negative associations with unhealthy lifestyle behaviours (See Vereecken, 2009). Parents, as some would suggest (Matthys et al., 2007; Ruglis and Freudenberg, 2010), may play one of the most important roles of all, as they set an example for their children in healthy eating and lifestyle habits.

2.4.6. Breakfast and Satiety

Appetite, which plays an important role in the regulation of food intake, includes at least two components: satiation and satiety (Geraedts, Troost and Saris, 2010). Satiation results from a series of neural and humoral signals, mostly produced in the gastrointestinal tract in response to food stimulation. It is defined as the process that evokes meal termination. Satiety refers to the postprandial state that influences the interval between meals. Satiety or the state of being satisfactorily full may play a role in weight management. Certain breakfast foods may be more satiating than others. A study of satiety ratings among 41 healthy female Australian university students showed that oatmeal had the highest satiety value compared to other breakfast foods tested such as bread, eggs, yogurt, and croissants (Holt, Miller, Petocz and Farmakalidis, 1995).

Carbohydrates are a major source of energy in our daily diets. A hierarchy of macronutrient satiating effects has been observed for protein, carbohydrate, and fat, with protein being the most satiating and fat the least (Paddon-Jones, Westman, Mattes, Wolfe, Astrup and Westerterp-Plantenga, 2007; Potier, Darcel and Tome, 2009). However, before a recent long-term clinical trial in 811 overweight adults that compared weight loss diets with different compositions of fat, protein, and carbohydrate did not find any significant differences in satiety at 6 months and 2 years (Sacks, Bray, Carey, Smith, Ryan, Anton, McManus, Champagne, Bishop, Laranjo, Leboff, Rood, de Jonge, Greenway, Loria, Obarzanek and Williamson, 2009). Lack of adherence to the assigned intervention may partially explain the results. But more importantly, factors other than the macronutrient content may also influence the satiety process.

A randomized crossover study conducted with 15 men and women found that women who ate higher fiber, higher fat breakfast meals had greater feelings of satiety and significantly higher cholecystokinin responses than did those eating a low fat, low fiber breakfast meal (Burton-Freeman, Davis and Schneeman, 2002). Cholecystokinin is a hormone associated with satiety. An analysis of self-reported food intake among 867 men and women suggests that eating foods with low energy density (i.e., less energy per gram than other foods) in the morning is satiating and can reduce the amount eaten over the rest of the day. Findings also suggest that low energy density intake at any time of the day could reduce overall intake, and that eating late at night may add to earlier food intake to the extent that overall daily intake is greater (De Castro, 2004).

In another randomized crossover study of 30 overweight or obese American women, subjects who had eggs for breakfast reported greater feelings of satiety and consumed less energy, carbohydrate, protein, and fat for lunch compared to subjects who had bagel for breakfast. Energy intake following the egg breakfast remained lower for the entire day and the next 36 hours (Vander Wal, Marth, Khosla, Jen and Dhurandhar, 2005). Fiber is a major component of carbohydrate that is generally considered beneficial for health. Epidemiological studies show that intake of dietary fiber and whole grains is associated with a lower risk of overweight or obesity (Liu, Willett, Manson, Hu, Rosner and Colditz, 2003; Williams, Grafenauer and O'Shea, 2008). One possible mechanism for this association is prolonged satiety from lower-energy foods that are rich in dietary fiber compared with highly processed foods (Slavin, 2007; Kristensen, Jensen, Riboldi, Petronio, Bugel, Toubro, Tetens and Astrup, 2010).

2.5. Perceptions of Breakfast Consumption and its health benefits

According to Chapman, Melton, and Hammond, 1998; Reeves et al., 2013, perceptions of breakfast may influence a person's likelihood of consuming breakfast and subsequent psychological reactions to this meal. For instance, the calorie content of foods eaten at breakfast has been linked to body image satisfaction (Geshwind, Roefs, Lattimore, Fett, and Jansen, 2008) and other indicators of health and wellbeing. When it comes to breakfast consumption many individuals have their own habits, definitions and perceptions. Furthermore it has been shown that conscientiousness, possibly more so than the other factors of the five factor personality theory (Costa and McCrae, 1992) may influence health status directly via changes in health behaviours such as increased fruit and vegetable consumption and lower consumption of high fat snacks (O'Connor, O'Conner, Jones, McMillan, and Ferguson, 2009).

There is also this perception that fatigue is a common problem among students. It is believed to be highly related to dietary habits, especially skipping breakfast, and may be a cause of poor academic performance (Bruce, 1989). Chapman et al., 1998 in a study of Canadian university students reported that the majority of respondents perceived breakfast to be important in providing energy and increasing productivity in the morning.

In contrast, Unusan, Sanlier, and Danisik, 2006 compared attitudes to breakfast in Turkish children living in Turkey and Germany and found that those living in Turkey reported significantly more positive effects associated with breakfast, whereas significantly more children in Germany perceived that breakfast made them feel tired.

A study conducted by Lattimore, Walton, Bartlett, Hackett, and Stevenson in 2010, showed that women were significantly less hungry, fuller, happier and more relaxed and satisfied with their body image and weight after consuming a cereal-based breakfast compared to a muffin, despite similar calories being provided by both breakfasts. It is also perceived that adolescents who do not regularly eat breakfast are less likely to regularly eat lunch and/or dinner and are significantly more likely to consume snack foods, mostly between meals (Sjoberg et al., 2003; Utter et al., 2007). Consuming a complete and well-balanced breakfast avoids hunger feelings in the morning (Pearson et al., 2009), which can lead to nibbling snack foods, particularly those high in sugar and fat (Billon, Lluch, Gueguen, Berthier, Siest and Herbeth, 2002).

2.6. Factors influencing breakfast consumption pattern among adolescents

Majority of the adolescents begin to gain some amount of control in decisions concerning their lives especially in their choice of friends, breakfast consumption and the kind of foods they consume. Though it is their right to decide on consuming breakfast or skipping it, there are other factors that influence their choices, which can improve their choices or adversely affect them. Several factors influencing pattern of breakfast consumption have been suggested including financial constraints, habitual, unavailability of time to prepare breakfast among others (Moy, Johari, Ismail, Mahad, Tie, Wan Ismail, 2009). Recognizing factors influencing breakfast consumption is potentially important for identification of methods to promote breakfast consumption. Common factors include not liking the food served at breakfast, not wanting to eat in the morning, and a preference for sleeping over eating. Lack of time available to eat breakfast before school may be a factor in breakfast omission, since it was discovered that children were more likely to eat a substantial breakfast during holidays than on school days (Ortega, Requejo, Lopez-Sobaler, Andres, Quintas, Navia and Rivas, 1998).

In one Australian study, the factors influencing pattern of breakfast consumption were almost exclusively lack of time and not being hungry in the morning. Moreover, breakfast consumption was related to gender, not income, with males consuming more than three times as often as females (Shaw, 1998). Furthermore, individuals who regard themselves as too heavy may skip breakfast to lose weight. Consistent with the literature, Cheng, Tse, Yu, and Griffiths, (2008) reported that the most common factor influencing Hong Kong primary 6 (P6) schoolchildren pattern of breakfast consumption was not having sufficient time to eat. In addition, the lack of perceived parental emphasis on breakfast was an important factor influencing pattern of breakfast consumption. This reflects the importance of parental influence on breakfast habit among young children. For example, it has been found that parental breakfast eating is the most significant factor associated with adolescent breakfast eating (Keski-Rahkonen et al., 2003; Pearson, Biddle and Gorely, 2009), suggesting that parents may play a pivotal role in influencing breakfast choices, likely via establishing norms around breakfast eating as well as controlling the availability and preparation of food.

In China, university students often do not pay sufficient attention to breakfast, with some individuals skipping breakfast because it takes too much time (Zeng, Li, Xiong, Su and Wan, 2011). Other factors influencing pattern of breakfast consumption include lack of monetary resources (Miech, Kumanyika, Stettler, Link, Phelan and Chang, 2006), or lack of time needed for caretakers to prepare and provide breakfast for their children, poor health and nutrition knowledge among older children (Davy, Harrell, Stewart and King, 2004), lack of time or hunger to eat and prepare breakfast (Sweeney and Horishita, 2005). While North American school nutrition programs have considered poverty to be a key issue in breakfast skipping, Shaw's findings suggest that, for Australian adolescents, skipping breakfast is a matter of individual choice (Shaw, 1998). Bidgood and Cameron, (1992) found that in Canada those below the poverty line were skipping breakfast twice as often as others, but less than one percent said that they skipped due to lack of money or food. The most common factors given were, not liking to eat particular meals and lack of time. Similarly, Singleton and Rhoads, (1982) found that the most common factors influencing pattern of breakfast consumption given were no time (43%) and not being hungry (42%), less common factors included being on a diet to lose weight, not feeling good, no one to prepare food, not liking the food served, and food not being available. Thus, stated factors have generally involved personal choice rather than availability of food.

In Canada, this is not only a poverty issue. Children attend school without breakfast because families are challenged by busy, rushed schedules. In addition, children must take school bus rides very early in the morning, even if they ate breakfast they may be hungry by the time they reach school. Shaw, (1998) states that "too many young girls believe that if they can eliminate this meal, they can maintain some illusion of a perfect body shape and weight". Common factors influencing pattern of breakfast consumption given by adolescents are lack of time, lack of hunger, and dieting to lose weight (Shaw, 1998). Skipping breakfast is neither a sensible weight reduction measure, nor a "boon to the sleep deprived". Siega, Popkin, and Carson, (1998) found that with an increased number of women in the work force and increase in hours worked has altered eating patterns for families and this means that children from all types of socioeconomic backgrounds are now at risk for breakfast skipping.

2.6.1. Effect of socio economic factors on breakfast consumption

According to WHO, 2006, socio economic status is a major determinant of health and nutritional status which helps in terms of adequate availability of food (quantity as well as quality), food practices, cultural traditions and allocation of the food in the household. Schools, communities and families are the major settings that influences the way adolescents grow up, decision on breakfast consumption and the choices of the right food to consume and thus, family income has been observed to be the most important factor in determining the quality of these settings, nutritional and health status of the adolescents (National Research Council, 1995).

Majority of the low income families tend to skip breakfast or purchase less nutritious cheap food items as a means to cope with the situation or reduce intake of food. which will not meet the nutritional requirement of the household particularly the vulnerable groups of which adolescents are included. Nutritional requirement increases during adolescent where females require 2200 Cal./day and males 2500-3000 calorie and all the other nutrients needed for the growth and development. Therefore socioeconomic status of parent specifically income, have an adverse effect on adolescent's health (Newacheck, Hung, Park, Brindis and Irwin, 2003; Montgomery, Kiely and Pappas, 1996; Bearman and Moody, 1999).

Also, parents that are educated and well knowledgeable always take cautions of what the family consume as breakfast especially their children and the nutrient present in it unlike the uneducated mothers.

2.6.2. Role of Parents and the wider community on breakfast consumption

Parents play an important role in their children's lives. Due to the high rates of obesity and diabetes, it is very important that they model healthy eating habits. Eating habits such as consuming breakfast on a daily basis can have a positive impact. Family meals has been a strategy that has been shown to have significant influence on breakfast consumption and decrease the possibility of skipping breakfast (Videon and Manning, 2003). Family meals give parents the opportunity to speak with their children and adolescents about the importance of healthy eating.

Children acquire sense of autonomy as they grow into adolescent especially when it comes to their choice of food (Radcliffe, Ogden, Coyne and Craig, 2004). Having a variety of healthy foods to choose from in the home can aid in healthier eating habits. Also, another study found that adolescents who made their own decision about the foods they consumed were more likely to skip breakfast (Videon & Manning, 2003).

Parents have less control of their children's choices of food outside their home. In a study conducted by (Radcliffe et al., 2004) on adolescents, 20% of them purchased their breakfast on their way to school and majority of the food purchased were energy dense micronutrient-poor (EDMP).

Energy dense micronutrient-poor (EDMP) refers to foods that are high in fat and or sugar. They are also known to be processed foods (Radcliffe et al., 2004). Therefore, parents, schools and the wider community should try and encourage healthy breakfast choices.

2.6.3. Role of Peers on breakfast consumption

Unlike primary school children, most parents of in-school adolescents have lesser control over what they eat. This is because at this stage, less attention is paid to them as it is believed they can take care of themselves. Most parents do not provide packed lunches or snacks like the primary school children. What majority of them eat is largely determined by peer influence.

According to International Food Information Foundation Council (2009) and (Neill, Dinero and Allensworth, 1997), peer pressure has an impact on adolescents decision of consuming breakfast and types of food to be consumed because that is the time they want to gain peer acceptance or insist on independence from parental authority. Peer pressure can therefore, be an important determinant in breakfast consumption.

2.7. Breakfast and nutritional status

Breakfast consumption serves as an important factor that contribute to nutrient intake throughout the day as well as micronutrient intakes are significantly increased in adolescents who consume breakfast compare to those who skip breakfast in which the micronutrients they missed out can not be made up throughout the rest of their day (Dubois, 2005; Matthys, 2006 and Nicklas, Reger, Myers and O'Neil, 2000; Rampersaud et al., 2005 and Reddan, Wahlstrom and Reicks 2002). According to the United States Department of Agriculture: Food and Nutrition Service 2001, breakfast consumption provides vitamins and minerals relative to its energy contribution than lunch or dinner. Studies have shown that adolescents who consume breakfast have better eating habits overall than those who do not consume breakfast (Nicklas et al., 2000; Reddan et al., 2002 and Siega-Riz, Popkin and Carson, 2000) and those who skip breakfast are more likely to be frequent consumers of un healthful snack foods while breakfast consumers are more likely to meet the recommendations for fruits and vegetables (Utter et al., 2007).

Nutritional adequacy of adolescent breakfast consumers, which contains vitamin A, vitamin B6, vitamin B12, vitamin C, riboflavin, calcium, zinc, and iron intakes were higher in adolescents who regularly consumed breakfast in comparison to those who typically skip breakfast (Rampersaud et al., 2005 and Siega-Riz et al., 2000). Apart form the micronutrient intakes, breakfast also contribute to adolescent macronutrient intakes. Presence of higher intakes of protein, total carbohydrate and dietary fibers among breakfast consumers compare to those who skip breakfast (Affenito, Thompson, Barton, Franko, Daniels, Obarzanek, Schreiber and Striegel-Moore 2005; Nicklas et al., 2000; Rampersaud et al., 2005; Reddan et al., 2002 and Timlin and Pereira, 2008).

According to the 2005 Dietary Guidelines for Americans, five nutrients of concern for adolescent population such as calcium, potassium, fiber, magnesium, and vitamin E were identified. The nutrients of concern were therefore identified by dietary intake data or evidence of public health problems, which concluded that adolescents were not meeting recommendations for the specified nutrients. Breakfast has been observed to provide about 29% of daily calcium intake, 21% of daily magnesium intake, 22% of daily potassium intake, 18% of daily fiber intake, and 14% of daily vitamin E intake (U.S. Department of Agriculture: Agricultural Research Service, 2008). The contribution of nutrients from breakfast supports the importance of breakfast as a vital component of daily nutrient intake.

Therefore, breakfast consumers are not only getting essential nutrients during breakfast, but throughout the entire day. They tend to consume a more nutrient-rich diet as compared to those who skip breakfast which in turn provide essential nutrients and prepare them mentally for their day (Nicklas et al., 2000; Reddan et al., 2002 and Siega-Riz et al., 1998).

2.8. Body Mass Index

Body mass index is an index that is used to indicate underweight, overweight and obesity in individuals. It can be used to assess the nutritional status of children and adolescents as well as adults. It is calculated as weight in kilograms divided by square of the height in meters.

The WHO definition is:

- a BMI that is less than18.50 is underweight
- a BMI that is between 18.50-24.99 is normal
- a BMI greater than or equal to 25 is overweight
- a BMI greater than or equal to 30 is obesity.

BMI provides the most useful population-level measure of overweight and obesity as it is the same for both sexes and for all ages of adults. However, it should be considered a rough guide because it may not correspond to the same degree of fatness in different individuals (WHO, 2015).

Raised BMI is a major risk factor for non-communicable diseases such as: cardiovascular diseases (mainly heart disease and stroke), which were the leading cause of death in 2012; diabetes; musculoskeletal disorders (especially osteoarthritis - a highly disabling degenerative disease of the joints); some cancers such as endometrial cancer, breast cancer, and colon cancer (WHO, 2015). The risk for these non-communicable diseases increases, with an increase in BMI (WHO, 2015).

2.9. Public health strategies to promote breakfast consumption among adolescents

a. School breakfast programme (SBP) should be organized in schools which must meet the applicable recommendations of the Dietary Guidelines for Americans. Breakfasts must provide one-fourth of the Recommended Dietary Allowance for calories, protein, calcium, iron, vitamin A, and vitamin C. Each schools should decide on what food to prepare and serve based on these requirements (United States Department of Agriculture: Food and Nutrition Service, 2008). School Breakfast Programme participation serves as a protective factor against childhood obesity by encouraging students to consume a school breakfast, which might influence the distribution of their energy intake during the course of a day (Gleason, 2009). The universal SBP enables schools to provide breakfast to all students for free regardless of household income. This significantly increases breakfast participation levels (Reddan, 2002 and Food and Research Action Center, 2009). It also removes the aforementioned stigma associated with school breakfast by providing all students breakfast at no cost. For example, the Universal SBP which was piloted in six elementary schools in a Midwestern state over a 3-year period, and statistics were matched against control sites that did not participate in the Universal SBP. Breakfast consumption rates were higher in the schools with the pilot program. Students were less likely to report skipping breakfast because of weight-related concerns or because they did not want others to see them eating in the cafeteria.

b. Policies on breakfast consumption should be made so as to encourage parents to provide breakfast for their wards.

c. During Parent Teachers Association meeting, issues related to breakfast should be discussed so that parents will be aware of the importance.

d. Seminars on the importance of providing a nutritious breakfast should be organized in schools and parents of each ward should be invited.

e. Parents should serve as a role-model to their children by consuming breakfast before leaving for work and also providing a well packaged and nutritious food for their children to school.
f. Charts on the importance of breakfast and the types of food to be consumed as breakfast should be displayed in classrooms.
g. Teachers should encourage student on breakfast consumption before leaving the school premises to their various homes.
h. Letters or circular containing types of food to be consumed as breakfast and its importance should be sent to the parents via their wards.
i. Adolescents should be educated on weight-conscious most especially the female ones who believe skipping breakfast is an effective weight management strategy and that eating a healthful breakfast may aid weight management efforts.

2.9. Theoretical framework

The preceede framework will be adopted in this study. The framework outlines and describes the behavioural antecedents factors that influence whether breakfast will be consumed or skipped among the in-school adolescents.

Developed by Green, Kreuter, and associates, PRECEDE-PROCEED provides a road map for designing health education and health promotion programs. It guides planners through a process that starts with desired outcomes and works backwards to identify a mix of strategies for achieving objectives. Because the model views health behaviour as influenced by both individual and environmental forces, it has two distinct parts: an “educational diagnosis” (PRECEDE) and an “ecological diagnosis” (PROCEED). This study shall focus on the PRECEDE model as it is relevant to the study. The PRECEDE acronym stands for Predisposing, Reinforcing, Enabling Constructs in Educational/ Environmental Diagnosis and Evaluation. Developed in the 1970s, this component of the model posits that an educational diagnosis is needed to design a health promotion intervention, just as a medical diagnosis is needed to design a treatment plan (Theory at a glance)

To initiate and sustain change or behaviour such as breakfast consumption, an individual is influenced by predisposing, reinforcing, and enabling factors.

Predisposing factors: These are the antecedents behaviour that provide rationale for the behaviour. They are knowledge, values, beliefs, attitudes, perceptions, norms, socio-demographic factors, parental control, home education, food availability, cultural practices, mass media, peer influence, body image, disease, stress, high attendance and classroom behaviour and socio-economic status of the parent. Most adolescents are predisposed to the initiation of skipping breakfast partly due to their perceived state of maturity, independence for making decisions and peer influence. Predisposing factors have the potential to influence the decisions taken about their health and their resultant health behaviour. They do this by either encouraging the behaviour or by inhibiting the behaviour from occurring.

Enabling factors: These factors comprise of another set of antecedents behaviour because they also influence the realization of motives, aspirations and decisions. These include freedom of choice, self-efficacy/discipline, socio-economic status, food preference, time. These factors influence the establishment of the behaviour.

Reinforcing factor: These comprise of the feedback or influence of significant others or people or media which influences the continuance or discontinuance of a particular behaviour after it has been initiated or established. Examples of these factors include pressure from peers, teachers, parents, presence of food canteens in school, availability of fast foods at perceived lower cost, mass media, appeals of food (taste and aroma) and other social support groups. They are also factors subsequent to behaviour that provide perpetual rewards or incentives for the behaviour and contribute to its persistence.

Conceptual framework

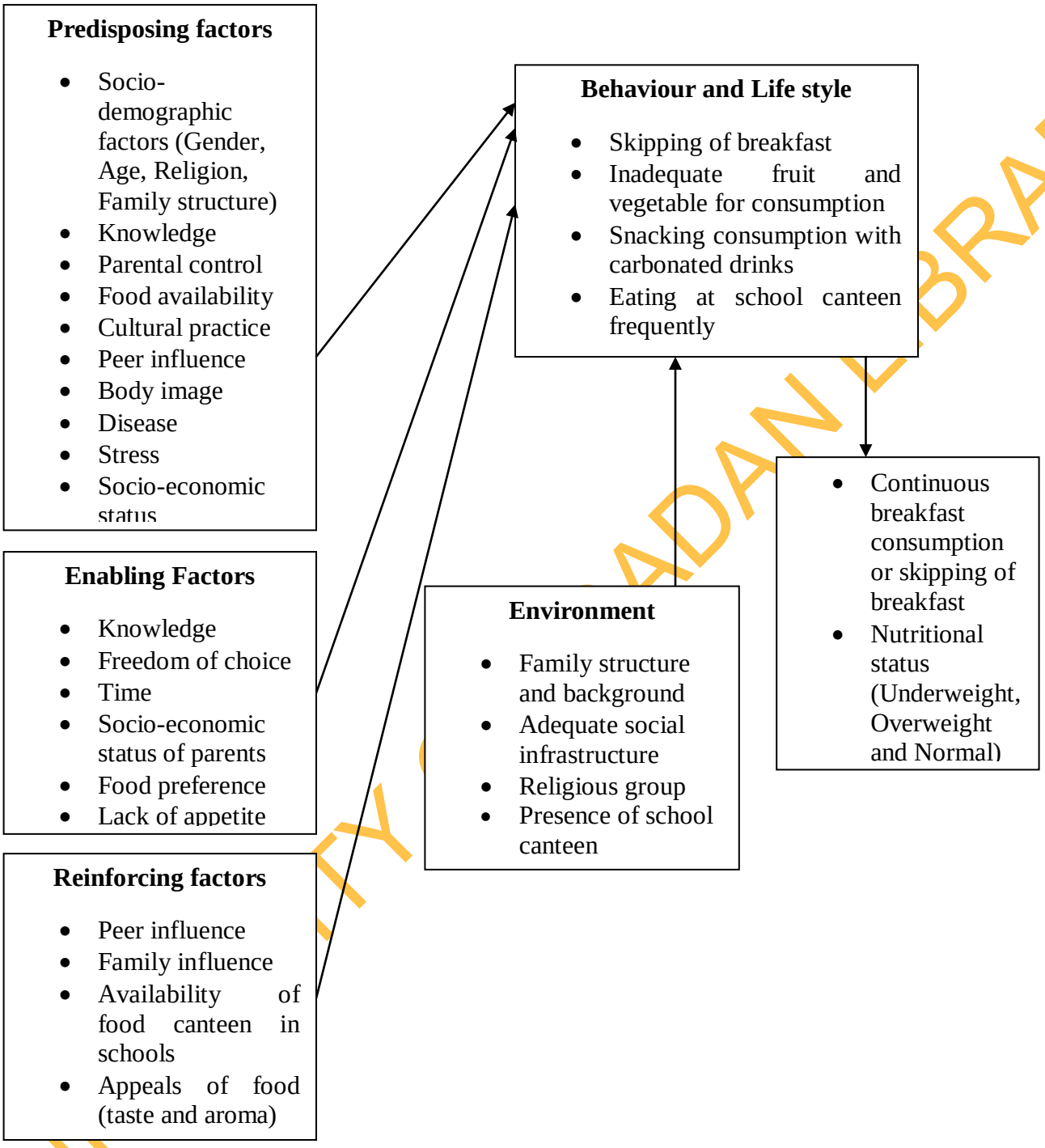


Figure 2.1 Precede framework illustrating the factors influencing breakfast consumption pattern

CHAPTER THREE

METHODOLOGY

3.1. Study Design

A descriptive cross sectional survey design was used to assess the breakfast consumption pattern and nutritional status among in-school adolescents in Ibadan North Local Government Area, Oyo state. Nigeria.

3.2. Study Location

This study was carried out in Ibadan the capital of Oyo state. Oyo State is a South Western State in Nigeria. The State was created in 1976 out of the old Western region and has a population of 5,580,894 (National Population Census, 2006). Ibadan is located between longitude 70 20' and 70 40' East of the Greenwich meridian and between latitude 30 55'and 40 10' North of the equator. The city lies in the equatorial rain forest belt and has a land area of 445 – 455km^2. Ibadan North local government, from which the study population was drawn, is one of the 33 local government Areas (LGA) present in Ibadan, Oyo state, Nigeria. The total population of Ibadan-north is 308,119 with population of adolescent being 60,570 (National population Census, 2006). Ibadan–north local government consists of 12 wards with its headquarters located at Agodi, Gate Ibadan. The inhabitants of Ibadan-north local governments consists of multi-ethnic nationalities predominately dominated by the Yorubas. The LGA houses several educational institutions such as the Premiere University of Ibadan, University College Hospital (UCH), the Polytechnic Ibadan. There are a total number of 87 secondary schools, 45 public/government schools and 47 registered private schools, this educational characteristics places Ibadan-north Local Government at advantage over every other local government areas in Ibadan. Also, within the local government are several health centres, Adeoyo Hospital and several other Primary Health Care and Heath Posts located in different wards.

The government educational policy in secondary schools do not emphasize breakfast consumption. In some of the schools, local food vendors sell all sorts of food items around the school premises but it is not known whether students purchase them for breakfast.

3.3. Study Population

The study was conducted amongst in-school adolescents in senior secondary school (SS1, 2 and 3) in Ibadan North Local Government Area of Oyo state.

3.4. Sample Size

The sample size for this research was calculated using Leslie Kish formula of

$$N = \frac{Z^2pq}{d^2}$$

Where N = minimum sample size required.

Z = standard normal deviation at 95% confidence level (1.96).

P = 77% prevalence of breakfast eaters (Lateef, Njogu, Kiplamai, Haruna and Lawal, 2016).

d = level of precision at 5% (0.05).

q = 1-p

$$N = \frac{(1.96)^2 \times 0.77 \times 0.23}{(0.05)^2}$$

$$= 272$$

A minimum sample size of 299 was used after adjusting for non-response, assuming a non-response of 10% = 27.2).

3.5. Sampling Technique

The procedure for selecting a part of the population on which research can be conducted is called sampling in research. This is to ensure that conclusions from the study can be generalized to the entire population. In order to ensure this, a multistage sampling technique was used. The stages are described as follows:

Stage 1: The list of all secondary schools in Ibadan-North Local Government (IBNLG) was obtained from the Local Education Authority. Schools were stratified into public and private schools**.**

Stage 2: Proportionate sampling was used to determine the number of schools to be selected from each stratum. 6 out of 42 registered Public schools and 7 out of 45 registered Private schools. A total of 13 registered secondary schools which equals 15% of the total registered secondary schools in Ibadan North Local Government Area, were randomly selected for the study.

Stage 3: Number of students in each classes (Senior Secondary Schools 1, 2 and 3) were obtained from the class teachers, proportionate sampling was used to determine the number of students to be selected from each classes.

Stage 4: In each of the 13 schools, 23 pupils were selected systematically, making a total of 299 students.

3.6. Inclusion Criteria

Eligible participants were in-school adolescents in senior secondary schools who consented to participate (SS1, 2 and 3).

3.7. Exclusion Criteria

All those who did not fall within the inclusion criteria were excluded from the study.

3.8. Instrument for data collection

The study was conducted using semi-structured questionnaire. It contains information on socio-demographic characteristics, level of knowledge on breakfast consumption and its perceived health benefits using 8-point scale (Score between 0-4 was categorised as Poor, while score >4 was categorised as Good), perception on breakfast consumption and its health benefits using 11-point scale (Score between 0-5 was categorised as Poor, while score >5 was categorised as Good), breakfast consumption pattern using 24-point scale (Score between 0-12 was categorised as unhealthy breakfast consumption pattern, while score >12 was categorised as healthy breakfast consumption pattern), factors influencing breakfast pattern and nutritional status using Body Mass Index was classified according to WHO (2007) classification (Underweight: <18.50, Normal: 18.50-24.99, Overweight: >=25.00 and Obese: >=30.00).

3.9. Validity of the Instrument

Relevant literatures were reviewed, the formulated objectives guide in the modification of the instrument. The instrument was also reviewed by the research supervisor and other lecturers in the department and senior colleagues. The supervisor's comments and corrections was used to further enhance the quality of the instrument.

3.10. Reliability of the Instrument

Reliability of the instrument was determined by pre-testing 10% of the instruments that was used for the study which was carried out in a Public and Private registered school (Deril Academy and Urban Day Grammar School respectively) in Egbeda Local Government Area of Oyo State. The results was subjected to Cronbach-Alpha test with aid of SPSS and a reliability coefficient of 0.928 was obtained. This confirmed its high degree of reliability. The result of the pretest was then used to modify the questions that were ambiguous to the respondents.

3.11. Data Collection procedure

Data collection took place between September and October, 2016. Four research assistants were recruited and trained to administer the instrument according to instructions. Quantitative data were collected from the students through a questionnaire. The aim of the questionnaire which was to investigate the breakfast consumption pattern and nutritional status among in-school adolescents in Ibadan North Local Government Area, Oyo state were explained to all the eligible students. The questionnaire were self-administered by the research assistants during school hours when the students were in there respective classes. Instruction and direction on how to respond to the items in the questionnaire was read by the researcher. Students who requested for clarification or who raised questions were attended to.

Weight and Height of the students using bathroom scale and metre rule respectively were also checked by the research assistants so as to get data on their Body Mass Index (BMI). The student were thanked at the end of the questionnaire administration.

3.12. Ethical Consideration

The study was submitted to the Ministry of Health Ethics Review Committee for ethical review and approval. Permission was obtained from the state Ministry of Education and permission from the principal of each schools. Written informed consent was obtained from respondents who are below 18years through their parents before administering questionnaires. Ethical issues like confidentiality, opportunity to decline interview at any stage and non-exposure to risk were also discussed with each respondents. Only respondents who were able to give informed consent were recruited into the study. The respondents were also informed that participation is voluntary and that data collected would be used mainly for research purposes. Anonymity and confidentiality of responses were ensured.

3.13. Data Management and Analysis

Data was entered directly from the pre-coded questionnaires. Computer printouts of the data were reviewed for any information that might be out of range. The statistical analysis was performed using SPSS for Windows version 20.0. Descriptive statistics such as frequencies, charts and percentages, and inferential statistics such as chi-square was used to describe the variables. The significance level was set at $p<0.05$.

3.14. Limitations of the Study

A major limitation was the Oyo State workers strike which delayed the approval of Ethical clearance from Oyo State Ethical review board and commencement of this study.

CHAPTER FOUR

RESULTS

4.1. Socio-demographic characteristics

A total of 299 in school adolescents were interviewed and the socio-demographic characteristics of the respondents were presented in the table 4.1a and 4.1b below. 149 (49.8%) of the respondents were males, while 150 (50.2%) were females. Majority of the respondents 40 (13.4%), 64 (21.4%), 98 (32.8%), 64 (21.4%) and 26 (8.7%) were of 13, 14, 15, 16 and 17 years of age respectively, while only a few of the respondents 2 (0.7%), 3 (1.0%), and 2 (0.7%) were of 11, 12 and 18 years of age respectively.

Few (7.7%) of the respondents were selected each from 6 public schools (Abadina Grammar School. UI, Methodist Grammar School. Bodija, Islamic High School. Basorun, Oba Akinyele Memorial High School. Idi-ape, Anglican Commercial Grammar School. Total Garden and Immanuel Grammar School. UI) and 7 private schools (As-sabbaq College. Bodija, Soaring Heights. Aare – Bodija, Walbrook College. Samonda, Reliance International High School. Arometa Eleyele, Subola Secondary School. Agodi G.R.A, All Soul High School. Old Bodija (Housing) and Imam Zubair Model High School. Barika Agbowo). 118 (39.5%) respondents are selected from SSS.1, 96 (32.1%) respondents were selected from SSS.2 while 85 (28.4%) respondents were selected from SSS.3. More than half 158 (52.8%) of the respondents were Christians while 141 (47.2%) were Muslims. A greater proportion 247 (82.6%) of the respondents were Yorubas, while only a few 26 (8.7%) and 26 (8.7%) were from the Hausa and the Igbo ethnic group respectively. More than half 169 (56.5%) of the respondents were from a Monogamous family while 130 (43.5%) were from a Polygamous family.

A greater proportion 220 (73.6%) of the respondents lived with their parents, only a few 35 (11.7%) , 13 (4.3%), 9 (3.0%), 13 (4.3%) and 9 (3.0%) lived with their Mother alone, Father alone, Siblings, Relatives and Guardians respectively. Majority of the respondents 177 (59.2%) do not have a house help while 122 (40.8%) of the respondents possessed a house help.

Majority 135 (45.1%) of the respondents fathers were civil servants, while most 157 (52.5%) of their mothers were traders/businesswomen.

Table 4.1a: Socio-demographic characteristics of the respondents

N=299

Variables		Frequency (n)	Percentage(%)
Age (Years)	11 years	2	0.7
	12 years	3	1.0
	13 years	40	13.4
	14 years	64	21.4
	15 years	98	32.8
	16 years	64	21.4
	17 years	26	8.7
	18 years	2	0.7
Gender	Male	149	49.8
	Female	150	50.2
School	Abadina Grammar School, UI	23	7.7
	Methodist Grammar School, Bodija	23	7.7
	Islamic High School, Basorun	23	7.7
	Oba Akinyele Memorial High School, Idi-ape	23	7.7
	Anglican Commercial Grammar School, Total Garden	23	7.7
	Immanuel Grammar School, UI	23	7.7
	As-sabbaq College, Bodija	23	7.7
	Soaring Heights, Aare - Bodija	23	7.7
	Walbrook College, Samonda		
	Reliance International High School, Arometa	23	7.7
	Eleyele	23	7.7
	Subola Secondary School, Agodi G.R.A.	23	7.7
	All Soul High School, Old Bodija (Housing)	23	7.7
	Imam Zubair Model High School, Barika Agbowo		

Table 4.1b: Socio-demographic characteristics of the respondents

N=299

Variables		Frequency (n)	Percentage(%)
Class	SS1	118	39.5
	SS2	96	32.1
	SS3	85	28.4
Religion	Christianity	158	52.8
	Islam	141	47.2
Ethnicity	Yoruba	247	82.6
	Hausa	26	8.7
	Igbo	26	8.7
Family Structure	Monogamous	169	56.5
	Polygamous	130	43.5
Mother's Occupation	Trading/Business	157	52.5
	Civil Servants	62	20.7
	Artisan	48	16.1
	Unemployed	21	7
	Others (Cook, Banker and Caterer)	11	3.7
Father's Occupation	Trading/Business	99	33.1
	Civil Servants	135	45.1
	Artisan	48	16.1
	Unemployed	6	2
	Others (Farmer, Banker, Engineer and Clergy)	11	3.7
Who do you live with?	Both Parents	220	73.6
	Mother Alone	35	11.7
	Father Alone	13	4.3
	Sibling	9	3.0
	Relatives	13	4.3
	Guardian	9	3.0
Possession of house help	Yes	122	40.8
	No	177	59.2

4.2 Knowledge of breakfast consumption and its perceived health benefits

The knowledge of breakfast consumption and it perceived health benefits of the respondents are presented in Table 4.2 below. More than half 59.5% of the respondents gave an incomplete definition of breakfast as “the first meal of the day”, 2.0% of the respondents defined breakfast as “the meal eaten to break a fast”, while only a few 38.5% were able to provide the complete (standard) definition of breakfast as “the first meal of the day, eaten before 10am in the morning”. More than half (52.5%) of the respondents were able to list correctly two types of foods best suitable for breakfast, (47.5%) were able to list correctly only one type of food best suitable for breakfast, while only a few (0.7%) declined to respond. Majority (68.2%) of the respondents provided 2 correct health benefits of breakfast consumption, Only a few 0.3% were able to provide one correct health benefit of breakfast consumption, while 31.5% of the respondents did not respond to the question. More than half (59.6%) of the respondents provided correctly 2 health implications of skipping breakfast, Only a few 6.7% provided one correct answer, while 33.7% of the respondents did not respond to the question. In general, greater proportion 66.6% of respondents had good knowledge on health benefits of breakfast consumption.

Table 4.2: Knowledge of breakfast consumption and its perceived health benefits

N = 299

Variables		Frequency (n)	Percentage(%)
What is breakfast	It is the first meal of the day	178	59.5
	It is the first meal of the day eaten before 10am in the morning	115	38.5
	It is the food eaten to break a fast	6	2.0
Food for breakfast	Rice	59	19.7
	Noodles	15	5.0
	Cereals	31	10.4
	Oat meal	37	12.4
	Noodles or spaghetti and egg/ Pap and bean cake or moi-moi	50	16.7
	Rice and stew/Plantain and Egg	9	3.0
	Bread and tea/ Rice and stew	20	6.7
	Cereals/Oat meal	63	21.1
	Fruits/ Bread and tea	13	4.3
	No response	2	0.7
Importance of Consuming Breakfast	To improve mood/ To be alert	106	35.5
	Important for cognitive functions/ Helps in academic performance	71	23.7
	It provides energy for metabolic activities/ reduction of chronic disease	27	9.0
		1	0.3
	Important for cognitive function	94	31.5
Effects of missing breakfast	Excess weight gain/Tendency of developing a chronic disease	60	20.1
	Poor academic performance/ Tendency of developing a chronic disease	118	39.5
		17	5.7
	Poor academic performance	3	1.0
	Excess weight gain	101	33.7

4.3. Perception of breakfast consumption and its health benefits

The perception of breakfast consumption and its health benefits of the respondents are presented in Table 4.3 below. Majority 274 (91.6%) of the respondents perceived to be more active when they consume breakfast, while 25 (8.4%) did not perceive that. However, majority 213 (71.2%) were of the perception that their daily activities were not affected by breakfast consumption, while only 86 (21.8%) perceived that their daily activities were affected by breakfast consumption. A greater proportion 279 (93.3%) of the respondents perceived that breakfast consumption enhanced their performance in school. About 230 (76.9%) of the respondents perceived that they consider themselves not fully alert until they have had breakfast. Many 249 (83.3%) were of the perception that students who take breakfast make better food choices during the day, while 106 (35.3%) did not perceive that skipping breakfast makes them consume more during lunch. More than half 175 (58.5%) of the respondents were of the perception that breakfast consumption is important for cognitive function and academic performance.

However, majority 193 (64.5%) of the respondents were not of the perception that breakfast consumption makes them feel sluggish. Greater proportion 248 (82.9%) of the respondents perceived that breakfast consumption improves their mood, while more than half 203 (67.9%) of the respondents did not consider themselves at risk of any chronic diseases later in life as a result of skipping breakfast. A greater proportion 222 (74.2%) perceive that breakfast consumption makes them add weight. In general, more than half 52.8% of the respondents had good perception of the health benefits of breakfast consumption.

Table 4.3: Perception of breakfast consumption and its health benefits

N=299

Variables		Frequency (n)	Percentage (%)
Eating breakfast helps in doing better in school	Yes**	279	93.3
	No*	20	6.7
I think my daily activities are not affected by breakfast	Yes*	213	71.2
	No**	86	28.8
I tend to be more active on eating breakfast	Yes**	274	91.6
	No*	25	8.4
I consider myself not fully alert until I have had breakfast?	Yes**	230	76.9
	No*	69	23.1
Students who eats breakfast makes better choices during the day	Yes**	249	83.3
	No*	50	16.7
I do not think breakfast is important for cognitive function and academic performance	Yes*	124	41.5
	No**	175	58.5
Missing breakfast makes me consume more during lunch	Yes**	193	64.5
	No*	106	35.5
Breakfast improves my mood	Yes**	248	82.9
	No*	51	17.1
I think after eating breakfasts I feel sluggish	Yes*	106	35.5
	No**	193	64.5
I do not consider myself at any risk of chronic diseases later in life whenever I miss breakfast	Yes*	203	67.9
	No**	96	32.1
I think eating breakfasts makes me add weight	Yes*	222	74.2
	No**	77	25.8

**Correct
*Incorrect

4.4. Breakfast consumption pattern

As shown in Table 4.4a and 4.4b below: All 299(100.0%) of the respondents concurred that they consume breakfast. However, majority of the respondents 190 (63.5%) do not consume breakfast everyday while 109 (36.5%) consume breakfast regularly. About 109 (36.5%) of the respondents had breakfast everyday of the week, while 76 (25.4%), 18 (6.0%) , 45 (15.1%) and 51 (17.1%) of the respondents had irregular breakfast in a week, ≤ 6 days a week, 3-5 days a week and ≤ 2 days a week respectively. Majority of the respondents 144 (48.2%) had irregular breakfast consumption throughout the month while 109 (36.5%) of the respondents consume breakfast throughout the month and only a few 46 (15.4%) of the respondents rarely consume breakfast within the month. Greater proportion 202 (67.6%) of the respondents reported they took breakfast on the day of the interview, while 97 (32.4%) of the respondents did not take breakfast on that day.

More than half of the respondents 197 (65.9%) consume breakfast at 7am before going to school, while 22 (7.4%) and 29 (29%) consume breakfast at 6am and 8am respectively and only 51 (17.1%) do not consume breakfast to school. About 261 (87.3%) of the respondents consume breakfast before 10am during weekends while, only a few 38 (12.7%) consume breakfast after 10am. Majority of the respondents 109 (36.5%) had regular breakfast consumption while 101 (33.8%), 46 (15.4%) and 43 (14.4%) miss breakfast during school days, on Saturdays and Sundays respectively. In general, greater proportion 53.2% of respondents had a healthy breakfast consumption.

A greater percentage 48.8% of the respondents had ready-to-eat cereal (cornflakes, rice crispy, etc) for breakfast everyday, while 9.7%, 12.4% and 21.7% had ready-to-eat cereal for breakfast 1-2 times, 3-4 times and 5-6 times in a week respectively. About 7.4% of the respondents reported that they never consumed ready-to-eat cereal for breakfast. Greater proportion 42.1% had Bread and tea/beans for breakfast 5-6 in a week, 11.7% and 15.7%, 18.4% of the respondents had Bread and tea/beans for breakfast 1-2 times, 3-4 times and everyday of the week respectively, while only a few 12.0% reported that they never consumed Bread and tea/beans for breakfast. Majority 45.8% of the respondents never had cooked breakfast (noodles) for breakfast, while 21.1 %, 10.4%, 11.0% and 11.7% had cooked breakfast 1-2 times, 3-4 times, 5-6 times and everyday of the week.

A Greater proportion 38.8% of the respondents consume pap and beancake/moimoi everyday of the week for breakfast while 8.4%, 9.7%, 30.4, and had pap and beancake/moimoi for breakfast 1-2 times, 3-4 times and 5-6 times respectively. However, 12.7% of the respondents reported that they never consumed pap and beancake/moimoi for breakfast. About, 29.1% of the respondents reported taking Oatmeals everyday of the week for breakfast while only few 10.4% reported they never had Oatmeals for breakfast.

Majority 41.8% of the respondents reported they never consumed plantain and egg, while 21.7% reported that they consume plantain and egg 1-2 times in a week for breakfast. 24.1% of the respondents never consumed rice and stew, while majority 45.2% reported that they consumed rice and stew for breakfast 5-6 times in a week. About 24.4% of the respondents never consumed sphagetti, while majority 46.5% reported they consumed sphagetti for breakfast 5-6 times in a week. Greater proportion of the respondents (36.1%) consume fruits and vegetables for breakfast everyday of the week, while only few 7.0% reported they never had fruits and vegetables for breakfast.

Table 4.4a: breakfast consumption pattern

N=299

Variables		Frequency (n)	Percentage (%)
Do you eat breakfast?	Yes always	109	36.5
	Yes sometimes	190	63.5
If Yes always or Yes sometimes, how often do you eat breakfast in a week?	Everyday	109	36.5
	≤ Six days a week	18	6.0
	Three to five days a week	45	15.1
	Two days a week	51	17.1
	Irregular	76	25.4
How often do you eat breakfast in a month?	Everyday	109	36.5
	Irregular	144	48.2
	Rarely	46	15.4
Did you take breakfast this morning?	Yes	202	67.6
	No	97	32.4
What time do you normally take breakfast during school days?	6am	22	7.4
	7am	197	65.9
	8am	29	29
	I don't take breakfast during school days	51	17.1
What time do you normally take breakfast during the weekend?	Before 10 am	261	87.3
	After 10 am	38	12.7
Have you ever missed breakfast before?	Yes	190	63.5
	No	109	36.5
How often do you miss breakfast in a week?	Never	109	36.5
	<two days a week	24	8.0
	three to five days a week	48	16.1
	<six days a week	45	15.1
	Irregular	73	24.4
When do you miss breakfast the most?	School Days	101	33.8
	Saturdays	46	15.4
	Sundays	43	14.4
	I don't miss breakfast	109	36.5

Table 4.4b: breakfast consumption pattern

N=299

How often do you eat the following during breakfast in a week?	1-2 times (%)	3-4 times (%)	5-6 times (%)	Everyday (%)	Never (%)
Ready-to-eat Cereals (cornflakes, Golden morn, etc.)	9.7	12.4	21.7	48.8	7.4
Bread and tea/beans	11.7	15.7	42.1	18.4	12.0
Cooked Breakfast (noodles, egg, etc.)	21.1	10.4	11.0	11.7	45.8
Pap and bean cake/ moi-moi	8.4	9.7	30.4	38.8	12.7
Plantain and egg	21.7	9.4	9.7	17.4	41.8
Rice and stew	9.7	9.7	45.2	11.4	24.1
Sphagetti	9.0	6.4	46.5	13.7	24.4
Fruits/Vegetables	9.0	19.1	28.8	36.1	7.0
Oatmeal	18.1	21.1	21.4	29.1	10.4

4.5. Factors influencing breakfast consumption pattern of the respondents

4.5.1. Factors that influence breakfast consumption

As shown below in Table 4.5a below: Majority of the respondents 280 (93.6%), 192 (64.2%), 245 (81.9%), 227 (75.9%) and 218 (72.9%) reported taking breakfast to boost academic performance, friends consuming breakfast always before coming to school, to gain energy, to improve mood and to be alert respectively, while greater proportion 205 (68.6%) and 198 (66.2%) reported taking breakfast due to adequate knowledge on the benefit of breakfast consumption and health effect of skipping breakfast respectively. Only a few 101 (33.8%) reported they had breakfast due to their health condition (ulcer).

Table 4.5a: Factors that influence breakfast consumption

N=299

Variables		Frequency (n)	Percentage (%)
To boost my academic performance	Yes	280	93.6
	No	16	5.4
	I don't know	3	1.0
Health reasons (Ulcer)	Yes	101	33.8
	No	197	65.9
	I don't know	1	0.3
My friends consume breakfast always before coming to school	Yes	192	64.2
	No	30	10.0
	I don't know	77	25.8
To gain energy	Yes	245	81.9
	No	31	10.4
	I don't know	23	7.7
To improve my mood	Yes	227	75.9
	No	43	14.4
	I don't know	29	9.7
To be alert	Yes	218	72.9
	No	44	14.7
	I don't know	37	12.4
Knowledge on the benefits of breakfast consumption	Yes	205	68.6
	No	58	19.4
	I don't know	36	12.0
Knowledge on the health effects associated with not eating of breakfast	Yes	198	66.2
	No	69	23.1
	I don't know	32	10.7

4.5.2. Factors that discourage breakfast consumption

As shown in Table 4.5bi and 4.5bii: About 109 (36.5%) of the respondents reported they never skipped breakfast while Majority 115 (38.5%) of the respondents reported that their busy schedules (no time to eat) prevented them from taking breakfast, while 104 (34.8%) of the respondents reported they skip breakfast because they do not like the food served as breakfast. Greater proportion 114 (38.1%) of the respondents reported that their skipping breakfast was due to insufficient time to eat. However, slightly below average 61 (20.4%) and 55 (18.4%) reported they skip breakfast due to parents refusal to provide breakfast and parents not consuming breakfast to work respectively.

Majority 140 (46.8%) reported that they skipped breakfast just to lose weight, while 119 (39.8%) skipped breakfast due to the lack of appetite. More than half 153 (51.2%) of the respondents reported skipping breakfast because they wake up late, while about 137 (45.8%) of the respondents reported that they skipped breakfast because it takes too much time to prepare. However, 98 (32.8%) and 101 (33.8%) attributed skipping of breakfast due to lack of knowledge on the benefits of consuming breakfast and health effect associated with skipping of breakfast respectively.

Table 4.5bi: Factors that discourage breakfast consumption

N=299

Variables		Frequency (n)	Percentage (%)
Busy schedule (no time to eat)	Yes	115	38.5
	No	43	14.4
	I don't know	32	10.7
	I don't miss breakfast	109	36.5
Do not like the food served as breakfast	Yes	104	34.8
	No	50	16.7
	I don't know	36	12.0
	I don't miss breakfast	109	36.5
Insufficient time to eat	Yes	114	38.1
	No	45	15.1
	I don't know	31	10.4
	I don't miss breakfast	109	36.5
My parents refused to provide breakfast	Yes	61	20.4
	No	124	41.5
	I don't know	5	1.7
	I don't miss breakfast	109	36.5
My parents do not eat breakfast before going to work	Yes	55	18.4
	No	131	43.8
	I don't know	4	1.3
	I don't miss breakfast	109	36.5
Lack of appetite	Yes	119	39.8
	No	54	18.1
	I don't know	17	5.7
	I don't miss breakfast	109	36.5
To loose weight	Yes	140	46.8
	No	46	15.4
	I don't know	4	1.3
	I don't miss breakfast	109	36.5
I wake up late	Yes	153	51.2
	No	27	9.0
	I don't know	10	3.3
	I don't miss breakfast	109	36.5
It takes too much time to prepare	Yes	137	45.8
	No	25	8.4
	I don't know	28	9.4
	I don't miss breakfast	109	36.5

Table 4.5bii: Factors that discourage breakfast consumption

N=299

Variables		Frequency (n)	Percentage (%)
Lack of knowledge on the benefits of breakfast consumption	Yes	98	32.8
	No	61	20.4
	I don't know	31	10.4
	I don't miss breakfast	109	36.5
Lack of knowledge on the health effects associated with not eating of breakfast	Yes	101	33.8
	No	55	18.4
	I don't know	34	11.4
	I don't miss breakfast	109	38.5

4.6. Nutritional status using Body Mass Index (BMI)

As shown in Figure 4.1 below: Majority of the respondents 50.2% had a normal weight (18.50 – 24.99), while only few of the respondents 30.4%, 1.7% and 17.7% were overweight (> or =25.0), obese (> or =30.0) and underweight (<18.50) respectively.

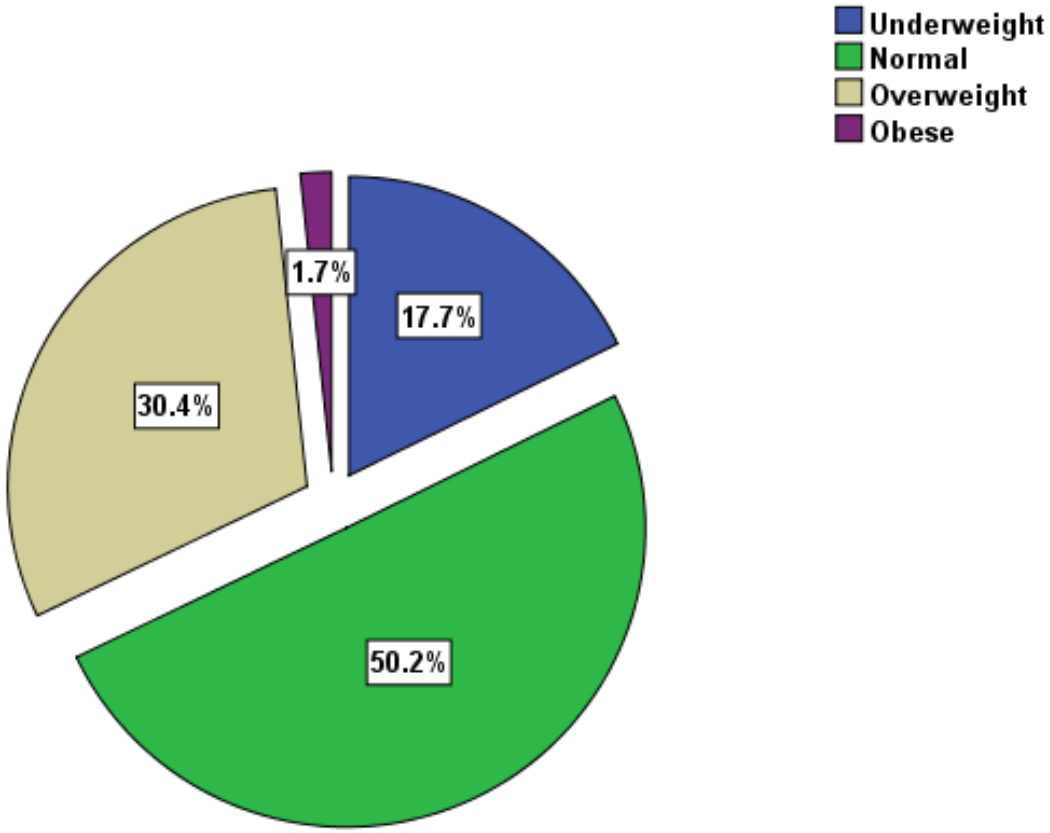
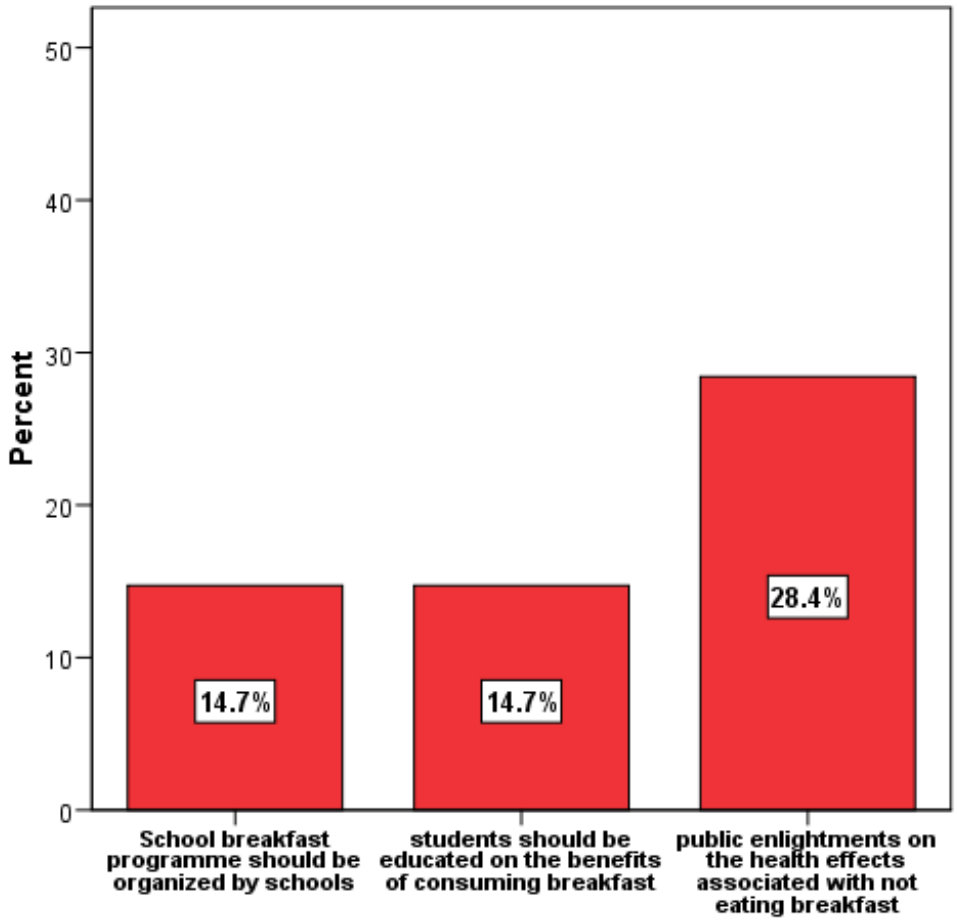


Figure 4.1: Nutritional status of respondents using body mass index (bmi)

4.7 Suggestions for improving Breakfast Consumption in Secondary schools.

As shown in Figure 4.2 below: 3 suggestions were made by the respondents. Greater proportion of the respondents 42.2% did not respond to the question on suggestions while few of the respondents 14.7%, 28.4% and 14.7% suggested " School breakfast programme should be organized by schools, public enlightments on the health effects associated with skipping breakfast and students should be educated on the benefits of consuming breakfast".



- **Missing responses were left out**

Figure 4.2: Suggestions made by the respondents

4.8. Test of Hypotheses

The results of the hypothesis tested are shown below:

Hypothesis 1: There is no significant relationship between breakfast consumption pattern and nutritional status among the respondent. The result of the finding is shown in Table 4.6 below. Chi- square was used to test for a relationship between breakfast consumption pattern and nutritional status among the respondent, and it was found that there is a statistically significant association between breakfast consumption pattern and nutritional status of the respondents (X^2 =70.990 ; P =<0.001). This meant that pattern of breakfast consumption had a significant influence on the nutritional status of the respondents. Therefore, the null hypothesis was rejected.

Hypothesis 2: There is no significant relationship between the level of knowledge of the perceived health benefits of breakfast consumption and pattern of breakfast consumption among respondents**.** The result of the finding is shown in Table 4.7 below. Chi- square was used to test for a relationship between the level of knowledge of the perceived health benefits of breakfast consumption and pattern of breakfast consumption among respondents, and it was found that there is no statistically significant association between knowledge of health benefits of breakfast consumption and pattern of breakfast consumption among the respondents (X^2 =0.286; P =0.593). This meant that the level of knowledge of the respondents on the perceived health benefits of breakfast consumption had no significant influence on the pattern of breakfast consumption. Therefore, the null hypothesis was accepted.

Hypothesis 3: There is no significant relationship between breakfast consumption pattern and family structure of respondents. The result of the finding is shown in Table 4.8 below. Chi-square was used to test for a relationship between breakfast consumption pattern and family structure among the respondents and it was found that there is no statistically significant association between breakfast consumption pattern and family structure of respondents (X^2 =0.041 ; P =0.893). This meant that family structure of the respondents had no significant influence on the pattern of breakfast consumption. Therefore, the null hypothesis was accepted.

Hypothesis 4: There is no significant relationship between breakfast consumption pattern and gender of respondents. The result of the finding is shown in Table 4.9 below. Chi- square was used to test for a relationship between breakfast consumption pattern and gender among the respondents and it was found that there is no statistically significant association between breakfast consumption pattern and gender of respondents (X^2 =0.003 ; P =0.957). This meant that gender of the respondents had no significant influence on the pattern of breakfast consumption. Therefore, the null hypothesis was accepted.

Table 4.6: Relationship between breakfast consumption pattern and nutritional status among the respondent

N=299

Variables	Underweight	Normal	Overweight	Obese	Chi Square (X^2)	P-Value
Breakfast Consumption Pattern						
Unhealthy breakfast consumption pattern	36	34	66	4	70.990	<0.001 *
Healthy breakfast consumption pattern	17	116	25	1		
Total	53	150	91	5		

Ho= Rejected

*** Chi-square was used**

Table 4.7: Relationship between knowledge score and pattern of breakfast consumption

N=299

Variables	Unhealthy Breakfast Consumption Pattern	Healthy Breakfast Consumption Pattern	Chi Square (X^2)	P- Value
Knowledge of Health Benefits of Breakfast Consumption				
Good	91	108	0.286	0.593
Poor	49	51		
Total	140	159		

Ho= Accepted

*** Chi-square was used**

Table 4.8: Relationship between family structure and pattern of breakfast consumption

N=299

Variables	Unhealthy Breakfast Consumption Pattern	Healthy Breakfast Consumption Pattern	Chi Square (X^2)	P- Value
Family Structure				
Monogamous	80	89		
Polygamous	60	70	0.041	0.839
Total	140	159		

Ho= Accepted

*** Chi-square was used**

Table 4.9: Relationship between gender and pattern of breakfast consumption

N=299

Variables	Unhealthy Breakfast Consumption Pattern	Healthy Breakfast Consumption Pattern	Chi Square (X^2)	P- Value
Gender				
Male	70	79		
Female	70	80	0.003	0.957
Total	140	159		

Ho= Accepted

*** Chi-square was used**

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1. Respondents' Socio-demographic characteristics

The ages of respondents range from 11 to 18 years of age. This denotes that they were adolescents (10-19 years). Barton et al., 2005; Keski- Rahkonen et al., 2003; Song et al., 2005; reported that skipping of breakfast tends to increase with age after childhood and appears to be most frequent in adolescents which are consistent with the findings of this study. Breakfast is the most commonly skipped meal in adolescence (Timlin and Pereira, 2008) which is similar to a study carried out in the United States that breakfast consumption pattern between 1965 and 1991 for children and adolescents indicates a decline in breakfast consumption, particularly for older adolescents aged 15- 18 years (Siega-Riz et al., 1998).

A greater proportion 247 (82.6%) of the respondents were of the Yoruba ethnic group for the obvious reason that the schools used for the study are located in the South Western part of Nigeria and majorly populated by this ethnic group. Majority 220 (73.6%) of the respondents lived with their parents. Also, more than half 169 (56.5%) of the respondents were from a Monogamous family. All these could influence their breakfast consumption pattern and nutritional status (Hallstrom et al., 2011; Hoyland et al., 2012; Merten et al., 2009 and Tin et al., 2011).

5.2. Respondents' knowledge of the perceived health benefits of breakfast consumption

Findings from this study revealed that the knowledge of respondents on health benefits of breakfast consumption is good and a contributing factor could be that the respondents were within the academic settings.. The question 'What is breakfast?' was used to access their knowledge, more than half 59.53% of the respondents gave an incomplete definition of breakfast as "the first meal of the day", 2.01% of the respondents defined breakfast as "the meal eaten to break a fast", while only a few 38.46% were able to provide the complete (standard) definition of breakfast as "the first meal of the day, eaten before 10am in the morning" which is consistent with Giovannini et al. (2008) who defined breakfast "as the first meal of the day, eaten before or at the start of daily activities, within the 2 hours of waking, typically no later than 10am".

This contrasts with perhaps more methodical definitions that have been previously published which describe breakfast as being a certain number of calories consumed (Cho et al., 2003). However, the National Health and Nutrition Examination Survey (NHANES III) in the U.S. described breakfast as 'any food or beverage consumed in a meal occasion named by the respondent as breakfast' (Cho et al., 2003), not dissimilar to the 59.53% of respondents in this study who described breakfast as being simply 'the first meal of the day', that is, those who gave an incomplete definition of breakfast.

Respondents were also asked to list 2 types of foods best suitable for breakfast, 2 health benefits of breakfast consumption and 2 health implications of skipping breakfast. Most (99.3%) of the respondents were able to list at least one correct food that is suitable for breakfast which includes ready- to- eat- cereals, oatmeals, noodles, pap and moimoi/akara, fruits, bread and tea, rice and stew. It has been suggested that consuming a breakfast that includes cereal is beneficial to overall nutrient intake, as some cereals are indeed low in fat, good sources of complex carbohydrates, fortified with essential nutrients, and high in dietary fibre (Barton et al., 2005).

A greater proportion (68.5%) of the respondents gave at least one correct health benefit of breakfast consumption which includes improved mood, alertness, improved cognitive functions and academic performance, reduction of chronic diseases, provide energy for metabolic activities. This is supported by Gibson and Gunn, (2010) which confirmed that breakfast consumption has been associated with a multitude of health-related benefits and improved mood (Defeyter and Russo, 2013). Consumption of breakfast is a dietary pattern which contributes positive benefits in nutrition, cognitive function (Albertson et al., 2011; Rampersaud et al., 2005; Pearson et al., 2009), academic performance (Pagano and Murphy, 2002; Boey, et al., 2003; Kim et al., 2003), prevention of metabolic syndrome and weight gain (Van der Heijden et al., 2007; Thompson-McCormick et al., 2010; Astbury et al., 2011) and reduced risk of developing chronic diseases (World Health Organization, 2003).

More than half (66.3%) of the respondents gave at least one correct health implications of skipping breakfast which includes excess weight gain, tendency of developing chronic diseases and poor academic performance. This is consistent with Timlin and Pereira, 2007; De Flot et al., 2000; Sjoberg et al., 2003; De la Hunty and Ashwell, 2007, shows that skipping breakfast is associated with excess weight gain and other adverse health outcomes.

5.3. Respondents' perception of breakfast consumption and its health benefits

Findings from this study revealed that the perception of respondents on health benefits of breakfast consumption is good and a contributing factor could be that the respondents were within the academic settings. Perception of breakfast may also influence a person's likelihood of consuming breakfast and subsequent psychological reactions to this meal (Chapman et al., 1998; Reeves et al., 2013). This is in contrast with the findings from this study which found the relationship between the perception of the respondents and pattern of breakfast consumption is not statistically significant with P =0.996.

Majority (74.2%) of the respondents was of the perception that breakfast consumption results to excess weight gain. These findings are consistent with Wardle et al., (2000) who found no difference in self-reported breakfast eating habits of UK adults who were watching their weight or wanting to lose weight and adults who were happy with their weight, but in contrast with a wealth of data which indicated that regular breakfast consumption has also been associated with a healthier body mass index and reduced likelihood of obesity development in adults and children alike (de la Hunty and Ashwell 2007; Szajewska and Ruszczynski 2010); it may also be protective of weight gain over time (Ask et al., 2006; Albertson et al., 2007).

Evidence also suggests that breakfast consumption can enhance cognitive function and academic performance, as well as improve mood (Wesnes et al., 2003; Widenhorn-Muller et al., 2008; Hoyland et al., 2009) which is consistent with the findings of this study. More than half (58.5%) perceived breakfast to be important for cognitive function and academic performance, while majority 82.9% perceived that breakfast consumption improved their mood. In contrast , Unusan, Sanlier, and Danisik, (2006) compared attitudes to breakfast in Turkish children living in Turkey and Germany and found that those living in Turkey reported significantly more positive effects associated with breakfast, whereas significantly more children in Germany perceived that breakfast made them feel tired. This is inconsistent with the findings of this study where only few (35.5%) perceived that breakfast consumption makes them feel sluggish.

A greater proportion (71.2%) were of the perception that their daily activities were not affected by breakfast consumption, while 23.1% do not perceived themselves not fully alert until they have had breakfast.

Majority (83.3%) perceived that breakfast consumption helps them make better food choices during the day and this correlates with better food choice and consequently better intake of essential nutrients as a result of breakfast consumption reported by Sugiyama et al., (2012).

However, many (64.5%) were of the perception that they consume more food during lunch as a result of missing breakfast. According to the United States Department of Agriculture: Food and Nutrition Service 2001, breakfast consumption provides vitamins and minerals relative to its energy contribution than lunch or dinner. Studies have shown that adolescents who consume breakfast have better eating habits overall than those who do not consume breakfast (Nicklas et al., 2000; Reddan et al., 2002 and Siega-Riz, Popkin and Carson, 2000) and those who skip breakfast are more likely to be frequent consumers of unhealthful snack foods while breakfast consumers are more likely to meet the recommendations for fruits and vegetables (Utter et al., 2007) which are consistent with these findings.

5.4. Respondents' pattern of breakfast consumption

Findings from this study revealed that 63.5% of the respondents skipped breakfast or had infrequent breakfast consumption. This finding was higher in comparison with previous studies. The study conducted among Adolescents in public secondary schools in Kwara state showed that 23% skipped breakfast (Lateef et al., 2016), 14.1% of adolescents skipped breakfast in a study conducted by Omuemu and Oko-Oboh, (2015), 31.5% of adolescents skipped breakfast in a study conducted by Priya, Theresa, Carol, Debra, John and Susan, (2010), the prevalence of breakfast skipping among children and adolescents in the Netherlands was 19.1% (Lieke, Raaijmakers, Kathelijne, Bessems, Stef, Kremers and Patricia van Assema, 2009), similar study conducted in Croatia by Irena and Zvonimir (2008) showed that 1.7% skipped breakfast meal. 43.6% prevalence of breakfast skippers among adolescents aged 12–15 years in Rotterdam schools (Dejong, van Lenthe and van der Horst, 2009), while it was 14% among adolescents in UK school children (Hoyland et al., 2012).

Previous studies that linked meals skipping to concern about body image among adolescent girls (Sjoberg et al., 2003; Calderon, Yu and Jambazian, 2004; Chin and Mohd Nasir, 2009; Onyiriuka, Umoru, Ibeawuchi, 2013).

However, breakfast skipping was related to gender with females skipping more than three times as often as males (Shaw, 1998), which is in contrast with the findings from this study which found the relationship between breakfast consumption pattern and gender of respondents was not statistically significant with P =0.957. A study by Ma et al., (2003) found that adults and adolescents who skipped breakfast tend to eat more for the rest of the day.

Evidence also suggests that adolescents were more likely to eat a substantial breakfast during holidays than during school days (Ortega, Requejo, Lopez-Sobaler, Andres, Quintas, Navia and Rivas, 1998) which is consistent with the findings of this study. A greater proportion (33.8%) of the respondents skipped breakfast during school days.

Ready-to-eat cereal was the most commonly consumed breakfast food, followed by fruits and vegetables, bread and tea, oatmeal, pap and bean cake/moi moi, rice and stew, sphagetti with fewer students eating cooked breakfast and plantain with egg. This finding was consistent with previous studies. A results from a systematic review where it was found that ready-to-eat cereals and dairy foods were the most commonly consumed breakfast items, followed by fruit and fruit juice, and bread products (Mullan and Singh, 2010), recent summary of nine studies involving both adults and children found that people who eat breakfast cereals regularly tend to have a lower body mass index (BMI) and are less likely to be overweight than those who do not eat breakfast cereals frequently (De la Hunty and Ashwell, 2007). It has been suggested that consuming a breakfast that includes cereal is beneficial to overall nutrient intake, as some cereals are indeed low in fat, good sources of complex carbohydrates, fortified with essential nutrients, and high in dietary fibre (Barton et al., 2005). In contrast, there are concerns about the nutritional quality of other ready-to-eat cereals based on their high sugar content and lack of nutrients (Nicklas et al. 2002). Studies show that consumption of vegetables and fruits are unsatisfactory among college or university students (Debate, Topping and Sargent, 2001; Osako *et al.*, 2005), which is comparable with the findings of this study. Glanz and Holscher, (2004) found that a changing environment, policy and pricing did manage to result in moderate improvement on the consumption of fruits and vegetables.

5.5. Factors influencing breakfast consumption pattern of the respondents

5.5.1. Factors that influence breakfast consumption of the respondents

Some of the factors revealed from this study that influences breakfast consumption of respondents includes health reasons, academic performance, peer pressure, energy, improved mood, alertness, knowledge on the benefits of consuming breakfast, knowledge on health effects associated with skipping of breakfast. According to International Food Information Foundation Council (2009) and (Neill, Dinero and Allensworth, 1997), peer pressure has an impact on adolescents decision of consuming breakfast and types of food to be consumed because that is the time they want to gain peer acceptance or insist on independence from parental authority. Peer pressure can therefore, be an important determinant in breakfast consumption which was consistent with the findings from this study.

5.5.2. Factors that discourage breakfast consumption of the respondents

Factors that discourage breakfast consumption of the respondents were not different from what other studies reported which were more of personal choice such as busy schedule, do not like the food serves as breakfast, insufficient time to eat, parents refused to provide breakfast, parents do not consume breakfast before going to work, lack of appetite, to loose weight, it takes too much time to prepare, lack of knowledge on benefits of breakfast and lack of knowledge on the health effects associated with skipping of breakfast. This finding was in consistent with previous studies. Majority of the adolescents skip breakfast due to different reasons such as not liking the food served at breakfast, not being hungry in the morning, being on a diet to lose weight, insufficient time to eat, insufficient time to cook, lack of perceived parental emphasis on breakfast, lack of time, poverty, individual choice, not feeling good and loss of appetite (Rampersaud, Pereira, Girard, Adams and Metzl, 2005). Similar findings have been reported elsewhere (Chitra and Reddy, 2007). The major factors influencing pattern of breakfast consumption of the respondents was being on a diet to lose weight (46.8%), woke up late (51.2%), takes too much time to prepare (45.8%) which was consistent with an Australian study by Shaw, (1998) found that the factors influencing pattern of breakfast consumption were almost exclusively lack of time and not being hungry in the morning.

Many people think that skipping breakfast will help them lose weight but studies consistently show that those who eat breakfast are less likely to be overweight or obese (Siega-Riz, Popkin and Carson, 1998; Bertrais, Luque, Preziosi, Fieux, De Flot, Galan and Hercberg, 2000; Sjoberg, Hallberg, Hoglund and Hulthen, 2003; De la Hunty and Ashwell, 2007), whereas those who eat breakfast tend to be leaner and more likely to maintain weight over time (Gibson and O'Sullivan, 1995). Eating breakfast may help prevent weight gain, according to findings from the Health Professionals Follow-up Study (Van der Heijden, Hu, Rimm and van Dam, 2007).

5.6. Nutritional status using Body Mass Index (BMI) of the respondents

Majority of the respondents 50.2% had a normal weight (18.50 – 24.99), while only few of the respondents 30.4%, 1.7% and 17.7% were overweight (> or =25.0), obese (> or =30.0) and underweight (<18.50) respectively. This finding was in consistent with previous study conducted by Lateef et al., (2016) among students in public secondary school in Kwara state, Nigeria which reported that majority 66% had a normal weight, while 4.7%, 29.1% and 0.2 were overweight, underweight and obese respectively. A wealth of data indicate that regular breakfast consumption has been associated with a healthier body mass index and reduced likelihood of obesity development in adults and children alike (de la Hunty and Ashwell, 2007; Szajewska and Ruszczynski, 2010), it may also be protective of weight gain over time (Ask et al., 2006; Albertson et al., 2007). This is consistent with the findings from this study which found the relationship between breakfast consumption pattern and nutritional status among the respondent is statistically significant with P=<0.001 and in contrast with the finding conducted by Lateef et al., (2016) which shows that there is no significant relationship between food consumption pattern and nutritional status.

According to (Barton et al., 2005; Berkey, Rockett, Gillman, Field and Colditz, 2003; Haines, Guilkey and Popkin, 2007 Rampersaud et al., 2005; Siega-Riz et al., 1998; Stockman, 2005 and Timlin and Pereira, 2008), adolescents who skip breakfast have higher BMIs than those who consume breakfast. Skipping breakfast is commonly observed in overweight or obese adolescents (Siega-Riz et al., 1998).

5.7. Suggestions for improving Breakfast Consumption in Secondary schools

3 suggestions were made by the respondents. Greater proportion of the respondents 42.2% did not respond to the question on suggestions while few of the respondents 14.7%, 28.4% and 14.7% suggested " School breakfast programme should be organized by schools, public enlightments on the health effects associated with skipping breakfast and students should be educated on the benefits of consuming breakfast". This finding shows that majority of the students were able to provide possible solutions to encourage breakfast consumption.

5.8. Implication of the study findings for health promotion and education

The findings of this study have accomplishment for planning, implementation and evaluation of health education strategic programmes on breakfast consumption pattern targeted among adolescents. Health promotion is the process that enables people to improve or have a greater control over their own health and its aim is to help an individual or group reach a state of complete physical, mental, social well being and makes it possible for people to increase control over the determinants of health and thereby improve their health while health education is a combination of learning experience designed to facilitate voluntary adaptation of behavior which is of benefits to health. It is concerned with reinforcing and changing knowledge, attitude and behavior of people through effective communication of fact based information, with the aim of helping them to ensure an optimum well being.

The respondents had good knowledge and perception of the health benefits of breakfast consumption, yet many skipped breakfast or had infrequent breakfast consumption. Different factors that discouraged adolescents from consuming breakfast has been identified in this study. Majority of the students who skipped breakfast or had infrequent breakfast consumption reported that major factors that discourage them from consuming breakfast were that of availability of time to eat/busy schedules, lack of appetite, wake up late and to loose weight. Health promotion and education strategies such as advocacy, public enlightenment and training can be used to tackle some of these challenges identified in this study.

Advocacy

This is a health education intervention/strategy which involves championing the course of something or an action. It is often aimed at defending a group of people or improvement of their status (Obar, Zube and Lampe, 2012). It could be done through methods such as media advocacy and lobbying by interest group. The aim is to guide policy-makers at national and sub-national levels in the development and implementation of policies that will encourage healthy eating particularly regular breakfast consumption in the school setting, as well as to recommend changes in the school food environment by providing a suitable and convenient cafeteria for breakfast as well as a suitable time table so as to provide adequate time for students to consume breakfast. For example, organizing a school breakfast programme which must meet the applicable recommendations of the Dietary Guidelines for Americans. That is, breakfasts must provide one-fourth of the Recommended Dietary Allowance for calories, protein, calcium, iron, vitamin A, and vitamin C. Each schools should decide on what food to prepare and serve based on these requirements (United States Department of Agriculture: Food and Nutrition Service, 2008), the guide will also recommend the inclusion of nutrition and health education programs which should be carried out periodically in the various basic schools in the metropolis and this should be in cooperated into the educational curricula in the long round, as a means of providing knowledge about the benefits and implications of skipping breakfast such as excess weight gain; addressing the suggestion that principals of each school should ensure student consume breakfast before commencing daily activities; addressing the safe preparation of breakfast and its consumption as an essential positive and enjoyable aspect of life; and involving the Ministry of health to carry out educative programs for parents on the need for good nutrition in adolescence and also encourage variability in diets and consumption of animal protein so as to boost their appetite since parents have major influence on food choices

Public enlightenment

Public enlightenment is an organised communication activity with the aim of creating awareness and changing behaviour among the general population which are often characterised as mass media campaigns.

Mass media campaigns is recommended as one of the "Best Buys" for Non Communicable Diseases prevention and control, it also involve the provision of information to the general public through a variety of other channels, including: Health and education-related settings; Public relations events, such as talks, demonstrations and tours; Social media and Mass media (World Health Organisation, 2011).

Information, Education and Communication (IEC) materials can be used to address the high breakfast skipping or infrequent breakfast consumption among students and to get the students familiar with the benefits of breakfast consumption and health implications of skipping breakfast since information and communication is very essential for behavioural change in health promotion. This can be achieved by the Government, Ministry of health and education and Non Governmental Organisations in collaboration with the principal and teachers of each school. Messages such as "skipping breakfast result to excess weight gain"; "Breakfast consumption improves academic performance", Students who eat breakfast make better food choices during the day" will be displayed on the IEC material so as to promote regular breakfast consumption which should be addressed to both students and their parents. This can be done with supervision from a health promotion expert vast in behavioral communication.

Training

Training is an educational process design to equip people with functional knowledge and skills, with the objective of enabling people to do things well. From the findings of this study, the respondents had good knowledge and perception of the health benefits of breakfast consumption; hence, training could be in form of continuing education, classes, for both teachers and students in the School to tackle the problem of breakfast skipping among Secondary School.

For example, During club and society activities in school, students should be educated on the benefits of consuming breakfast and health implications associated with skipping of breakfast such as Drama club organizing dramas to educate on prompt breakfast consumption, Debate clubs by organizing debates on consuming breakfast and skipping breakfast, Jet clubs by organizing a talk on nutritional values on breakfast foods, Art club by creating a posters, drawings on benefits of breakfast consumption. This will require the invitation of lecturers/specialists in Public Health Nutrition or someone that is vast in that area to facilitate such program. The evaluation methods that will ensure that the objectives are met are pre and post tests as well as question and answer.

5.9. Conclusion

This study has shown that the respondents knowledge on breakfast consumption and perception of the health benefits of breakfast consumption was high, and a contributing factor could be that the study population was made up of in-school adolescents presently within an academic settings. In spite of these good knowledge and perception, majority of the respondents skipped breakfast or had infrequent breakfast consumption.

The major factors that influences breakfast consumption of respondents includes health reasons, academic performance, peer pressure, energy, improved mood, alertness, knowledge on the benefits of consuming breakfast, knowledge on health effects associated with skipping of breakfast. However, major factors that discourage the respondents from consuming breakfast was that of availability of time to eat/busy schedule, being on a diet to lose weight, do not like to eat early, do not like the food served as breakfast, not feeling good, lack of appetite while less common factors include parents not providing breakfast and not consuming breakfast before going to work.

The result of this study shows that there is a significant relationship between breakfast consumption pattern and nutritional status of the respondents, no significant relationship between the level of knowledge of the perceived health benefits of breakfast consumption and pattern of breakfast consumption, no significant relationship between breakfast consumption pattern and family structure. Lastly, there was no significant relationship between breakfast consumption pattern and gender.

5.10. Recommendations

In light of these findings, recommendations were made, which could be adopted and utilized by appropriate stakeholders.

a. School breakfast programme should be organized in schools which must meet the applicable recommendations of the Dietary Guidelines for Americans. Breakfasts must provide one-fourth of the Recommended Dietary Allowance for calories, protein, calcium, iron, vitamin A, and vitamin C. Each schools should decide on what food to prepare and serve based on these requirements (United States Department of Agriculture: Food and Nutrition Service, 2008).
b. The Ministry of Health should carry out educative programs for parents on the need for good nutrition in adolescence and also encourage variability in diets and consumption of animal protein since parents have major influence on food choices.
c. Nutrition and health education programs should be carried out periodically in the various basic schools in the metropolis and this should be in cooperated into the educational curricula in the long round.
d. All pupils should be encouraged to take part in Physical Education (PE) classes to involve all pupils in physical activity at least once in a week.
e. Policies on breakfast consumption should be made so as to encourage parents to provide breakfast for their wards.
f. During Parent Teachers Association meeting, issues related to breakfast should be discussed so that parents will be aware of the importance and health effects associated with skipping of breakfast.
g. Seminars on the importance of providing a nutritious breakfast should be organized in schools and parents of each ward should be invited.
h. Parents should serve as a role-model to their children by consuming breakfast before leaving for work and also providing a well packaged and nutritious food for their children to school.
i. Charts on the importance of breakfast and the types of food to be consumed as breakfast should be displayed in classrooms.

j. Teachers should encourage student on breakfast consumption before leaving the school premises to their various homes.

k. Letters or circular containing types of food to be consumed as breakfast and its importance should be sent to the parents via their wards.

l. Adolescents should be educated on weight-conscious most especially the female ones who believe skipping breakfast is an effective weight management strategy and that eating a healthful breakfast may aid weight management efforts.

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APPENDIX 1

QUESTIONNAIRE

TOPIC: BREAKFAST CONSUMPTION PATTERN AND NUTRITIONAL STATUS AMONG IN-SCHOOL ADOLESCENTS IN IBADAN NORTH LOCAL GOVERNMENT AREA, OYO STATE. NIGERIA

INTRODUCTION: Greetings, I am a student of the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan. I am conducting a study on Breakfast Consumption pattern and nutritional status among in-school adolescents in Ibadan North Local Government Area and would very much appreciate your participation. I will be grateful if you spend some time answering these questions, promise not to take much of your time. All the information provided will be kept confidential. You are not obliged to answer any question you do not wish to answer. Thanks.

Questionnaire Identification Number: _____

Date of Interview: _____

Would you like to participate? Yes [ ] No [ ]

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS

Instruction: Please tick [/] ***in the boxes provided (as appropriate)***

1. Gender 1. Male [ ] 2. Female [ ]
2. Age at last birthday? _____ (in years)
3. Name of school : _____
4. Class: 1. SSS 1 [ ] 2. SSS 2 [ ] 3. SSS 3 [ ]
5. Religion: 1. Christianity [ ] 2. Islam [ ] 3. Traditional religion [ ]
   4. Others (specify) _____
6. Ethnic group: 1. Yoruba [ ] 2. Hausa [ ] 3. Igbo [ ] 4. Others (specify) _____
7. Family structure: 1. Monogamous [ ] 2. Polygamous [ ]
8. Mothers occupation? _____

9. Fathers occupation? _____

10. Who are you living with?
    1. Both parents [ ] 2. Mother alone [ ] 3. Father alone [ ] 4. Siblings [ ]
    5. Relatives [ ] 6. Guardian [ ] 7. Others (specify) _____
11. Do you have a house-help? 1. Yes [ ] 2. No [ ]

SECTION B: KNOWLEDGE OF BREAKFAST CONSUMPTION AND ITS PERCEIVED HEALTH BENEFITS

S/N	QUESTIONS	OPTIONS AND ALLOTTED POINTS	Official Use
12.	What is Breakfast?	I. Breakfast is the first meal of the day [ ] II. Breakfast is the first meal of the day eaten before 10 am in the morning [ ] III. Breakfast is the food eaten to break a fast [ ] IV. I don't know [ ]	
13.	List 2 types of food that are suitable for breakfast	_____ _____	
14.	Mention 2 benefits of consuming breakfast	_____ _____	
15.	Mention 2 health effects associated with not eating of breakfast	_____ _____	

16. Total score obtained …….

17. Code …….

SECTION C: PERCEPTION ON BREAKFAST CONSUMPTION AND ITS HEALTH BENEFITS

Instruction: Please read the statements below and tick [/] ***appropriately***

	Perception Statement	Answers	Official Use
18	Eating breakfast helps me do better in school	1. Yes [ ] 2. No [ ]	
19	I think my daily activities are not affected by breakfast	1. Yes [ ] 2. No [ ]	
20	I tend to be more active when I eat breakfast	1. Yes [ ] 2. No [ ]	
21	I consider myself not fully alert until I have had breakfast	1. Yes [ ] 2. No [ ]	

22	Students who eat breakfast make better food choices during the day	1. Yes [ ] 2. No [ ]	
23	I do not think breakfast is important for cognitive function and academic performance	1. Yes [ ] 2. No [ ]	
24	Missing breakfast makes me consume more during lunch	1. Yes [ ] 2. No [ ]	
25	Breakfast improves my mood	1. Yes [ ] 2. No [ ]	
26	I think after eating breakfast I feel sluggish	1. Yes [ ] 2. No [ ]	
27	I do not consider myself at any risk of chronic diseases later in life whenever I miss breakfast	1. Yes [ ] 2. No [ ]	
28	I think eating breakfast makes me add weight	1. Yes [ ] 2. No [ ]	

29. Total score obtained ……

30. Code ……..

SECTION D: BREAKFAST CONSUMPTION PATTERN

Instruction: Please tick [/] ***in the boxes provided (as appropriate)***

31. Do you eat breakfast? 1. Yes always [ ] 2. Yes sometimes [ ] 3. Never [ ]

32. If Yes always or Yes sometimes, how often do you eat breakfast in a week?

1. Never [ ]
2. ≤ Two days a week [ ]
3. Three to five days a week [ ]
4. ≤ Six days a week [ ]
5. Everyday [ ]
6. Irregular [ ]

33. How often do you eat breakfast in a month?

1. Everyday [ ] 2. Irregular [ ] 3. Rarely [ ] 3. Never [ ]

34. Did you take your breakfast this morning? 1. Yes [ ] 2. No [ ]

35. What time do you normally take breakfast during school days?

1. 6am [ ] 2. 7am [ ] 3. 8am [ ] 4. I don't take breakfast during school days [ ]

36. What time do you normally take breakfast during the weekend?

1. Before 10am [ ] 2. After 10am [ ] 3. I miss breakfast during weekends [ ]

37. Have you ever missed breakfast before? 1. Yes [ ] 2. No [ ]

38. How often do you miss breakfast in a week?

1. Never [ ]
2. ≤ Two days a week [ ]
3. Three to five days a week [ ]
4. ≤ Six days a week[ ]
5. Everyday [ ]
6. Irregular [ ]

39. When do you miss breakfast the most?

1. School days [ ] 2. Saturdays [ ] 3. Sundays [ ] 4. I don't miss breakfast [ ]

40. Total score obtained …….

41. Code ……..

Please kindly tick [/] ***appropriately***

	How often do you eat the following during breakfast?	**1-2 times**	**3-4 times**	**5-6 times**	**Everyday of the week**	**Never**
42.	Ready-to-eat Cereals (cornflakes, Golden morn, etc.)					
43.	Bread and tea/beans					
44.	Cooked Breakfast (noodles, egg, etc.)					
45.	Pap and bean cake/ moi-moi					
46.	Plantain and egg					
47.	Rice and stew					
48.	Sphagetti					
49.	Fruits/Vegetables					
50.	Oatmeal					
51.	Others (specify) …….					

SECTION E: FACTORS INFLUENCING BREAKFAST CONSUMPTION PATTERN

Instruction: Please read the statements below and tick [/] ***the most appropriate factors on either the one that influences you to take breakfast (if you eat breakfast always) or discourages you from taking breakfast (if you don't eat breakfast at all) or select from the two factors if you eat and miss breakfast sometimes.***

FACTORS THAT INFLUENCE YOU TO TAKE BREAKFAST

	Factors (You can tick more than one that applies to you)	**Yes**	**No**	**Don't Know**
52.	To boost my academic performance			
53.	Health Reason (Ulcer)			
54.	My friends eat breakfast everyday before coming to school			
55.	To gain energy			
56.	To improve my mood			

57.	To be alert			
58.	knowledge on benefits of breakfast consumption			
59.	knowledge on the health effects associated with not eating of breakfast			
60.	Other reasons (specify) …….			

FACTORS THAT DISCOURAGE YOU FROM TAKING BREAKFAST

	Factors (You can tick more than one that applies to you)	**Yes**	**No**	**Don't Know**
61.	Busy Schedule (No time to eat)			
62.	Do not like the food served as breakfast			
63.	Insufficient time to eat			
64.	My parents refuse to provide breakfast			
65.	My parents do not eat breakfast before going to work			
66.	Lack of appetite			
67.	To lose weight			
68.	I wake up late			
69.	It takes too much time to prepare			
70.	Lack of knowledge of the benefits of breakfast consumption			
71.	Lack of knowledge on the health effects associated with not eating of breakfast			
72.	Other reasons (specify) …….			

SECTION F: NUTRITIONAL STATUS USING BODY MASS INDEX (BMI)

73.	Weight of student (kg)		
74.	Height of student (m)		
75.	BMI of student (kg/m^2)		

SUGGESTIONS

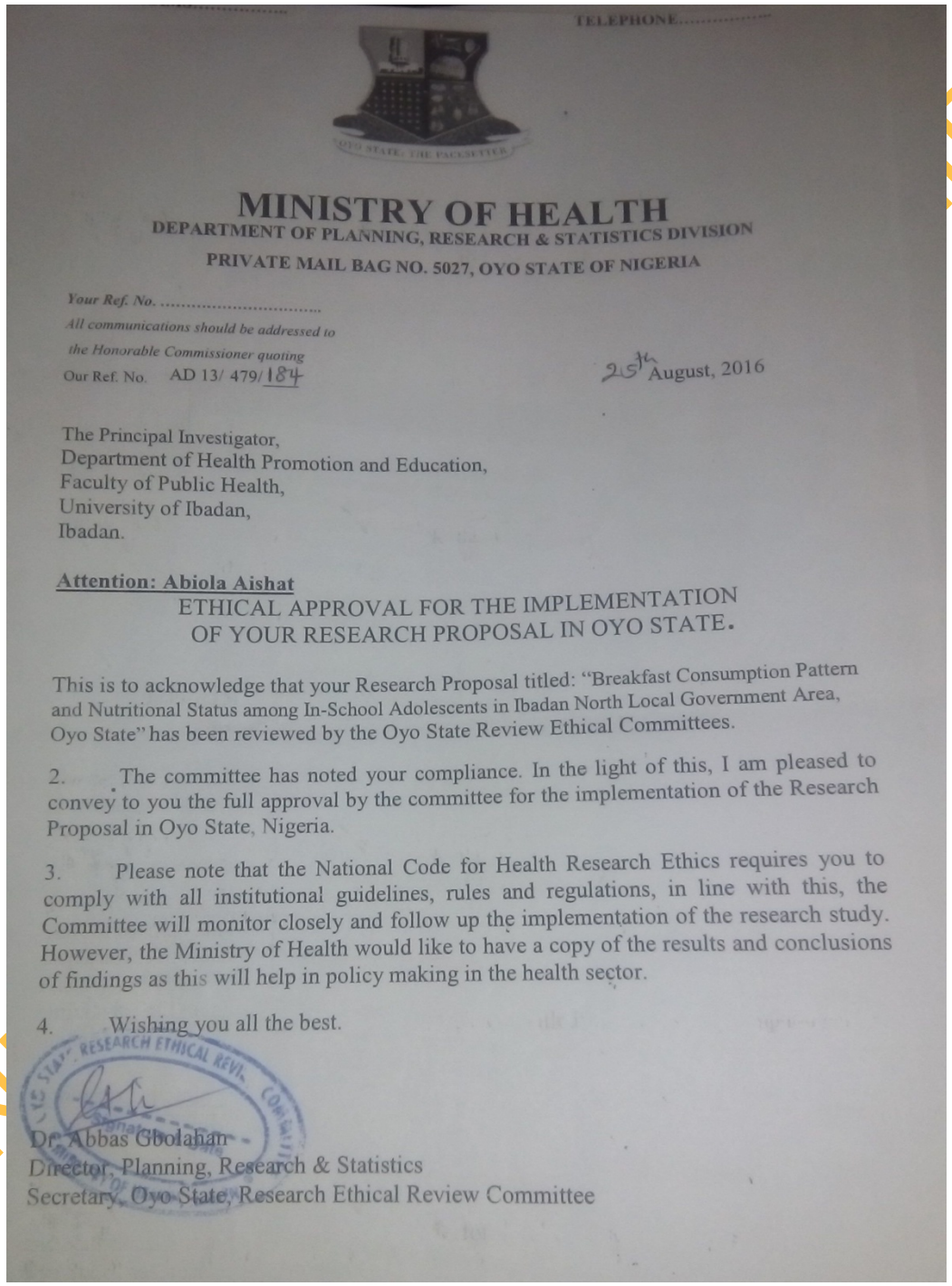
List two ways you feel breakfast consumption can be promoted in schools

1. …….
2. …….

Thank you for your participation

APPENDIX 2

ETHICAL APPROVAL



TELEPHONE.....

OYO STATE: THE PACESETTER

MINISTRY OF HEALTH
DEPARTMENT OF PLANNING, RESEARCH & STATISTICS DIVISION
PRIVATE MAIL BAG NO. 5027, OYO STATE OF NIGERIA

Your Ref. No. .....
All communications should be addressed to the Honorable Commissioner quoting
Our Ref. No. AD 13/ 479/184

25th August, 2016

The Principal Investigator,
Department of Health Promotion and Education,
Faculty of Public Health,
University of Ibadan,
Ibadan.

Attention: Abiola Aishat

ETHICAL APPROVAL FOR THE IMPLEMENTATION OF YOUR RESEARCH PROPOSAL IN OYO STATE.

This is to acknowledge that your Research Proposal titled: "Breakfast Consumption Pattern and Nutritional Status among In-School Adolescents in Ibadan North Local Government Area, Oyo State" has been reviewed by the Oyo State Review Ethical Committees.

2. The committee has noted your compliance. In the light of this, I am pleased to convey to you the full approval by the committee for the implementation of the Research Proposal in Oyo State, Nigeria.

3. Please note that the National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations, in line with this, the Committee will monitor closely and follow up the implementation of the research study. However, the Ministry of Health would like to have a copy of the results and conclusions of findings as this will help in policy making in the health sector.

4. Wishing you all the best.

Dr. Abbas Gbolahan
Director, Planning, Research & Statistics
Secretary, Oyo State, Research Ethical Review Committee

APPENDIX 3

MAP OF IBADAN NORTH