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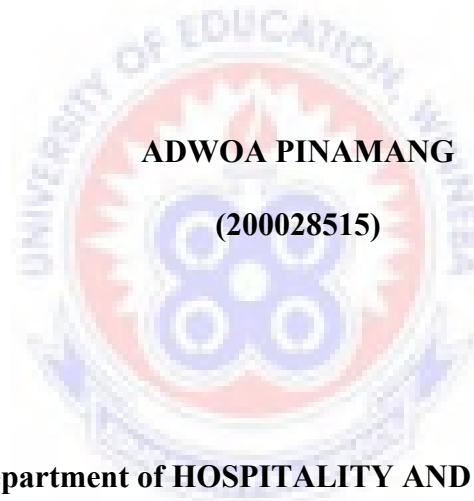
**EXPLORING THE LINKAGE BETWEEN BREAKFAST INTAKE AND  
STUDENT'S ACADEMIC PERFORMANCE: EVIDENCE FROM SOME  
SECOND CYCLE SCHOOLS WITHIN THE ASHANTI REGION**





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**A Thesis in the Department of HOSPITALITY AND TOURISM EDUCATION,  
Faculty of VOCATIONAL STUDIES EDUCATION, submitted to the School of  
Graduate Studies, University of Education, Winneba, in Partial fulfillment of the  
requirements for the award of Master of Philosophy  
(Catering and Hospitality) degree**

**NOVEMBER, 2020**

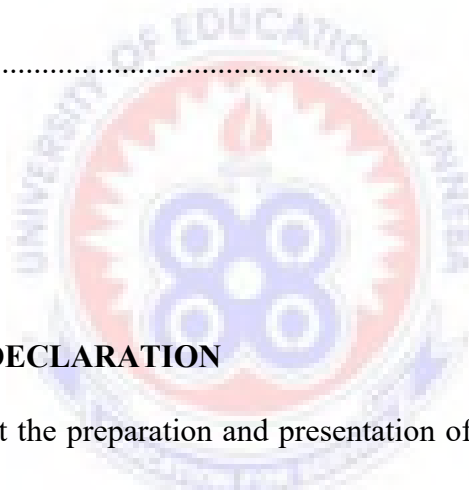
## DECLARATION

### STUDENT'S DECLARATION

I, **Adwoa Pinamang**, declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

SIGNATURE: .....

DATE: .....



### SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of this thesis as laid down by the University of Education, Winneba.

NAME: **DR. MRS. ELLEN LOUISE OLU FAGBEMI**

SIGNATURE: .....

DATE: .....

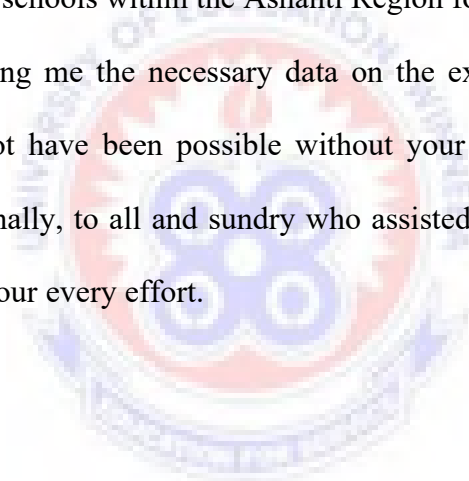
## **DEDICATION**

This work is dedicated to my children, Aseda Konadu Frimpong and Adwoa Nyarko Frimpong.



## ACKNOWLEDGEMENTS

I give all the glory to God the giver of wisdom and knowledge and the source of my strength for granting me the mental and physical endurance throughout my entire course and research work. Again, I am most grateful to Dr. Mrs. Ellen Louise Olu Fagbemi for her insight and guidance throughout this work, may the Most-High God graciously bless you. Also, I extend my profound appreciation to all the faculty members (Faculty of Business Administration) for their stimulating thoughts and the intense training I acquired through their tutelage, I say “Ayekoo”, and God richly bless them you all. Again, I also wish to express my appreciation to all heads of the selected senior high schools within the Ashanti Region for allowing me access to their schools and providing me the necessary data on the exams score of their students. This work could not have been possible without your tremendous assistance, God richly bless you. Finally, to all and sundry who assisted this work in one way or the other, I appreciate your every effort.



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## ABSTRACT

Although, healthy dietary practices have been identified as very important predictor of children and adolescent's development however, what continues to remain a puzzle in this discussion is how the continuous consumption of healthy breakfast contributes to student academic performance. This study investigated how breakfast intake influence student's academic performance at the secondary school level. Specifically, the main objectives of the study were; to examine breakfast consumption habits of Ghanaian second cycle school students, to investigate the specific factors that lead to student's breakfast skipping behaviours, to explore how the consumption of breakfast affect students' academic performance and lastly to compare student's academic achievement between breakfast skippers and breakfast takers. The study population came from all the second cycle schools within the Ashanti Region hence, 50 of these schools within the region were targeted. The study employed a cross-sectional design hence, distributed questionnaire to collect specific information on the students' breakfast consumption patterns. Again, the academic scores of the respondents on all the core subjects; core mathematics, English language, social studies and integrated science were used as the proxy to assess the sample academic performance. The study employed SPSS tool to analyse the study data on the basis of descriptive (i.e. frequency and percentages) and inferential analysis (probit regression analysis). Results from the study revealed that taking breakfast did not only improve the participants exams score in all the core subjects; core mathematics, English language, social studies and integrated science but it equally reduce the failing rate of breakfast takers. Again, it was established that most of the respondents skipped their breakfast mainly because they dislike most of the meals served to them as breakfast. Since, taking breakfast on a regular basis has been found to have a positive influence on

students' academic performance, it equally becomes prudent to have a variety in the meals served to the students or if possible take feedback from the students with regards to the meals they will prefer to be served to them as their breakfast since this approach can in any way increase the students intake of breakfast.

**KEYWORDS:** breakfast, breakfast takers, skippers, academic performance, senior high schools, Ashanti Region.



## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the Study

Breakfast is the first meal taking during the early part of the day and it is identified as the main source of nutritional value for both children and adolescents (Cooper, Bandelow, & Nevill, 2011). Conceptually, breakfast is described as the cluster of meal consumed first in the day prior to the commencement of daily activities and it often constitutes close to 20%-30% of all daily energy needs (Zilberter & Zilberter, 2014). According to the US Department of Agriculture, a breakfast meal should contribute to at least 10% of the recommended dietary allowance (RDA) for energy and should be made up of foods from at least two of the following food groups namely; grains, low fat dairy products, fruits, vegetables, lean meats, and finally nuts, seeds, and legumes (Hasz & Lamport, 2012).

Breakfast intake has been associated with a number of positive health outcomes namely; giving the individual a more favorable dietary profile (Adolphus, Lawton, & Dye, 2013), maintenance of good body mass index (BMI) (Szajewska & Ruszczynski, 2010), increasing the physical activity behaviour of the individual (Sandercock, Voss, & Dye, 2010), regulating the individual appetite (Astbury, Taylor, & Macdonald, 2011), and improving the metabolism rate of the individual (Mamerow, 2014). Again, it has been established that taking breakfast regularly increases students' presence at school and consequentially decreases students' rate of absenteeism (Food Channel, 2011). It has also been identified to improve students' mental and cognitive abilities. For instance, Adolphus, Lawton, Champ and Dye (2016) and Iovino et al. (2016)

observed that taking breakfast regularly tends to have a meaningful effect on the cognitive performance of a child particularly in the areas of attention, memory, problem solving, and logical reasoning. More so, other positive outcomes such as, enthusiasm, interest, energy level, mental alertness, joy and willpower have all been found to increase significantly among regular breakfast eaters than in non-breakfast eaters (Gardner, Wansink, Kim, & Park, 2014).

According to Wilson, Parnell, Wohlers and Shirley (2006), children who failed to take breakfast in a day have significantly worse daily nutrient intakes hence, resulting into higher intake of total fat, and lower intakes of dietary fibre and micronutrients than those who eat breakfast every day. Again, hungry children have been found to lack the required energy and motivation to become active participants in class activities with malnutrition and micronutrient deficiencies having shown to affect the physical, mental, and social health of children and consequently reduce their cognitive functioning abilities (Mhurchu, et al., 2010).

Hence, in an attempt to make nutritional diet available to school children, many governments particularly in countries like the United States, United Kingdom, Sweden, Ghana, Uganda, Kenya, etc. have all in one way or the other funded varied forms of school feeding program with its sole aim to provide a free healthy breakfast to school going children in public schools (Vermeersch & Kremer, 2004; Ghana School Feeding Programme, 2006; Defeyter, Graham, Walton, & Apicella, 2010; Acham, Kikafunda, Malde, Oldewage-Theron, & Egal, 2012). For instance, in the case of Ghana, the government effort to improve students' school enrolment and academic performance resulted into the implementation of several educational



programs such as, the Free Compulsory Universal Basic Education (FCUBE), capitation grant, school feeding programme (SFP), the Free Senior High School Policy, etc. Particularly, when it comes to the SFP, its sole objective was to give children in public primary schools and kindergartens mostly in the poorest areas of Ghana with one hot, nutritious meal per day, using locally-grown food stuffs (Ghana School Feeding Programme, 2006).

Although, healthy dietary practices have been identified as very important predictor of children and adolescent's development particularly it's contributing effect on their weight status, nutritional status and cognition development however, what continue to remain a puzzle in this discussion is how the continuous consumption of healthy breakfast contribute to academic performance (Taha & Rashed, 2017). According to Taha and Rashed (2017), fewer studies have looked into how breakfast consumption organically contributes to academic performance. Accordingly, it is against this backdrop that this study seeks to assess how its implementation at the targeted schools have impacted on the beneficiaries academic performance.

## **1.2 Problem Statement**

Generally, nutrition has shown to have wide effect on students' thinking skills, behaviour, and health conditions (Wilder Research, 2014). For instance, it has been observed that regularly taking foods that are rich in protein, carbohydrates, and glucose improve students' cognition, concentration, and energy levels (Bellisle, 2004; Sorhaindo & Feinstein, 2006) whereas taking foods that are high in trans and saturated fats adversely affect brain development and consequentially affect students learning outcomes and memory functionality (Gómez-Pinilla, 2008). Li and

O'Connell (2012) affirmed Gómez-Pinilla (2008) claim in their study as their results assert that 5th grade students who ate more fast food performed poorly on math and reading assessment test than students who did not. Hence, it has been argued that having access to quality nutrition particularly breakfast, do improve student's psychosocial well-being (Brown, Beardslee, & Prothrow-Stith, 2008). Extant works have shown that children and adolescents who often take breakfast have a higher intake of micronutrients and also have a lower body mass index (BMI) and reduced risk of becoming overweight or obese Szajewska & Ruszczyński, 2010; De La Hunty, Gibson, & Ashwell, 2013).

Even though some works have reported positive impact between breakfast intake and students academic performance (see for example, Gómez-Pinilla, 2008; Li & O'Connell, 2012; De La Hunty, et al., 2013) yet, it is not in all instances that such positive impact has been established. For instance, in the study of Turki, Shloi, Harbi, Agil and Othman (2019) no statistically significant relationship was established between breakfast takers and skippers academic performance. Likewise, in the study of Valladares et al. (2016) no significant association was established between male consumption patterns of breakfast and their academic performance hence, called more studies in other context to determine the factors that could have accounted for such insignificant connection. Similarly, in the study of Corcoran, Elbel and Schwartz (2015), it was observed that even though the intake of government sponsored breakfast seems to have increased breakfast consumption among students yet the increased in breakfast consumption did not result in any gains in the students academic performanc. This goes to suggest that studies examining the impact of breakfast intake on students academic outcomes have produced ambivalent results (Mhurchu, et al., 2010).

Notwithstanding the conflicting results about the connection between breakfast intake and students academic performance, most of the extant works in this area have predominantly focus on advanced economies (Mahoney, Taylor, Kanarek, & Samuel, 2005; Cooper, Bandelow, & Nevill, 2011; Mohd, et al., 2012; Ral, Heo, Whiteford, & Faith, 2012; Defeyter & Russo, 2011); Corcoran et al., 2015) with little or no emphasis to developing economies.

Moreover, in the case of Ghana, the only study that seems to have looked into the impact of breakfast was the study of Ackuaku-Dogbe and Abaidoo (2014). Even with this study its emphasis was to explore the level of breakfast skipping among medical students and consequently assess its effect on their attention span and level of fatigue during clinical sessions. Even though, Ackuaku-Dogbe and Abaidoo (2014) looked at one of the dimension of this work that is how breakfast skipping affected the respondents attention span and level of fatigue, yet it still failed to look at how breakfast intake affected the respondent's academic performance. Hence, their study result cannot be relied on to confirm the connection between breakfast intake and student academic performance within the Ghanaian context. According to Intiful and Lartey (2014), studies about breakfast habit and impact among Ghanaian children are virtually non-existent hence, called for the need for more studies to be carried out in this area. As rightly indicated by Gans-Lartey (2017) the long-standing connection between nutrition and academic performance must be thoroughly explored particularly in Ghana in order to understand how breakfast intake at school contribute to student's academic performance and cognitive functioning. Accordingly, this study seeks to add more breadth to the literature by exploring how breakfast intake influence students' academic performance.

### **1.3 Aim of the Study**

The aim of the study is to investigate the influence of breakfast intake on student's academic performance at the secondary school level.

### **1.4 Objectives of the Study**

The study seeks to achieve the following specific objectives.

1. To examine breakfast consumption habits of Ghanaian second cycle school students.
2. To investigate the specific factors that lead to student's breakfast skipping behaviours.
3. To explore how the consumption of breakfast affect students' academic performance.
4. To compare student's academic achievement between breakfast skippers and breakfast takers.

### **1.5 Research Questions**

The major research questions to enable the researcher achieve the objectives of the study are outlined as follows:

1. What is the breakfast consumption habit of Ghanaian second cycle school students?
2. What are the specific factors that lead to student's breakfast skipping behaviours?
3. What is the relationship between breakfast consumption and students' academic performance?
4. What is the difference in academic achievement between breakfast takers and breakfast skippers?

### **1.6 Significance of the Study**

Findings from this study will contribute to both theoretical and managerial perspectives. From the theoretical standpoint, the results gained from will bring to bear how the composition of meals taking in the morning contributes to students' academic performance. Again, through this study findings, policy holders particularly those within the education sector will know whether the provision of free meal at school has any significant impact on the beneficiary academic performance or classroom attendance. Theoretically, as no study of such sort have been undertaken in Ghana to explore the relationship between breakfast intake and academic performance, findings from this study will add new breadth to the existing literature with regards to how breakfast intake in lower-middle income country like Ghana impact on free school attendance, achievement, psychosocial function, and nutrition. It will also serve as a resource material to stakeholders, that is, school authorities, civil society organizations and others for referencing in the recommendations provided. Finally, it will serve as a springboard to the academic community particularly with regards to those who may be willing to conduct further or related study into this field.

### **1.7 Scope of the Study**

This study is delimited in examining breakfast intake and students' academic performance among second cycle schools within the Ashanti Region.

### **1.8 Limitation of the Study**

The study sample would only come from second cycle schools within the Ashanti Region. This means that its results may not be exhaustive in covering other schools particularly those within the basic schools and tertiary schools. Again, since the study emphasis is only on breakfast meal, it suggests that the study results may not be able to address all issues in nutrition-based assessment particularly when it comes lunch meal intake and student's performance. More so, the assessment of the students' breakfast intake patterns will be assessed from a self-report, this suggests that the responses given by the respondents may not truly depict or reflect their breakfast consumption pattern.

### **1.9 Organization of the Study**

This study will be structured into six chapters. Chapter One, will give background information of the work and sets the topic of the study in context. It presents the aims and objectives of the study and explains the structure of the dissertation. Chapter Two is literature review. This chapter captures a review of related literature conducted in the breakfast consumption impact taking into account its relevance to the research topic in question, whilst pointing out gaps in previous research which this study intends to fill. Chapter Three discusses research methodology. It focuses on the methodology to be used to arrive at the conclusions in the last chapter. Explanation and justification for the selection of methods used in analysis will be discussed focusing on their reliability, validity and effectiveness in realising the goals of the study. Chapter four will be on the results or the study findings. The outcome of the research will be presented here. Chapter five will discuss the results in relation to the literature reviewed in chapter two. Also, significant and novel findings will be

identified, interpreted and discussed. The discussion will highlight the major findings of the research and the inferences made from them in view of findings from related previous studies. The last chapter thus Chapter Six will be on the summary of findings, conclusions and recommendations. This section will itemize the major research findings and indicate how this research work will contribute to knowledge. This section will also include recommendations and any limitations of the study and will also include suggestions for future research work.



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter deals with earlier works that are linked to the study purpose. Specifically, the chapter is divided into seven main sections. The first section that is section 2.1 presents the definition of the main concept of the study. Hence, with this section, how the key concept will be defined in this study is presented as well the working definition of the study is equally presented. The subsequent section thus, section 2.2 presents theoretical reviews that are relevant to the study purpose and how they can be depended upon to explain breakfast consumption patterns as well as its influence academic performance and class attendance. The next section that is, section 2.3-2.6 dwell extensively on empirical review by taking into accounts the study specific objectives. The final section that is, section 2.7 presents the conceptual framework. Specifically, under the conceptual framework the key variables as well the study hypothesis is presented.

#### **2.1 Conceptual Review**

This section primarily seeks to presents the key concepts employed in this context. Also, at this section, how the concepts have been defined in the literature by other authors is presented and subsequently the definition that will be adopted as the working definition for this study is equally presented.

##### **2.1.1 Breakfast**

Conceptually, Zilberter and Zilberter (2014) described breakfast as the first meal consumed in the day prior to the commencement of daily activities and often provides close to 20%-30% of all daily energy needs. Hence, it constitutes the lighter foods that



is, oat, porridge, eggs, bread, bacon, sausages, etc. According to the US Department of Agriculture, a breakfast meal should contribute to at least 10% of the recommended dietary allowance (RDA) for energy and should be made up of foods from at least two of the following food groups namely; grains, low fat dairy products, fruits, vegetables, lean meats, and finally nuts, seeds, and legumes (Lauren, Hasz, Mark & Lamport, 2012).

Also, Khani and Soleimani (2011) described breakfast as the first meal taken in the day mostly between the hours of 6:00-9:00 am in the morning. According to Khani and Soleimani (2011), a meal can be categorized as breakfast when it is taken in the early hours of the day and also supply the individual close to 600-700 calories of energy. This goes to affirm the early suggestion given by the US Department of Agriculture that a breakfast meal should contribute to at least 10% of the recommended dietary allowance (RDA) for energy (Timlin & Pereira, 2007).

Similarly, Alavi, Jazayeri, Banaem, Afrooz and Behboodi (2000) described breakfast as the category of meal that are taken in the early hours of day and often made of meals such as, bread, milk, cheese, walnuts, butter, egg and natural fruit juices. Likewise, from their perspective, every breakfast taken should be able to supply or provide on average 20% of a child's daily energy requirement. Hence, from these descriptions, breakfast can be defined as the first meal taking during the early part of the day and it is found to be a main source of nutritional value for both children and adolescents (Cooper, Bandelow, & Nevill, 2011). This suggests that consuming breakfast can impact positively on child's health and mental well-being, since it is linked to higher overall diet quality, nutritional status, participation in physical

activities, minimized intake of snacks and larger meal size throughout the day and also minimized the risk of obesity (Tin, Ho, Mak, Wan, & Lam, 2011; Levin, Kirby, & Currie, 2012). Likewise, consuming breakfast has also been identified a child's mental well-being, absorption and cognitive prowess (Adolphus, Lawton Champ & Dye, 2016; Iovino et al., 2016).

Theoretically, reasons given to breakfast impact on child health and mental well being have been attributed to several reasonings. For instance, breakfast intake has been identified to induced certain nutritional benefits. Specifically, studies done across several contexts suggest that breakfast consumers tend to have higher intake of fiber, vitamins (e.g., vitamin C, D, folic acid, and B12) and minerals (calcium and iron) (Pereira et al., 2011; Coulthard et al., 2017; Barr et al., 2014). Also, other works have revealed that taking meal in the early hours of the day increases the glucose level of the individual which consequently improved their cognition functioning ability (Feldman & Barshi, 2007). Again, breakfast skippers tend to have low level of blood glucose (i.e. hypoglycemia) than breakfast takers (Perlmutter, et al., 2008). According to Perlmutter et al. (2008), hypoglycemia conditions trigger uneasiness, fatigue, confusion, and slowed mental functions hence, affecting their cognitive function and mental attentiveness (Perlmutter et al., 2008). This condition even becomes very serious in children as evidence suggests that brain glucose metabolism happens to be quite higher in children compared to adults and that the metabolic rate of cerebral glucose utilization in children is almost twice as high as in adults (Chugani, 1998). Lastly, the average cerebral blood flow and cerebral oxygen usage tend to be higher in children than in adults (Aaslid, Huber, & Nornes, 1984; Adolphus, Lawton, Champ, & Dye, 2016). This supposes that children are more likely to exert a higher demand

on their glycogen stores, especially after the overnight fasting period, which is often longer during childhood than in adulthood (Turki et al., 2019). Accordingly, taking breakfast in the morning particularly by children may

### **2.1.2 Academic Performance**

According to Steinmayr, Meißner, Weidinger and Wirthwein (2017) since the field of academic performance happens to be wide and cover a wide range of educational outcomes, the description of academic performance happens to be dependent on the parameters used to measure it. For instance, some may choose to use measures such as the procedural and declarative knowledge learned in an educational system, or the curricular-based criteria such as grades or performance on an educational achievement test, or the cumulative indicators of academic achievement vis-à-vis educational degrees and certificates to define academic achievement or performance (Steinmayr et al., 2017). Even though, the measures for the assessment of academic performance tends to be diverse in scope nevertheless, what has to be realized is that all these criteria have one thing in common that is, they all seems to represent intellectual endeavours and for that matter depicts the intellectual ability of an individual (Steinmayr et al., 2017). Conceptually, Spinath (2012) defined academic achievement as the performance outcomes on intellectual domains learned either at a school, college, or university. Also, to Narad and Abdullah (2016) academic performance constitutes the knowledge acquired in school and are usually measured by the scores of the instructor or depicts the educational goals set by both the learner and instructor to be attained over an identifiable period of time. According to Narad and Abdullah (2016), these goals may be assessed through the use of a continuous assessment or examination scores. Yusuf, Onifade and Bello (2016) also viewed academic

achievement as an assessable and noticeable behaviour of a learner within a specific period. This assessable behaviour could take the form of the scores obtained by a learner on items such as class exercise, class test, mid-term exams, mock examination, or end of term exams.

According to Spinath (2012), the essence of academic performance can be observed from two different viewpoints that is, individual and societal perspective. Specifically, at the individual level, academic performance plays a pivotal role in a person's life as academic performance assessed by either WASSCE grade (West Africa Senior High School Certificate Exams), GPA (i.e. grade point average) or by standardized assessments such as the SAT (Scholastic Assessment Test) or TOEFL (i.e. Test of English as a Foreign Language) predicts whether a learner will have the opportunity to continue with his or her education at a higher learning institution or not (Steinmayr et al., 2017). Accordingly, academic achievement defines a person choice with regards to what course or program to study at a secondary or tertiary level and even at the latter stages of life predict the kind of job a person can pursue (Spinath, 2012). At the societal level, academic achievement becomes the dominant predictor of the society level of wealth and prosperity. For instance, the more educated a society is, the higher the likelihoods for a positive socioeconomical development (i.e. higher GDP growth health, lower unemployment rate, high saving rate, etc.) (Organization for Economic Co-Operation and Development, 2007). In this study, academic performance becomes the participants exams score on all the core subjects namely; Core Mathematics, English Language, General Science and Social Science will be used as the proxy to assess the participants academic performance. Hence, the West African Senior School Certificate Examination (2020) grading system of A1-F9 will

be used to evaluate the participants academic performance along all the selected core subjects.

## **2.2 Theoretical Review**

According to Kennedy, Davies, Ryan and Clegg (2017) the usage of theoretical frameworks in study seeks to achieve two key purposes. The first purpose of theoretical framework is to help a study know the main antecedents likely to influence an individual or group behaviour in a given context and secondly to help a study after identification of these factors model out specific interventions that can facilitate the group behavioural occurrence or reduce its occurrence within its natural setting. However, when it comes to the study of individual behaviour, intention and behavioural decisions several theories have developed or used in this regard. Notable among them are the Theory of Planned Behaviour (TPB; Ajzen, 2012), Social Cognitive Theory (SCT) (Bandura, 1991), Health Action Process Approach (HAPA) (Schwarzer, 2016), the Reasoned Action Approach (RAA) (Fishbein, Triandis, Kanfer, Becker, Middlestadt & Eichler, 2001), theory of food, etc. However, for purposes of this work, only few of these theories will be reviewed in this section.

### **2.2.1 Theory of Planned Behaviour (TPB)**

When it comes to a person nutritional or eating behaviour, one of the key theories used in this regard is the Theory of Planned Behaviour (TPB) (Ajzen, 2012). The TPB theory argued that the most significant determinant of person behaviour is his or her intention (Ajzen, 1991). Theoretically, an individual intention is shaped by three factors namely; attitude that is, the individual overall assessment of favourableness or unfavourableness of the consequences of a particular behavioural performance; subjective norm which is a person's perceptions of social pressure to perform or not to

perform a particular act; and perceived behavioural control (PBC) that is a person's perceptions of the ease or difficulty of performing a given behaviour (Ajzen, 1991).

Particularly, under attitude, it constitutes the psychological assessment of the consequence of a goal, by assigning a positive or negative value such as affection or hate, which is influenced by the difference between behavioural beliefs and the expectations of individuals (Ajzen, 1991). Meaning, it is the degree to which an individual has a favourable or unfavourable assessment of behaviour in question and is largely based on the degree to which this behaviour meets the person's motivations.

According to Jiang, Fang and Zhang (2015) there are generally three forms of motivation that influences a person's attitude; motivation for healthy behaviour, motivation for convenience, and motivation for comfort (Edelson et al., 2009). Hence, these forms of motivations have a significant impact on a person eating behaviour. For example, the motivation to stay safe or healthy and active tend to incentivize one decision to consume breakfast regularly or take foods lower in cholesterol (Ostachowska-Gasior, Piwowar, Kwiatkowski, Kasperczyk, & Skop- Lewandowska, 2016; Sakurai et al., 2017).

Again, behavioural belief in the TPB refers to individuals' perception of the consequences of target behaviour (Liao et al., 2016). Ajzen (1991) argued that the extent or importance of the difference between perception and expectation is positively related to the intensity of the attitude an individual espouses (Ajzen, 1991). That is, how significant an individual will perceive the consumption of breakfast to impact on their wellbeing will have a direct bearing on the kind of attitude a worker will have towards the said risk.

Subjective norms on the other hand, refer to the stress an individual feels due to how he or she is perceived by others in terms of whether the individual implements target behaviours or not (Ajzen, 1991). According to Liao et al. (2016), the others in this context are in reference to people the individual views as important and people who are equally able to have long-term influence on the individual actions or behaviour. Hence, how a person sees their parents, colleagues, friends, school, etc. views on breakfast tend to influence their attitude towards breakfast intake.

Perceived behaviour control refers to how an individual assesses behaviour implementation as influenced by control beliefs (Ajzen, 1991). Control can be subdivided into internal and external control factors. Self-efficacy associated with the internal factors look at the individual's belief in his or her capability in terms of expected outcomes he or she will get from consuming breakfast (Bandura, 1998). It considers the complexity of behaviour implementation perceived by the individual, and self-confidence regarding successfully implementing behaviours (Ajzen, 2002). Generally, numerous studies have confirmed the theory of planned behaviour across suitability several fields particularly in assessing individual healthy eating behaviour (Chan & Tsang, 2011) physical activity (Duncan, Ravis, & Jordan, 2012) and breakfast consumption (Conner, Hugh-Jones, & Berg, 2011). The theory asserts that intentions, formed from attitudes, subjective norms (SN) and perceived behavioural control (PBC), are the most important precursor to perform (or not perform) a behaviour (Kennedy et al., 2017). The higher a person's attitudes and subjective norm, the greater the perceived behavioural control will influence the person intention to perform a particular behaviour (Mullan, Wong, Kothe, & MacCann, 2013 ). The TPB has been effectively used in children and adolescents' studies to explain between

50-60% variation in diet-related intentions, and 6-19% of the variance in behaviours (Riebl, et al., 2015). Attitudes were most strongly associated with intention to perform a diet-related behaviour, whilst intention was most strongly associated with behaviour, (Riebl, et al., 2015) consistent with a previous meta-analysis including adolescents (McEachan et al., 2011).

### **2.2.2 Health Action Process Approach**

In particular, it has been argued that the Health Action Process Approach (HAPA) (Schwarzer, 2016) may offer a more useful model of health behaviour than the TPB (Sutton, 2008) since the HAPA includes post-intentional variables and constructs of perceived self-efficacy and action planning. As such it is deemed to provide a more complete model of health behaviour than that of the TPB. The HAPA is a social-cognition model of health behaviour which contends that the performance of health behaviour is a process which includes a motivational and a volitional phase (Schwarzer, 2016). In the motivational phase the individual forms an intention to either adopt behaviour, or not perform the behaviour. The subsequent volitional phase covers the processes of implementing intentions into actual behaviours, and includes planning, maintenance self-efficacy and recovery self-efficacy (Schwarzer, 2016). In the motivational phase, risk awareness, outcome expectancies, and perceived self-efficacy lead to the formation of an intention. Risk awareness is an important component as a minimum level of threat or concern must exist before an individual considers the benefits of possible actions and reflect on their inability to actually perform them (Schwarzer, 2016). Risk awareness is also split into two dimensions of vulnerability and severity. Vulnerability is the perceived probability of being affected by a health threat, and severity is the perceived relevance of the threat. Health risks



refer to any threat to one's immediate or long-term health and well-being (Schulenberg & Maggs, 1999). If an individual is aware of the risks of not eating breakfast, then this will increase their likelihood to consume breakfast daily. Different positive and negative outcome expectancies are then balanced. This leads to formation of a behavioural intention if the outcomes are perceived to be more beneficial than not taking action. In relation to breakfast consumption this will involve evaluating the potential outcomes of consuming or not consuming breakfast. Individuals who believe that taking breakfast will result into positive outcomes will show more willingness than those who do not regard breakfast intake to result into a positive outcome. Action self-efficacy is seen as the most influential motivational factor and a strong predictor of behavioural intentions (Schwarzer, 2016). Persons with high self-efficacy are more likely to attain their goals as they can set clear objectives and are optimistic about their capabilities and competence to perform and achieve their desired behaviour (Sniehotta, et al., 2005).

Goal intention in the HAPA is similar to the behavioural intention in the TPB. However, at this stage the models differ as according to the HAPA, once an intention to perform behaviour is formed, the behaviour must be planned, initiated, and maintained, and relapses have to be managed. These constructs form the volitional stage of the model. The most commonly used version of the HAPA views the stages as a continuum where planning mediates the intention-behaviour relationship (Schwarzer, 2016). This means that individuals with high intentions are more likely to engage in action planning, and those with low intentions are more likely to achieve their desired behaviour than those with lower intention (Sutton, 2008). In relation to breakfast consumption, the model would predict that those with greater intention to

eat breakfast will be more likely to make action plans, for example, by preparing menu on the meals to take at each morning or in the case of students go to the dining each day to take their breakfast. Consequently, there will be a higher probability of implementing behaviour. As well as being dependent on action planning, the HAPA suggests successful regular breakfast consumption is also dependent on perceived capability in maintaining the behaviour (maintenance self-efficacy) and perceived capability in coping after a period of absence in behaviour (recovery self-efficacy).

### **2.2.3 Theory of Food**

According to Allen (2012), even though human beings progress to become actively involved with their food environments yet their interactions with and within these food environments can be extremely multifaceted, in that they are influenced not merely by biological factors alone but are also shaped other factors such as, technological, sociocultural, and ultimately cognitive factors in which food is thought, acquired, processed, distributed, and eaten. As such, influencers of person dietary practices or eating habit happens to be shaped by internally related as well as externally related factors.

As rightly indicated the consumption behaviour, or “the thoughts, actions, and intents that an organism enacts in order to ingest solids of liquids”, regulates the dietary intake as well as the quantity and quality of foods consumed (Elsner, 2002, p. 18). Generally, hunger or appetite stimulates humans to eat food as a source of energy, which is essential for every human being existence. Likewise, appetite improves an individual eating behaviour as well as their dietary intake. On the contrary, anorexia or lack of appetite lessens eating behaviour and consequently affects dietary intake. Meaning, a child’s breakfast intake is controlled in part by physiological,

technological, sociocultural and cognitive factors (Allen, 2012; Furman & Papavasiliou 2012).

For instance, mood has been identified as one of the biological factors that happened to a child eating habits. Particularly, negative mood such as, feeling of dejection (Paquet, St-Arnaud-McKenzie, Kergoat, Ferland, & Dube, 2003), solitude (Wikby & Fagerskiold, 2004), anger (Paquet et al., 2003), grief and anxiety (Wikby & Fagerskiold, 2004) have been found to reduce a child's nutrition outcomes while positive mood such as, feelings of well-being have been associated with enhanced nutrition (Dubé, et al., 2007).

Likewise, other environmental factors such as, social facilitation has been found to moderate people eating habit. For instance, social facilitation of food consumption or possibly consuming in the company of others has been found to be a key social arrangement that improve individual eating patterns or habit (Locher, Robinson, Roth, Ritchie, & Burgio, 2005; Nijs, et al., 2006; Dube et al., 2007). On the contrary, eating by oneself has been identified to decrease individual eating habit and patterns (Larrieu, et al., 2004; Locher et al., 2005). Also, setting has been found to moderate the dietary practices of individuals (Allen, 2012). Expressly, it has been revealed that environments that appear to be visually appealing to the children especially when it comes to elements such as, clean environment, colourful décor, nice furniture, quiet surroundings, cloth table linens, and soothing lighting moderate their eating outcomes (Gibbons & Henry, 2005; Nijs et al., 2006; Wikby & Fagerskiold, 2004). In contrast, environment found to portray or be characterized with poor ambiance such as, unclean environment, noisy environment, bright lights, paper table linens or lack of

table linens, and dull décor were linked with poor eating outcomes (Gibbons & Henry, 2005; Wikby & Fagerskiold, 2004).

As indicated earlier eating patterns may not to be only shaped by biological factors but also by other sociocultural factors as well. For instance, a person's food selection, meal pattern and the person himself influence the food eating patterns of the individual (Brombach, 2001). Moreover, within the sociocultural context, some foods and meals uphold ritual significance (Siskind, 1992) hence, the cultural significance of certain food and food habits tend to be very significant to the traditional communities as well as the older generation (Holtzman, 2009). Hence, it comes as not very surprising when the works of Wikby and Fagerskiold (2004) posited that older adults favoured traditional meals and familiar foods and happened to ignore unfamiliar foods.

Again, issues with regards to food accessibility and readiness happen to shape individuals eating patterns. For instance, functional restrictions such as, inability to shop, cook, and self-feed tend to restrict one access to certain kinds of food hence, resulting in the patronage of less healthy foods (Donini, et al., 2008). Also, oral health such as, one ability to chew or swallow certain kinds of food has been found to predict or influence the kind of foods an individual decides to patronize or decide to consume (Donini et al., 2008). Evidently as the theory of food found a person food eating patterns to be moderated by series of factors; biological factors, technological, sociocultural and cognitive factors, this study will employ it as its theoretical framework to ascertain how these antecedents influence Ghanaian student's breakfast consumption.

### **2.3 Breakfast Consumption Patterns of Students**

A study done by Ghaffari et al. (2015) sought to look at how the breakfast consumption patterns of middle school students can be explained by the Theory of Planned Behavior (TPB). The experimental design was undertaken for students in students in Qom City during the academic year 2012–2013. The study had two set of groups; the experimental group and the control group. Moreover, in terms of the composition of the study group, 97 students each were randomly assigned to both the experimental and the control group. Questionnaire item based on the scale of the theory of planned behaviour was used as the study's main data collection instrument. Again, the study developed educational content via delivering speech, discussion groups, pamphlets, and posters. The developed educational content was given to the students during five sessions and for parents in one session. To assess the effect of the educational intervention, a post-test study was carried out two months after the intervention. The study used independent t-test, and repeated measures to assess the intervention impact. Results from the study showed that 36.7% of the students in the experimental group breakfast consumption patterns stood at one times per week. However, after the completion of the educational program, the experimental group breakfast consumption patterns stood at only 32.7% per week. This suggests that 67.3% of the students in the experimental group did not consumed breakfast after the intervention. Even though the study was able to identify the breakfast consumption as well as identify the possible reasons that accounted for the participants decision not to consume most of the served breakfast.

However, in the study of Karimi, Hashemi and Habibian (2008) which sought to assess the breakfast consumption pattern among Iran pupils came to the conclusion that nearly 53.4% of the pupils consumed breakfast at all times in the week. In the

same study, it was also established that 48% of the pupils didn't take breakfast regularly. Again, in this study, Karimi et al. (2008) result failed to report on the possible reasons that accounted for the respondents infrequent intake of breakfast. Also, with the study of Vahedi et al. (2007) which sought to whether elementary school students in the city of Sari consumed milk as part of the meals served as breakfast. Evidently, result from the study suggest that came only 62% of the city elementary school children and 49% of the village elementary school children consumed a unit of milk daily. However, in comparing the boys milk consumption rate to that of their females counterparts, it was established that only 59% of boys and 55% of consumed a unit of milk daily. Hence, the study concluded that the milk intake of the elementary school students were less than the recommended daily intake.

The study of Turki et al. (2019) assessed the relationship between breakfast consumption habits and cognitive/academic performances among primary school children in Riyadh. The study relied on a cross-sectional study to investigate this relationship among 6 to 12 years old pupils. The study used the anthropometric measurements to calculate the body mass index (BMI) of the sample. However, when it came to the assessment of the pupil breakfast consumption pattern, the study used a self-reported questionnaire to collect information on their breakfast consumption habits. A total of 384 students were included in this study. On the students breakfast consumption patterns, it was revealed that 60% of the selected primary school children in Riyadh took breakfast in more than four times in a week. This suggests that primary school children breakfast consumption pattern in Riyadh was a little bit higher than that of the Iran pupils as their consumption pattern reported in the study of Karimi et al. (2008) stood at 48%.

Likewise, the breakfast consumption patterns reported in the study of Turki et al. (2019) among primary school children in Riyadh tend to be consistent with the one reported in the study of Taha and Rashed (2017) in Abu Dhabi. Taha and Rashed (2017) work sought to assess the impact of breakfast consumption on the academic performance of young female students in the emirate of Abu Dhabi. The study sample came from 130 female students whose ages fall within the age bracket of 15-19 years. The study used self-reported questionnaire to collate the respondent breakfast consumption pattern whereas the students average grade score on all their subjects in the final year was used as the proxy for their exam score. On the students breakfast consumption patterns it was revealed that 62% of the students reported to be eating breakfast everyday. However, to the remaining of the respondents that is 38%, their breakfast consumption pattern was quite irregular and for that matter not very frequent.

In the same country context thus, Riyadh, a work by Javaid and Munir (2018) used a cross-sectional research design to assess the relationship between breakfast skipping and emotional and academic behaviour among medical students. According to Javaid and Munir (2018), their decision to use cross-sectional design was largely because their study had to collect the same set of information from the study respondents. Accordingly, the study selected 100 medical students from the first Professional MBBS at Princes Nourah Bint Abdulrahman Women University, Riyadh, Saudi Arabia. As the study wanted to ensure consistency in its data collection, the study used a questionnaire items to identify the students breakfast consumption trends as well as their reasons for skipping breakfast. Results from the study showed that only 40% of the students took breakfast after their first period. However, 60% of the

respondents skipped taking breakfast in the morning. Again, with regards to the reasons that accounted for the students breakfast skipping, reasons such as the fear of getting up late, not being hungry enough or distaste for food accounted for their non-intake of breakfast. Results from these two studies suggest that medical students breakfast consumption pattern is substantially lower than high school students in the same country that is Riyadh as found in the study of Turki et al. (2019).

Also, in the context of Ghana, a study by Ackuaku-Dogbe and Abaidoo (2014) sought to examine the level of breakfast skipping among medical students and its effect on their attention span and level of fatigue during clinical sessions. The study used a cross-sectional design because per Ackuaku –Dogbe and Abaidoo (2014), their study attention was only to describe a given phenomenon (i.e. students breakfast consumption pattern of second year (pre-clinical) medical students studying basic sciences and clinical ophthalmology at the University of Ghana Medical School, Korle Bu-Accra. In all 317 samples were selected. With regards to their overall breakfast consumption patterns, it was revealed that only 28.08% of the medical students were taking breakfast regularly. Shockingly, more than half of the students that is, 71.92% were skipping breakfast. In terms of the breakdown of the breakfast skippers, 76.62% of the clinical basic science students skipped their breakfast whereas 67.48% of the clinical ophthalmology students skipped their breakfast. Even though, Ackuaku – Dogbe and Abaidoo (2014) looked at one of the dimension of this work that is how breakfast skipping affected the respondents attentions pan and level of fatigue yet it still failed to look at low breakfast intake affected the respondent's academic performance . Hence, their study result cannot be relied on to confirm the connection between breakfast intake and student academic performance within the Ghanaian context.



Similarly, in Ghana, a study by Intiful and Larrey (2014) assessed the breakfast habits and nutrient contributions of the breakfast meal to the days' nutrient intake among school children within the Manya Krobo in the Eastern Region of Ghana. The study decision to use a cross-sectional design was mainly because the study had to collect the same set data across a large pool of sample. Hence, with cross-sectional design ability to ensure data consistency in terms of data collection, Intiful and Larrey (2014).

In their study, the 24-hour dietary recall method was used to gather information on the children's food intake. On the statistical tool, t-test was used to compare the differences between means of variables of breakfast consumers and skippers. Apparently, results from the study showed that nearly 85.5% of the respondents agreed to have taken breakfast on the day of interview. Also, in comparison, it was observed that more male students (i.e. 87.8%) took in more breakfast than their female counterparts (83.1%). On the reasons that accounted for breakfast skipping among the respondents, lack of food at home or lack of money was selected by most of the respondents as the main reason that limited their breakfast intake. Again, it was established that breakfast takers had significantly higher energy and nutrient level than those who skipped breakfast (energy 2259 verses 1360 kcal,  $p=0.039$ ; vitamin A 1534 verses 662ug/RE,  $p=0.001$ ; iron 22.9 verses 13.9 mg,  $p=0.017$ , zinc 9.9 verses 5.6 mg,  $p=0.034$ ). The breakfast meal contributed between 32-41% of the day's energy intake, and between 30-47% of micronutrient intake.

#### **2.4 Breakfast Consumption and Students Class Attendance**

Breakfast intake has been associated with a number of positive health outcomes; giving the individual a favorable dietary profile (Adolphus, Lawton, & Dye, 2013), maintaining of good body weight (Szajewska & Ruszczyński, 2010), increasing an individual mental alertness (Sandercock, Voss, & Dye, 2010), and also improving the absorption rate in the body (Mamerow, 2014). On this premise, this section of the work seeks to explore the linkage between breakfast intake and class attendants.

In the studies done by Cook, Ohri-Vachaspati and Kelly (1996) and Wahlstrom and Begalle, (1999) in Minnesota, it was revealed that providing students access to free breakfast daily improved the student's enrolment and attendance rate significantly. Comparable results were reported in the study of Sandercock, Voss and Dye (2010) as their results recorded a significant positive relationship between breakfast consumption and student's class attendance. Similarly, it was established in the study of Rampersaud, Pereira, Girard, Adams and Metz (2005) that skipping breakfast is inversely related to low class attendance rate.

With the study of Acham, Kikafunda, Malde, Oldewage-Theron and Egal (2012), it explored the relationship between breakfast intake and students consumption patterns and class attendance. The study investigated household characteristics, feeding patterns and academic achievement of 645 schoolchildren whose ages were within the age bracket of 9-15 years and lived in the Kumi district of Eastern Uganda. The study relied on household questionnaires and school records to collate information on the student's socio-demographic factors, feeding patterns and school attendance. Results from the study reported a significant relationship between breakfast intake and

student's attendance. Specifically, students who took breakfast regularly had higher attendance than those who skipped breakfast. Though a significant relationship was established between breakfast and school attendance nevertheless, what remained unknown in their study is the number of times the students took breakfast within the week as well as the category of meal often taken by the students as breakfast. Also, a study done by Corcoran et al. (2015) used the Breakfast in School (BIC) implementation policy in New York City to estimate its impact on meals program participation, BMI, achievement, and attendance. Results from the study found small positive effects of BIC on students' attendance rates. Similarly, using BIC as their study context, the study of Murphy, Drake and Weineke (2005) explored BIC impact on student's participation, involvement and academic achievement. Evidently, results from the study showed that BIC piloted in upstate New York had modest improvements in students' attendance, behaviour, and lateness.

In a similar context, Imberman and Kugler (2014) provided strong quasi-experimental evidence on the effects of free breakfast provision on academic achievement and attendance. The study assessed the program impact on math and reading scores, attendance and report card among 5th grade students. Results from their study reported a significant relationship between BIC and students' academic achievement and school attendance. Moreover, in the case of Kenya, a school feeding programme implemented by the government to provide school children a cup of porridge everyday was found to have improved the student's class participations and attendance rate significantly (Vermeersch & Kremer, 2004). Specifically, Vermeersch and Kremer (2004) observed that student's participation in schools where breakfast was not provided stood at 27.4% whereas schools that provided breakfast meal to its

students had a participation rate at 35.9%. The study observed that the supply of cup of porridge to the students seems to have improved the students' attendance rate by about one-third. The study concluded that the increase in student's participation could have emerged from the porridge supply which tends to have attracted new children to the school and even improved the attendance rate of those that are already enrolled in the school. Though, the breakfast intervention appeared to have improved the student's class participation nonetheless, what still remained unclear form of student's involvement in class discussions or student's classroom attentiveness.

A study done by Mhurchu et al. (2013) explored the effect size of the breakfast intake on school attendance, achievement, psychosocial function, dietary habits and food security. Sixteen primary schools in the North Island of New Zealand were randomised in a sequential stepped wedge design to a free before-school breakfast programme consisting of non-sugar-coated breakfast cereal, milk products, and/or toast and spreads. Four hundred children within the ages of 5-13 years were selected from 25 schools. In their study, school attendance was defined as the proportion of students achieving an attendance rate of 95% or higher whereas the proxies used for assessing students' academic achievement were literacy, numeracy and self-reported grades. Results from the study showed that breakfast interventions implemented across the selected schools did not have any effects on the children's school attendance rates. Although, the study results reported no form of relationship between breakfast intake and class attendance yet possible reasons that could have accounted for such insignificant relationship was not identified. For instance, the study could not establish whether the time for the consumption of breakfast or the category of foods served as breakfast accounted for such insignificant relationship between breakfast and class attendance.

Likewise, in the study of McEwan (2013), no significant effect was found between breakfast consumption and students test scores, school attendance, and grade repetition of providing free high-calorie meals to poor children. Also, within the same setting, the work of Leos-Urbel et al. (2013) sought to compare the outcomes in early adopter schools (those implementing BIC before the test) with those in late adopting schools (implementing after the test). Results from the study produced a significant intent-to-treat effects of BIC on reading and math achievement (0.10 s.d.), with substantial effects for previously low-achieving students (0.13 – 0.14 s.d.), Hispanics (0.14 – 0.15 s.d.), and low-BMI students (0.26 s.d.). However, with regards to breakfast in classroom impact on students' attendances, the provision of free breakfast recorded no impact on attendance rates. Even though, the study of Anzman-Frasca et al. (2015) found a positive, statistically significant effect of free breakfast on students' attendance, nonetheless, the effect size was still found to be very small hence, limiting the validity of their study claims. Interestingly, reviews under this section tend to have produced three sets of narrations. On one hand, a significant relationship has been reported between breakfast intake and student's attendance while in other context; either a little effect size or no effect size has been reported between breakfast intake and student's attendance. Clearly, this suggests that it is not in all cases that breakfast intake particularly those that are provided as intervention result in improved attendance. Its impact becomes quite substantial particularly among students who come from most deprived and poor homes as found in the studies of Acham et al. (2012) in Eastern Uganda.

## **2.5 Breakfast Consumption and Students' Academic Performance**

According to Bruening et al. (2011) consuming breakfast daily increases students' presence at school and consequentially decreases students' rate of absenteeism. Its regular consumption has also been found to improve students' mental and cognitive abilities. For instance, Adolphus et al. (2016) and Iovino et al. (2016) observed that taking breakfast regularly had a meaningful effect on the cognitive performance of a child particularly in the areas of attention, memory, problem solving, and logical reasoning. Likewise, other positive outcomes such as, enthusiasm, interest, energy level, mental alertness, joy and willpower have all been found to increase significantly among regular breakfast eaters than in non-breakfast eaters (Gardner, et al. 2014). All these positive consequences of breakfast consumption are noted to improve student's participation and interest in the classroom. Accordingly, this section of the work seeks to explore the connection between breakfast intake and students' academic performance.

A study done by Turki et al. (2019) which explored the relationship between breakfast consumption habits and cognitive/academic performances among primary school children in Riyadh came by the following conclusions. Children who consumed breakfast regularly were found to be twice more likely to achieve higher cognitive scores than those who skipped taking their breakfast. A greater percentage of school children who consumed breakfast regularly achieved excellent scores in mathematics (78%), science (87%), and Arabic language (98%). Accordingly, the study concluded that regular consumption of breakfast has a short-term positive impact on the cognitive function and academic performance among young children hence, they recommended that school breakfast programs should, therefore, be developed and implemented to promote healthy eating habits among school-age children.

Comparable results were found in the study of kawafha (2013) as the study results reported a significant positive relationship between breakfast consumption and students' academic performance among primary school children in northern Jordan. kawafha (2013) study purpose was specifically to identify the relationship between skipping breakfast and academic achievement of primary school children in the northern area of Jordan. The study sample came from 453 primary school children within 3 areas of northern Jordan. With regards to the study data analysis method, the study used a decretive correlation test for the relationship analysis.

Likewise, a study done by Taha and Rashed (2017) affirmed similar relationship in Abu Dhabi as their results posited a statistically significant relationship breakfast intake and students academic performance ( $p = 0.00$ ). Their study aim was mainly to examine the effect of breakfast intake on the academic performance of young female students in the emirate of Abu Dhabi. Hence, the study distribued a total of 130 questionnaires to female students whose ages were between 15-19 within two private schools in Abu Dhabi. Again, the study also reported a lower score among breakfast skippers.

In using Korea Youth Risk Behavior Web-based Survey from the period of 2009-2013 as their study scope, Kim et al. (2016) investigated how the frequency of several food items such as fruit, soft drinks, fast foods, instant noodles, confectionaries, vegetables, and milk and the consistency of meal times (i.e. breakfast, lunch, and dinner) influence students' academic achievement. In all 359,264 adolescents between the ages of 12-18 years were selected from the Korea Youth Risk Behavior Web-based Survey. Again, information on cofounding variables such as frequency of

physical activities, obesity, place of residence, subjective assessment of health, stress level, socio-economic status, and parental level of education were collected to assess its moderating effect these variables had on dietary consumption patterns and student academic performance. The study used the multinomial logistic regression analyses to analyze the relationship results. Result from the study suggests that the frequency of breakfast intake (AOR 2.34, 95% confidence interval [CI] 2.20–2.48), fruits (AOR 1.73, 95% CI 1.62–1.86), vegetables (AOR 1.48, 95% CI 1.37–1.61), and milk (AOR 1.35, 95% CI 1.28–1.43) improved the adolescents academic scores ( $p < 0.001$ ). However, the consumption of other meals such as soft drinks (AOR 0.42, 95% CI 0.38–0.46), instant noodles (AOR 0.62, 95% CI 0.55–0.70), fast food (AOR 0.83, 95% CI 0.72–0.96), and confectionaries (AOR 0.86, 95% CI 0.80–0.93) posit an inverse effect on adolescent academic performance. Hence, Kim et al. (2016) concluded that the frequency of meal as well as the kinds of meals consumed as breakfast (i.e. fruits, milk and vegetables) had a significant positive influence on student academic performance.

Likewise, in the same country that is, Korea, Wi-Young (2013) came by the same conclusion as their study sought to establish whether the rate of breakfast intake has any direct effect on Korean students academic performance. Similarly, in their case data was retrieved from Korea Youth Risk Behavior Web-based Survey done where 75,643 adolescents from grade 7–12 were selected. The study used the multivariate logistic regression analysis to analyse the relationship between rate of breakfast intake and students academic performance. Also, confounding variables such as age, body mass index, frequency of smoking, frequency of drinking, parents' academic status, economic status, regularity of extensive physical activity and frequency of muscular



strength exercises, and level of mental stress were included to ascertain their effect they pose on breakfast intake and student academic performance. Apparently, results from the study revealed that for the male participants the odds ratios (ORs) for achieving average or higher academic performance in reference to the frequency of breakfast consumption per week when taken once per week stood at 1.004 ( $p > 0.05$ ); when taken twice per week stood at 0.915 ( $P = 0.153$ ); 3 days per week, 0.928 ( $p < 0.05$ ); 4 days per week, 1.087 ( $p < 0.05$ ); 5 days per week, 1.258 ( $p < 0.001$ ); 6 days per week, 1.473 ( $p < 0.001$ ); and every day, 1.700 ( $p < 0.001$ ). When it comes to the female respondents, the ORs for achieving average or higher academic performance with regards to the frequency of breakfast consumption once per week, 1.068 ( $p < 0.05$ ); twice per week, 1.140 ( $p = 0.031$ ); 3 days per week, 1.179 ( $p < 0.001$ ); 4 days per week, 1.339 ( $p < 0.001$ ); 5 days per week, 1.449 ( $p < 0.001$ ); 6 days per week, 1.768 ( $p < 0.001$ ); and every day, 1.922 ( $p < 0.001$ ), compared to no breakfast per week. Results from the study suggest that the taking breakfast in all the seven (7) days per week positively improved both male and female adolescents academic scores.

Similar conclusion was made in the study of Masoomi, Taheri, Irandoust, H'Mida and Chtourou (2019) as their results showed that regular intake of breakfast and snack meals had a statistical significant influence on the individual cognitive functions ( $p < 0.05$ ) and physical activity level ( $p < 0.05$ ). Again, it was established that regular intake of breakfast had a statistical influence on student academic achievement ( $p < 0.05$ ). On the other hand, snack intake recorded a statistical insignificant relationship on academic performance ( $p > 0.05$ ). Again, on the predictive power of the independent variables, breakfast and snack meals explained 79% of the variance in cognitive performance, 77% of the variance in academic performance and 70% of the

variance in physical activities. Accordingly, Masoomi et al. (2019) argued that the consumption of breakfast had a statistical influence on student academic performance and cognitive performance. Whereas the participants final exams score was used as the proxy to assess their academic performance, cognitive function questionnaire and international physical activity questionnaire were respectively used to assess the respondents cognitive performance and physical activities. Again, what has to be noted is that even though breakfast intake had a direct influence on a person's academic performance nonetheless, its ability to influence the eater academic prowess was dependent on the kind of meals taken as breakfast.

Also, Ptomey et al. (2016) affirmed similar relationship in their study as their work observed that habitual breakfast eaters obtained higher scores in all the three Wechsler Individual Achievement Test (WIAT-III) ( $p < 0.05$ ) than regular breakfast skippers ( $p > 0.05$ ). Again, when it comes to the impact of the meals consumed, it was observed that consuming fruit juice as breakfast had an inverse effect on reading comprehension and fluency test scores and mathematics test scores ( $p < 0.001$ ). However, the consumption of whole grains reported a statistical significant positive relationship on test scores on subjects such as reading comprehension and fluency and mathematics ( $p < 0.05$ ). Particularly, students whose breakfast meals were made up of whole grains Hence, Ptomey et al. (2016) shared the view that the content of meals eaten as breakfast accounted the difference in academic score between regular breakfast takers and regular breakfast skippers. Specifically, with their study, its data were collated from the fall of 2011 from 698 residing in the state of Kansas. With regards to the proxies used to assess the participants academic performance, the Wechsler Individual Achievement Test (WIAT-III) were used. Also, through recall

the participants were asked to identify all the types of meals and drinks they took in that particularly morning of the study.

More so, a study done by Valladares et al. (2016) confirmed similar results in Chile as their study sought to assess the relationship between academic performance and eating behavior of university students in Chile. The study randomly selected 680 college students from the various tertiary institutions in Chile. From this sample, 409 (60%) were females and the remaining 271 were males. The Three-Factor Eating Questionnaire (TFEQ), which assesses the 3 dimensions of eating behaviour; cognitive restriction (limiting own intake), uncontrolled eating (inclination to eat), and emotional eating (control of food intake in the context of negative emotions) was used in their study. The students' academic performance was assessed through their grade point average (GPA). Evidently, results from the study suggest that women had significantly higher scores in the "emotional eating" dimension than men. The eating behavior analysis showed that female students with higher GPAs (above 5.5) had statistically significantly lower uncontrolled eating scores and higher cognitive restriction scores than women with lower academic performance (below 5.5). However, when it came to the male respondents' results from the study reported an insignificant relationship between their eating behavior and academic performance. Accordingly, the study concluded a significant positive relationship between eating behavior and academic performance of female university students in Chile.

Consistent view was espoused in the study of Imberman and Kugler (2014) as their study observed that the implementation of breakfast in class particularly in large urban school district had a substantial positive effect on the students' reading and math achievement, even when the program was implemented in a short time before

the test. Also, in a quasi-experimental design, Wesnes et al. (2003) randomly assigned students to receive one of four types of breakfast on successive days (one of two types of cereal, a glucose drink, or no breakfast) and found that students eating a cereal breakfast performed better on a series of tests of attention and memory over the course of the morning than those who did not received breakfast.

A study done by Acham et al. (2012) assessed the effect size of breakfast and lunch time meal on Uganda school children academic achievement. In the same study, the household characteristics, feeding patterns and academic achievement of 645 school children between the ages of 9-15 years living in the Kumi district, eastern Uganda were assessed. The study used grade one schools and grade four schools as their study population. Household questionnaires and school records were used to collect information on socio-demographic factors, feeding patterns and school attendance. Results from the study showed that under achievement (i.e. the proportion below a score of 120.0 points) was high (68.4%) among the students. However, the effect size of the breakfast intake was found to be significantly higher among children from less poor households. It was also revealed that the effect size of breakfast intake on students achievement was significant higher in male students than in female students. However, on the total study results, breakfast effect on academic achievement was identified to be significantly higher among children from less poor households.

Additionally, Javaid and Munir (2018) corroborated similar results among first year medical students at the Professional MBBS at Princes Nourah Bint Abdulrahman Women University, Riyadh, Saudi Arabia as their results observed a significant relationship between breakfast intake and students academic performance. Again, a study by Lundqvist et al. (2019) undertook a meta-analysis to unravel the effect size

of breakfast intake on adolescents wellbeing and academic achievement. Using the data points of January 2000 and October 2017 as the selection criteria, the study sourced its data from electronicdatabases such as, PubMed, CINAHL, Web of Science, and PsycINFO between. Again, the inclusion criteria used in the article selection were published articles from peer-reviewed journals with full text in English, it should be quantitative studies that have collected its primary data from school-aged children, and adolescents aged from 6 to 18years as participants, performed entirely or partly in countries with advanced economies, except Japan andTaiwan. Apparently, twenty-six studies met these inclusion criteria. Results from the review studies showed that eating breakfast studies reported positive and conclusive effects on cognitive performance, academic achievement, quality of life, well-beingand on morbidity risk factors.The overall assessment of the studies indicated positive effects of eating breakfast.

A similar meta-analysis studies done by Adolphus et al. (2016) using studies between the time period of 1950 to 2013 came by comparable conclusions. Their study drawn its data from databases such as Ovid MEDLINE, PubMed, Web of Science, the Cochrane Library, EMBASE databases, and Psych INFO. In all thirty-six articles that have explored the effects of breakfast intake on class behavior and academic performance in children and adolescents were used. Likewise, their study looked that at the breakfast effect size on different population groups that is, the undernourished or well-nourished children and adolescents from differing socio-economic status (SES) backgrounds. The habitual and acute effects of breakfast and the effects of school breakfast programs (SBPs) were considered. Results from their analysis showed a significant positive relationship between breakfast intake and on-task behavior in the classroom. It was also revealed that habitual breakfast (frequency and

quality) and schools breakfast programs had a positive effect on children's academic performance with clearest effects on mathematic and arithmetic grades in undernourished children. Hence, their study observed that increased frequency of habitual breakfast is consistently positively associated with academic performance. Again, some section of the reviewed studies suggested that quality of habitual breakfast, in terms of providing a greater variety of food groups and adequate energy, was positively related to school performance.

On the other hand the study results of Corcoran et al. (2015) held contrary view to these claims as in their study it was revealed that breakfast provision and intake did not show any evidence of hoped-for gains in academic performance, nor of feared increases in obesity. Corcoran and colleagues used the Breakfast in School (BIC) implementation policy in New York City to estimate breakfast intake impact on indicators such as, body mass index, achievement, and attendance. Corcoran et al. (2015) found an insignificant relationship between breakfast provision and students reading and math achievement among grades 4-8 students. Similarly, in using administrative data from Chile, McEwan (2013) recorded no significant relationship between breakfast intake and students test scores, school attendance, and grade.

In the same direction a study by Leos-Urbelet al. (2013) reported no significant association between breakfast intake and students' academic scores. Specifically, Leos-Urbel et al. (2013) sought to assess meal programme participation, student attendance and standardized mathematics and reading test scores. They found no impact on educational outcomes from meal programme participation. Finally, a study by Mhurchu et al. (2013) which sought to explore the effect size of the breakfast intake on school attendance, achievement, psychosocial function, dietary habits and

food security reported no significant relationship between breakfast intake and students' academic performance. The proxies the study used in assessing the students' academic achievement were literacy, numeracy and self-reported grades. Their study randomly selected sixteen primary schools within the North Island of New Zealand. In all four hundred children within the ages of 5-13 years were selected from these schools.

## **2.6 Comparison of Students Academic Achievement Among Breakfast Takers and Skippers**

A study done by Kleinman et al. (2002) came to the conclusion that even though student's participation in schools implementing school-based breakfast program seems to have improved their breakfast intake nonetheless, in comparing the effect size of the breakfast intake on the student's achievement, it was revealed that both breakfast takers and skippers exhibited no differences in their academic achievement and performance.

Also, a study by Burrows et al. (2017) performed a meta-analysis to assess the effect size of breakfast intake and academic achievement among college/university students. The criteria used in the selection or inclusion of an article are that; the study has to be conducted in higher education (i.e., college, university), have to report measures of dietary intake and academic achievement, and report the association between variables. In all, eight electronic databases were searched for studies published in English to January 2016. Data were extracted using a standardised tool, and studies were assessed for methodological quality. Seven studies were included, with four rated as positive quality, and the remaining three rated as neutral. Most studies were cross-sectional ( $n = 4$ ), and conducted in America ( $n = 5$ ). The most common dietary

outcomes were fruit and vegetable (n = 3), and breakfast consumption (n = 3). Standardised grade point average (GPA) was the most common measure of academic achievement (n = 4). In all, five studies reported low to moderate level of differences in academic score between breakfast takers and skippers. Likewise, in the study of Ptomey et al. (2016) it was established that regular breakfast eaters obtained higher scores in all the three Wechsler Individual Achievement Test (WIAT-III) ( $p < 0.05$ ) than regular breakfast skippers.

Equally, the study of Lundqvist et al. (2019) reported a significant difference between the academic performance of breakfast takers and skippers. Specifically, students who took regular breakfast recorded substantial scores in their grade point average than those who skipped breakfast. Again, in the studies of Philippou and Constantinou (2014) and that of Hoyland, Dye and Lawton (2009) it was established that breakfast takers enjoyed significant benefits in their cognitive function and reading abilities than breakfast skippers. Also, a study done by Taha and Rashed (2017) reported a significant difference in the academic performance of breakfast takers and skippers. Specifically, breakfast takers enjoyed higher grades whereas breakfast skippers witnessed lower score in their grade point average.

Again, a study done by Javaid and Munir (2018) in Riyadh, Saudi Arabi used a cross-sectional research design to assess the relationship between breakfast skipping and emotional and academic behaviour among medical students. The study used a questionnaire items to identify the students breakfast consumption trends as well as their reasons for skipping breakfast intake. Results from the study showed that only 40% of the students took breakfast after their first period. However, 60% of the



respondents skipped taking breakfast in the morning. Also, with the effect size of breakfast intake on students academic performance, it was observed that students who took breakfast enjoyed higher scores than those who skipped breakfast. Additionally, a study done by Kawafhato identify the relationship between skipping breakfast and academic achievement of primary school children in the northern area of Jordan reported a significant difference in breakfast skippers academic performance and that of breakfast takers. In their case, breakfast takers witnessed a significant gains in their academic score whereas skippers witness a lower grade in their academic score.

However, in the study of by Mhurchu et al. (2013) done in New Zealand, no significant differences were found in the academic scores of breakfast takers and skippers. Specifically, their study could not establish a significant relationship between breakfast intake and students academic performance. Corcoran et al. (2015) on their part also found an insignificant difference in the academic performance of breakfast takers and breakfast skippers. Their study assessed the effect size of school based breakfast program on the academic achievement of grade 4-8 students in New York City. Comparable result was reported in the study of McEwan (2013) as the study recorded no significant difference in the academic performance of breakfast takers and breakfast skippers. Again, a study by Leos-Urbelet al. (2013) reported no significant difference in the academic performance of breakfast takers and skippers. Specifically, Leos-Urbel et al. (2013) sought to assess meal programme participation, student attendance and standardized mathematics and reading test scores.

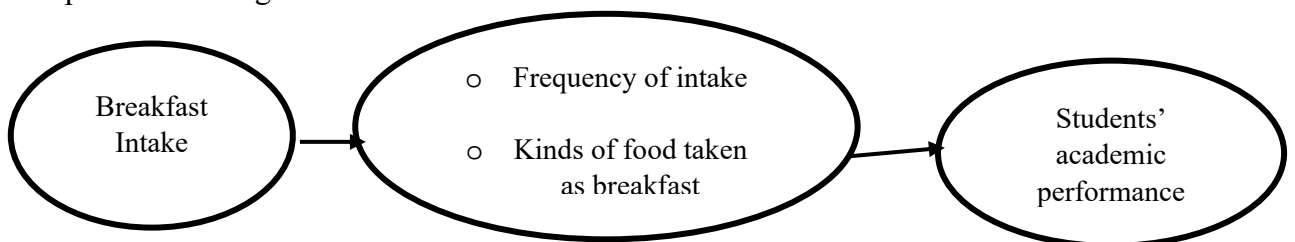
Finally, Turki et al. (2019) confirmed similar observation in their study as their results posited an insignificant difference in the academic performances of regular breakfast consumers and skippers. Again, it was observed that the long-term beneficial effects

of having regular breakfast on the academic performances of school children were not statistically significant. The study used a cross-sectional design to assess breakfast intake impact on schoolchildren whose ages fall within the age bracket of 6-12 years. The study used self-administering questionnaire to collate information about the respondents breakfast consumption patterns whereas A self-reported questionnaire was used to collect information on their breakfast consumption habits whereas three subjective academic scores were used as the proxies for the students academic performance.

## **2.7 Conceptual Framework**

According to Miles and Huberman (1994), a conceptual framework serves as a visual or written product, one that “explains, either graphically or in narrative form, the main things to be studied, the key factors, concepts, or variables and the presumed relationships among them. Specifically, what this study seeks to investigate is breakfast intake and student’s class attendance and academic performance. Hence, breakfast intake and student’s class attendance and academic performance become the key constructs within this study context. According to Sandercock, Voss and Dye (2010), providing breakfast to students either at home or at school tend to have consequential effect on their school attendance rate and participation and health status. Again, other positive behavioural outcomes such as, increased enthusiasm, interest, energy level, mental alertness, joy, and will power have all been found to be visible in students that continuously take breakfast in the morning (Gardner et al., 2014). Accordingly, taking breakfast regularly has been found to improve students focus, attentiveness and cognition prowess during the day especially particularly when faced in multifaceted visual tasks (Mahoney et al., 2005).

Additionally, same positive relationship between breakfast intake and students performance has been confirmed in the studies of Timlin and Pereira (2007), Piernas and Popkin (2009), Ostachowska-Gasior et al. (2016) and that of Sakurai et al. (2017), as their results in their respective studies have suggested that continuous intake of breakfast by adolescent result in improvements in their health status, physical activity, and equally help in minimizing their vulnerability to risk factors such as, obesity and cardio-metabolic disease. Again, breakfast intake has been found to improve student's attentiveness in class which in effect tends to have a consequential effect on students' academic performance. For instance, in the study of Lundqvist et al. (2019) a significant relationship was reported between breakfast and academic performance. Specifically, in their study, students who took breakfast regularly recorded substantial scores in their grade point average than those who skipped breakfast. Again, in the studies of Philippou and Constantinou (2014) and that of Hoyland et al. (2009) it was established that breakfast takers enjoyed significant benefits in their cognitive function and reading abilities than breakfast skippers. Also, a study done by Taha and Rashed (2017) reported a significant difference in the academic performance of breakfast takers and skippers. Specifically, breakfast takers enjoyed higher grades whereas breakfast skippers witnessed lower score in their grade point average. Accordingly, in this context it is expected that regularly breakfast takers will enjoy higher score in their intake as well as the kinds of food taken as breakfast has been presented in Figure 1.



**Figure 2.1: Conceptual Framework of the Study**

## CHAPTER THREE

### METHODOLOGY

#### 3.1 Introduction

This chapter dealt extensively with the research methodology. It provided details accounts on the research design used, the population the study sample came from, the sampling technique used for the sample selection. Also, at this chapter, the instrument used for the data collection and how the instruments were developed and pretested have all been presented. Again, how the study dealt with issues of ethics and how the study data particularly its secondary data were sourced and analysed have all been thoroughly discussed in this chapter.

#### 3.2 Research Design

According to Mamia (2006), the main purpose of a research design is to ensure that the evidence gathered helps us to validly answer the research questions a study poses prior to its commencement. Kumar (2011) asserted that to a large extent research design seeks to achieve two main purposes. First, it seeks to identify and develop processes as well as the logistical arrangements that will be needed to undertake a study. Its second purpose is to guarantee quality in these processes so that at the end of the study the conclusion made or obtained are deemed as valid, objective and accurate.

With the study goal to assess the connection between breakfast intake and student's academic performance and class involvement within the Ghanaian second cycle schools, the study was positioned within the cross-sectional research design.

According to Cohen, Manion and Morrison (2007), cross-sectional design enables a study to collate data on two or more variables to establish the relationship between the variables. Accordingly, with the study purpose to examine the relationship between breakfast consumption and students' academic performance, cross-sectional design best fitted the study purpose.

Again, as this study sought to collect its data from a large section of second cycles schools within the Ashanti Region of Ghana, cross-sectional design provided the best logistical means to achieve this objective. As rightly indicated by Bryman (2012) cross-section design are very useful particularly in instances where a study seeks to target a large set of population, produces numerical data, provides descriptive, inferential and explanatory information, collates standardized data (i.e. using the same instruments and questions for all participants) as well as establish the relationship between two or more variables (e.g. the relationship between breakfast intake and academic scores). Similarly, in this study a descriptive information will be provided on the students' breakfast consumption patterns, a standardize instrument will be used to collect the same level of information across the study respondents and consequently the linkage between breakfast intake and academic score and class attendance will be examined. Even though, there are many other designs available (e.g. case study, experimental, quasi-experimental and longitudinal design) nonetheless, judging from what this study sought to achieve with its objectives cross-sectional design provided the best means in ensuring that the evidence gathered validly responds to all the research questions set.

### **3.3 Study Population**

As rightly indicated by Marczyk, DeMatteo and Festinger (2005), it is after the identification of a population that the relevant sample and the criteria to use for the selection of the sample can be well identified. Specifically, the study targeted all second cycle schools within the Ashanti Region. Specifically, when it comes to the Ashanti Region, it has a total of 30 districts with one of the districts as Metropolitan, 7 as Municipals and the remaining 22 as Ordinary districts (Ghana Districts, 2020). However, when it comes to second cycle schools within the region, it is only 18 of the districts that have second cycle schools. In all the region has a total of 96 second cycle schools with the Kumasi Metropolis having the highest number of schools that is, 21 schools (Wikipedia, 2020). Per the Ministry of Finance report, the total number of students within these second cycle schools in the region is estimated at 75,000 (Ministry of Finance, 2016). However, since it is impossible to reach out to all the 96 schools a total of 50 of the schools within the respective districts of the region were used.

### **3.4 Sample and Sampling Strategy**

Looking at how the 96 second cycle schools within the Ashanti region are spread around the 18 districts within the region, it was impossible to sample all of them. Accordingly, in order to ensure that the schools selected were well spread across these districts, the region was divided into four clusters that is the northern, eastern, and western and the southern part of Ashanti Region. Accordingly, three second cycle school each within these clustered areas were sampled. Using the City Population Mapping (2019) as the study guide, the districts found in the Northern part of Ashanti Region were, Ejura-Skyere Municipal, Sekyere Afram Plains, Sekyere Central,

Mampong Municipal, Offinso North and Afigya Kwabre. Also, the districts found in the Southern part of the Ashanti Region are, Amansie West, Amansie central, Adansi North and Adansi-South. However, districts such as Asante Akim North, Asante Akim South, Asante Akim Central and Ejisu-Juaben are found in the Southern part of Ashanti Region whereas districts such as Ahafo-Ano North, Ahafo-Ano South, Atwima Mponua and Atwima Nwabiagya are also found in the Western part of Ashanti Region. Accordingly, from these four clusters, three schools each were randomly selected from these regional distributions. Meaning in all 12 schools were used as the study sample. Since the study wanted to ensure that the selected schools were well spread across all the districts of the Ashanti Region multi-stage cluster sampling was seen as the most appropriate. According to Bryman (2012), multi-stage cluster sampling enables a study to select sample from a given population that would be far more geographically concentrated than if a simple random or stratified sample was used. However, with the sample size, 50 students were randomly picked from the 12 schools making the entire sample size stand at 600 students.

### **3.5 Data Collection Tool**

As this study dealt with a large pool of respondents who were spread across the various parts of the region, structured questionnaire was used as the study's main data collection instrument. According to Saunders, Lewis and Thornhill (2009), using structured questionnaire helps a study achieve consistency in its reportage since the same instrument was to be used across all the respondents. Meaning, there would be no variation in the questionnaire used in a given school. Moreover, as this study is a similar to other works carried out in other context, the scale used was adapted from previous works. Specifically, the scale used to assess the respondents breakfast

consumption was adapted from the measuring scale used in the studies of Al Turki et al. (2018) and Seedat and Pillay (2019). The scale used in their study was previously used in the studies of Lazzeri et al. (2016), Javaid and Munir (2018), Mhurchu et al. (2010) and that of Mhurchu et (2013) and its validity has been confirmed in all these enumerated studies. This indicates that the scale validity and applicability across different contexts have been well confirmed in both developed and developing economies. The scale was made up of six (6) items in all measured on closed ended questions with only few on open-ended questions.

However, with the student's academic performance, their exams score on all the core subjects namely; Core Mathematics, English Language, General Science and Social Science were collected from their respective schools. Since the core subjects remain the only subjects that are synonymous within every second cycle school in Ghana and done by every student, they become the most valid subjects to use as a proxy to assess the students' academic scores. Moreover, the West Africa Senior School Examination grading system was used. The scoring and its corresponding interpretation have been presented in Table 3.1 below

**Table 3.1: WAEC grading system**

<b>Grades</b>	<b>Definition</b>	<b>Interpretation</b>	<b>Equivalent</b>
A1	Excellent	80% - 100%	1
B2	Very good	75% - 79%	2
B3	Good	70% - 74%	3
C4	Credit	60%- 69%	4
C5	Credit	55% - 59%	5
C6	Credit	50% - 54%	6
D7	Pass	45% - 49%	7
E8	Pass	40% - 44%	8
F9	Fail	0% - 39%	9

**Source:** West African Senior School Certificate Examination (2020)



In order to reduce biases in the respondent's attendance measure, the study adopted both self-report and the respective school class attendance records on each respondent. Conceptually, attendance is described as the total number of half day's students are present at school (including those slightly late for the morning or afternoon session e.g. due to a medical appointment) (Mhurchu et al., 2010). The main measure of attendance is the proportion of students achieving a school attendance rate of 95% or higher, which equates to students missing less than 2-3 days per school term. Other attendance outcomes are number of late, sick or medical days, justified absences (e.g. bereavement leave), and unjustified absences (truancy). Using both self-report and school attendance records will reduce response bias and enhance data triangulation as schools' records will be used to compare to the ratings given the respondents on their attendance rate.

### **3.6 Data Collection Procedures**

Prior to the commencement of the data collection exercise, a personal visit was made to the targeted institutions within the respective districts to discuss with the various school heads on what the study seeks to do. Upon this discussion any school that refused to participate was replaced with a comparable school within that same district in order to ensure that every selected district had the same number of schools. Discussions were also held with the respective schools' head with regards to date and time the researcher can come to the school and administer the questionnaire. Again, an introductory letter was obtained from the graduate school to confirm my identity as a graduate student at the University of Education, Winneba and equally indicate the purpose of the study. The distribution of the questionnaire was done taking into cognizant the agreed dates of each selected school. The administration of the

questionnaire took the period of three weeks to complete and was done by the researcher herself.

### **3.7 Instrument Validity and Reliability**

According to Saunders et al. (2009), the reliability of the data a study collects and the responses a study achieves depend largely on the design of its questions, its structure and composition and the rigour of its pilot testing exercise. However, in quantitative studies, it is required that instruments are pilot-tested at a comparable setting to establish the content and construct validity of each developed measuring scale. Likewise, in this study, the questionnaire was piloted at two schools namely; Afua Kobi Ampem Girls and Nkawie Secondary Technical Senior High to confirm the sample level of understanding on the various scale. After the pilot-test, any indications of ambiguities were corrected before the final questionnaire was presented to the study respondents.

Moreover, to assess the internal consistency of the measuring scale, the Cronbach's alpha was used to compute the alpha value of each given item. A Cronbach Alpha value of 0.70 or more was used as the proxy to establish whether a scale was reliable or not. Nunnally and Bemstein (1994) argued that the reliability scores for all the constructs that range between 0.70 and 0.90 prove that the instrument is highly reliable. Kline (2005) corroborates Nunnally and Bemstein view, when the author asserts that coefficient alpha values within the ranges of 0.7 and 0.8 are usually the acceptable indicator that a scale is reliable. Nonetheless, when dealing with psychological constructs, values less than 0.7 (but more than 0.6) are acceptable because of the diversity of the measured constructs (Kline, 2005).

### **3.8 Ethical Considerations**

In research, it is required that the study respondents are protected so that they do not fall prey to the investigation being undertaken (Creswell, 2014). Accordingly, it required of the investigator to inform participants about the purpose of the investigation so that respondents become aware of the purpose and intention of the study. Additionally, ethically, researchers are required not to disclose participants' information to third parties or expose respondent's identity in their study analysis. Hence, it is required that information such as respondents name, personal contacts, etc. is not taken when carrying out research. Accordingly, for the study to ensure that all these ethical dimensions were addressed, first, possible forms of traces that could make respondents fall victims as a result of the information provided were eliminated. For instance, respondents were not required to provide information about their names and contact details in this study. Again, in order to ensure that the respondents were aware of what this study sought to achieve, the respondents were thoroughly briefed and equally allowed to rescue themselves anytime time they felt uncomfortable to continue answering their questionnaire items.

### **3.9 Data Analysis**

Before the data was entered into the IBM Statistical Package for Social Sciences (SPSS) for analysis it was vetted for completeness and relevance. Any incomplete data was removed hence, only questionnaire that had been fully completed was used for the entire analysis. The analytical tools to use depended on what each objective sought to measure. For instance, on objective one, which examined breakfast consumption habits of Ghanaian second cycle school students, descriptive statistics was used. Specifically, frequencies and percentages were used to determine the patterns of the respondents' breakfast consumption rate.

However, on the second research objective that investigated the specific factors that resulted into student's breakfast skipping behaviours, the results were first aggregated to identify breakfast takers and skippers. Since, breakfast consumption was assessed on seven days span, respondents whose consumption fall above 5 days were categorized as breakfast takers whereas those whose consumption fall below 5 days were categorized as breakfast skippers. As indicated by Lazzeri et al. (2016) when assessing individuals or persons breakfast consumption rate it is important to assess them within two categories that is breakfast skippers and breakfast takers hence, those whose consumption fall below a certain threshold ought to be categorized as breakfast skippers whereas those whose consumption fall above a certain threshold ought to be categorized as breakfast takers. Accordingly, in this study the same procedure was used in categorizing the respondents along these lines.

With the respondent's attendance, the study used the recommendation of Mhurchu et al. (2010) in computing the students' attendance. According to Mhurchu and colleagues (2010), the measure of attendance is the proportion of students achieving a school attendance rate of 95% or higher, which equates to students missing less than 2-3 days per school term. Hence, students missing no days per school term scored an attendance rate 100% whereas those who missed less than 2-3 days per school term was rated as 95%. However, missing more than 15 days per school term resulted in an attendance rate of 75% or lower. After the aggregation of these variables, a probity regression analysis was used to explore the relationship breakfast consumption patterns (i.e. breakfast skippers and breakfast takers) had on the respondents' attendance rate.

On the next objective, that is, to examine how breakfast consumption affected students' academic performance, the study data on breakfast consumption and academic scores were aggregated. The aggregation of the respondents' breakfast consumption followed the same pattern as illustrated earlier. However, with the respondent's academic performance, their raw score in last academic term exams on the subjects of Core Mathematics, English Language, General Science and Social Science were collected from their respective schools. Following the WASSCE scoring grade, having a score of 80% - 100% was rated as excellent, 75%-79% as very good, 70-74% as good, 60-69% as credit, 55%-59% as credit, 50%-54% as credit, and 45%-49% as pass, 40-44% as pass and finally 0%-39% as fail. Afterwards, a probity regression analysis was used to explore the impact breakfast consumption patterns had on the respondents score on these four core subjects.

Finally, on the last research objective that is, compare student's academic achievement between breakfast skippers and breakfast takers, one-way Analysis of Variance (ANOVA) was used to assess whether there is any significant difference between breakfast takers and skippers score on these four subjects.

## CHAPTER FOUR

### RESULTS

#### 4.0 Introduction

This chapter presents results on the data obtained from the respondents with regards to their breakfast consumption patterns as well as the effect breakfast intake has on students' academic achievement. Accordingly, results on the respondents' breakfast consumption patterns together with the influence breakfast intake has on the respondent's academic performance and class achievement have been presented in the sub-sections under this section.

#### 4.1 Response Rate

The study distributed a total of 600 questionnaires to students within the senior high school within the Ashanti Region. From the questionnaires distributed, a total of 460 completed questionnaires were returned to the researcher. However, out of these received questionnaires, 47 were unused because of data incompleteness and 413 were usable for analysis, giving an effective response rate of 74.7%. This response rate is deemed sufficient for the present study data analysis, since per the writings of Mugenda and Mugenda (2003) having a response rate over 50 percent can be deemed as adequate. Accordingly, getting a response rate over 70 percent is more than adequate looking at the indicators of Mugenda and Mugenda (2003).

## 4.2 Demographic Characteristics and Response Rate

This section provides the background information about the respondents' demographic profile. Hence, the demographic profile of the respondents has been presented in sub-section 4.2.1 to sub-section 4.2.3.

### 4.2.1 Gender Distribution of Respondents

The sex distribution of the respondents has been displayed in Table 4.1

**Table 4.1: Sex Distribution of Respondents**

<b>Gender</b>	<b>Frequency</b>	<b>Percent</b>
Male	197	47.7
Female	216	52.3
<b>Total</b>	<b>413</b>	<b>100.0</b>

The gender distribution of the respondents in Table 4.1 show that out of the total of 413 respondents, 197 of them representing 47.7% were males with 216 of them constituting 52.3% being females. This suggests that most of the surveyed respondents were largely dominated by female students. Having most of the respondents being females is a positive sign hinting that most of the girls graduating from the Junior High Schools are continuing with their education at the senior-high school level.

### 4.2.2 Age of Respondents

The age distribution of the respondents has been presented in Table 4.2.

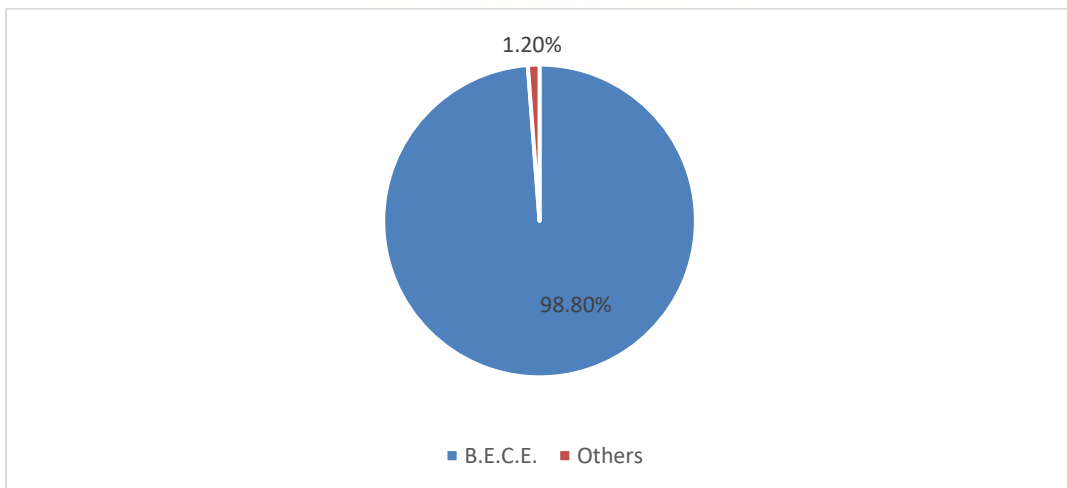
**Table 4.2: Age Distribution of Respondents**

<b>Age</b>	<b>Frequency</b>	<b>Percent</b>
11-15	10	2.4
16-20	403	97.6
<b>Total</b>	<b>413</b>	<b>100.0</b>

The age of the respondents in Table 4.2 show that a small section of the respondents thus, 2.4 Percent had their age within the age distribution of 11-15 whereas a significant portion of the respondents thus, 403 (97.6%) had their ages within the age bracket of 16-20 years. Results from the study suggest that many of the respondents ages correspond with the right age profiling of form three students where a student in the final year is expected to have their ages within the age bracket of 16-18 years.

#### 4.2.3 Respondents Academic Qualification

The educational background of the respondents has been presented in Figure 4.1.



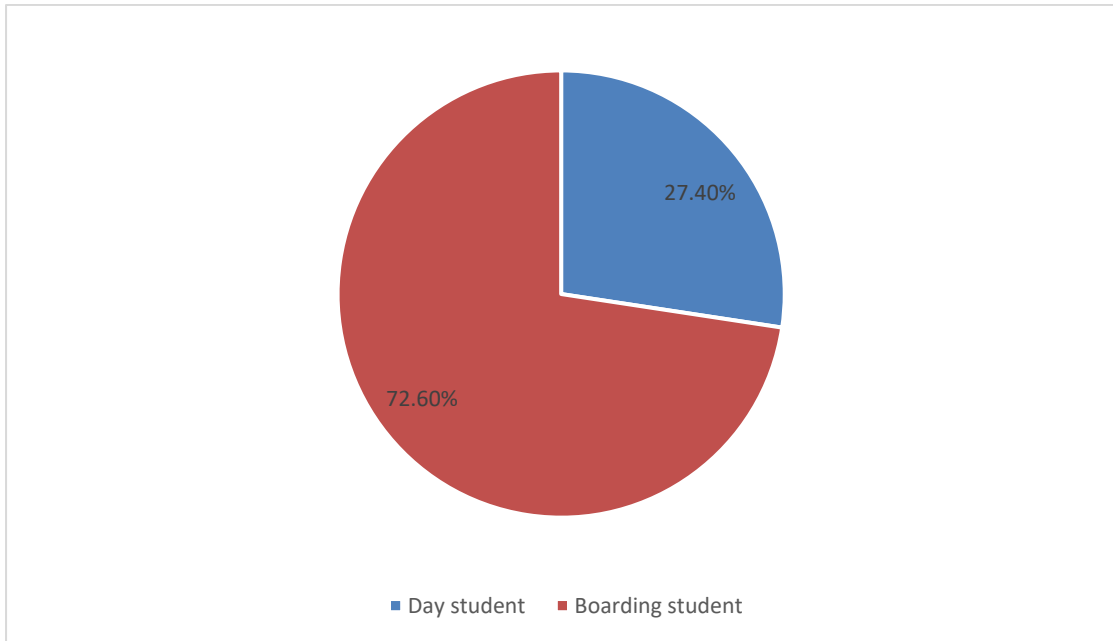
**Figure 4.1: Respondents Academic Qualification**

With regards to the educational qualification of the respondents, results from Figure 4.1 show that nearly 100% of the respondents that is, 98.8% had B.E.C.E as their highest level of academic qualification since most of them have still not completed their senior high school education. However, only 1.2% of the respondents had other forms of academic qualification aside B.E.C.E.



#### 4.2.4 Students School Status

The status of the respondents as to whether they are day or boarding student has been presented in Figure 4.2.

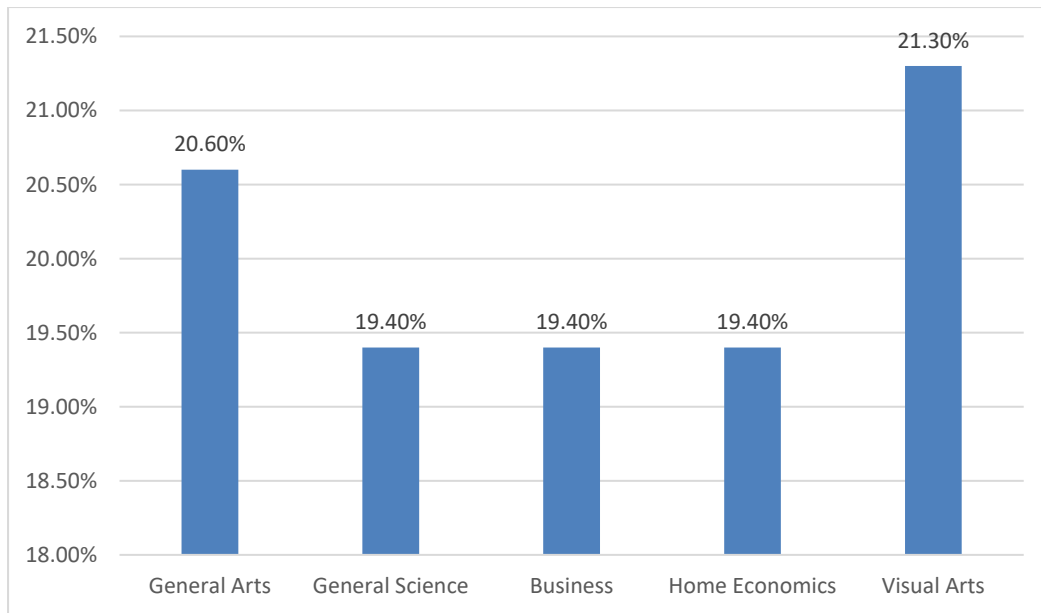


**Figure 4.2: Respondents School Status**

Results from Figure 4.2 show that 72.6% of the students were boarding students with the rest that is, 27.4% being day students in their respective schools.

#### 4.2.5 Programme Read at School

The programme the students read in their respective schools have been presented in Figure 4.3.



**Figure 4.3: Programme the Respondents Read at School**

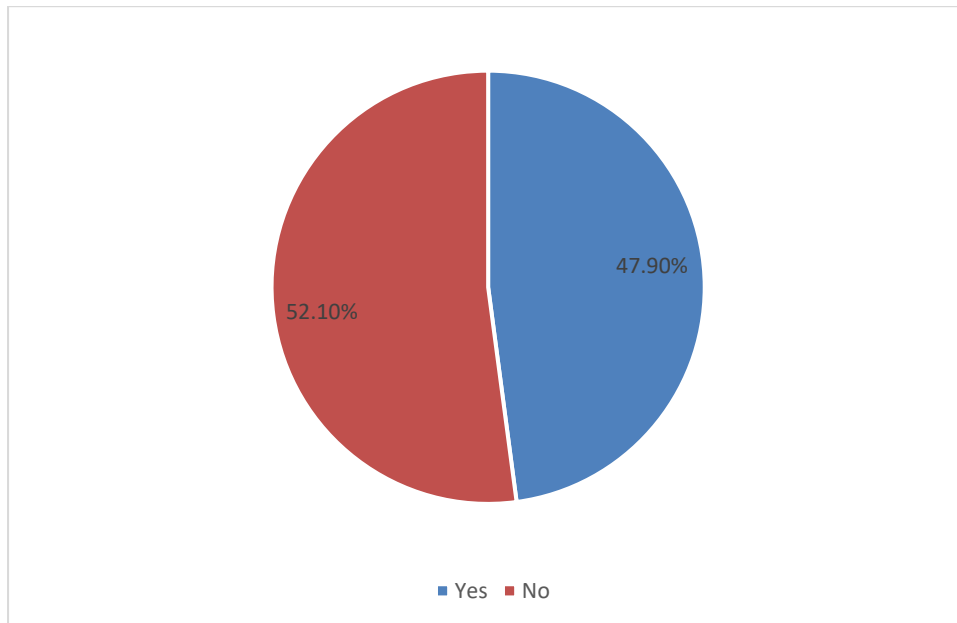
When it comes to the courses the respondents read in their respective schools, it can be observed from Figure 4.3 that 20.6% of the respondents offered general arts, 19.4% on the other hand read general science, business and home economics respectively. Again, 21.3% of the respondents read visual arts within their respective schools. This result goes to suggest that the respondents were fairly distributed across all the five programmes undertaken in the second cycle institutions.

#### **4.3 Breakfast Consumption Habits of Second Cycle School Students**

This objective seeks out to explore the breakfast consumption habits of the understudied senior high school students within the Ashanti Region. Accordingly, a result about the respondents' breakfast consumption habit has been presented in the sub-section of this section.

#### 4.3.1 Frequency of Breakfast Consumption

This item sought to establish the frequency with which the respondents took breakfast before going to class. Accordingly, this item asked the respondents whether they always take breakfast before going to class. A result on this item has been presented in Figure 4.4.



**Figure 4.4: Do you always take breakfast before going to class?**

Apparently, when the respondents were asked whether they always take their breakfast before going to class, it was revealed that most of the respondents said no. Meaning, 52.1% of the respondents said they do not always take their breakfast before going to class. However, to 47.9% of the respondents, they always take their breakfast before going to class each morning. This revelation is somehow encouraging as nearly 50% of the respondents did admit that they always take their breakfast before going to class. With this revelation, the next question sought to find out the kind of meals the respondents frequently took as their breakfast as well as the time they frequently took their breakfast.

**Table 4.3: The Time the Respondents took their Breakfast**

<b>Time Schedule for Breakfast Consumption</b>	<b>Frequency</b>	<b>Percent</b>
Between the hours of 6:00-7:00 am	41	9.9
Between the hours of 7:30-8:30 am	127	30.8
Between the hours of 9:00-10:00 am	223	54.0
Between the hours of 10:30-11:30 am	21	5.1
<b>Total</b>	<b>413</b>	<b>100.0</b>

It can be observed in Table 4.3 that only 9.9% of the respondents took their breakfast meal within the early hours of 6:00am-7:00 am in the morning. However, to 30.8% of the respondents they frequently took their breakfast within the hours of 7:30am-8:30 am. Also, the large part of the respondents that is, 54.0% took their breakfast meal within the hours of 9:00-10:00am. Having more than half of the respondents taking their breakfast within this time range can be largely attributed to time most boarding schools took their breakfast. In most Ghanaian boarding schools, the stipulated time for taking breakfast is within the hours of 9:00am-9:30 am hence, having most of the respondents selecting 9:00-10:00am as the time they often took their breakfast comes as not very surprising since most of them were boarding students. However, only 5.1% of the participants took breakfast above the recommended duration for the consumption of breakfast. With this category of respondents, they took their meal in the hours of 10:30-11:30 am. Results from the study suggest that most of the students were taking their breakfast in cognizant with the recommended time of the US Department of Agriculture where breakfast is stipulated to be taken within the early hours of 6:00am-9:00am (Timlin & Pereira, 2007).

#### **4.3.2 The Time the Respondents took their Breakfast**

As indicated in the literature a meal can be categorized as breakfast when it is taken in the early hours of the day that is between the hours of 6:00-9:00 am in the morning. From this viewpoint, this question seeks out to explore the time with which the

respondents often took their breakfast within each given day. Accordingly, results about the time range with which the participants took their breakfast has been shown in Table 4.4.

#### 4.3.3 The Number of times the Respondents took Breakfast within a Week

This item asked the respondents to recall from last week, the number of days they took breakfast in the morning. Accordingly, results on the number of days the respondents took breakfast in the morning has been presented in Table 4.4.

**Table 4.4: The Number of times the Respondents took Breakfast**

<b>Number of Days</b>	<b>Frequency</b>	<b>Percent</b>
None	32	7.8
For only two days	13	3.2
For only three days	63	15.3
For only four days	16	3.9
For only five days	85	20.6
For only six days	31	7.5
For all the seven days	172	41.7
<b>Total</b>	<b>412</b>	<b>100.0</b>

When the respondents were asked to recall from last week the number of days, they took breakfast, results from Table 4.4 suggest that 7.8% of the respondents did not take any breakfast in all the days of the week. However, 3.2% and 15.3% of the respondents indicated that to them they took their breakfast for only two days and three days respectively. Also, 3.9% and 20.6% of the respondents recalled to have taken their breakfast for four and five days respectively. Moreover, 7.5% and 41.7% of the respondents recalled to have taken breakfast for six and seven days respectively. This suggests that a greater part of the respondents took their breakfast in all the seven days in the week. Interestingly, only 7.8% of the respondents did not

take breakfast in any of the days of the week. Meaning, apart from this number, almost all the respondents took breakfast in some of the days of the week with a little over 41% agreeing to have taken breakfast in all the seven days within the week.

#### 4.3.4 Breakfast Consumption across Genders

This item sought to establish the breakfast consumption pattern across genders (i.e. male and female respondents) to identify whether differences exist between the breakfast consumption patterns of the male and female respondents. Accordingly, the respondents' breakfast consumption patterns with reference to the number of days within the week they took breakfast has been presented in Table 4.5.

**Table 4.5: Breakfast Consumption across Genders**

Breakfast intake recall	Gender		Total
	Male, Freq (%)	Female, Freq (%)	
Once	15(7.7%)	32(14.8%)	47
For only two days	25(12.8%)	8(3.7%)	33
For only three days	35(17.9%)	50(23.1%)	85
For only four days	50(25.5%)	16(7.4%)	66
For only five days	40(20.4%)	47(21.8%)	87
For only six days	20(10.2%)	31(14.4%)	51
For all the seven days	12(6.1%)	32(14.8%)	44
<b>Total</b>	<b>196 (100.0%)</b>	<b>216(100.0%)</b>	<b>413</b>

Results from Table 4.5 suggest that whereas 14.8% of the female respondents took breakfast once a week, 7.7% of the male respondents took breakfast for only once in a week. This suggests that more females skipped their breakfast for close to six days than their male counterparts. Again, it can be observed from Table 4.5 that while 12.8% of the male respondents took their breakfast in two of the days of the week comparatively only 3.7% of the females took their breakfast for two of the days of the week. Also, 17.9% of the male respondents recalled that to them they took breakfast

only three times in a week. Comparatively, 23.1% of the female respondents took breakfast for only three times within the week. Again, whereas 25.5% of the male respondents took breakfast for four times within the week only 7.4% of the female respondents took breakfast for four times within the week. Also, when it comes to the percentage of respondents who took breakfast for five of the days of the week, it can be observed in Table 4.5 that there is a marginal difference between male and female breakfast consumption patterns. For instance, whereas 20.4% of the male respondents took breakfast for five days in the week 21.8% of the females on the other hand took breakfast for five of the days in the week. Last but not the least, 10.2% of the male respondents recalled to have taken breakfast in almost all the seven days within the week. Particularly, 10.2% of the male respondents recalled to have taken breakfast for six (6) days in the week. On the contrary, 14.4% of the female respondents recalled to have taken breakfast for six (6) of the days within the week.

Finally, a small section of the male respondents that is, 6.1% took breakfast for all the seven days within the week. However, with the female counterparts, 14.8% recalled to have taken breakfast in all the seven days of the week. Results from the study suggest that the male breakfast consumption patterns tend to somehow minimal when compared to their female counterparts. For instance, whereas 10.2% of their males took their breakfast for six of the days of week, the female respondents witness some increase as 14.4% of females took their breakfast for six of the days of the week. Again, 14.8% of the female participants took breakfast in all the seven days in the week only 6.1% of the males took breakfast for all the seven days in the week.

#### 4.3.5 Meals taken as Breakfast

With this item, respondents were presented with set of meals for them to select the ones they frequently take as their breakfast. Accordingly, results on the meals the respondents picked or selected as their most preferred breakfast have been presented in Table 4.6.

**Table 4.6: Meals taken as Breakfast**

Meals	Frequency	Valid Percent
Hausa koko with koose	100	24.2
Hausa koko with bread	76	18.4
Tom brown with bread	45	10.9
Oat with milk, bread and egg	65	15.7
Rice water with bread and margarine	40	9.7
Oblayo with milk and bread	12	2.9
Ekuegbemi with bread	5	1.2
Tea with bread and egg	70	16.9
<b>Total</b>	<b>413</b>	<b>100.0</b>

Results from Table 4.6 show that the meal selected by the respondents as their most preferred form of breakfast was ‘Hausa koko’ and ‘koose’. Again, out of the total respondents, 24.2% of them selected this as the meal often taken as their breakfast. ‘Hausa koko’ is a local porridge prepared from food grains such as maize, sorghum and millet. Aside these grains, other spices such as pepper and ginger are added to these grains to get the primary product. This porridge is the most favoured among the Muslim dominated communities and has gradually become one of the most cherished form of delicacies among non-Muslims. However, with ‘koose’, it is prepared from beans and other local spices that are blended together. It is subsequently fried to produce a local doughnut. The ingredients used to produce ‘Hausa koko’ and ‘koose’ makes it one of the highly source of minerals and vitamins hence, having most of the



respondents selecting it as their most favoured form of breakfast hints that the respondents are consuming meals that are filled with sufficient minerals and vitamins. The second food item picked by significant number of the respondents was 'hausa koko' with bread. Also, 18.4% of the respondents picked it as their most preferred form of breakfast. Identifying 'hausa koko' with bread as the second most consumed form of breakfast go to confirm its high patronage in the country. Tea with bread and egg became the third most consumed form of breakfast by the respondents. It was picked by 16.9% of the respondents as their most preferred form of breakfast. Again, oat with milk, bread and egg was identified by 15.7% of the respondents as their most favoured form of breakfast meal.

This suggests that it became the fourth most consumed breakfast meal among the respondents. Tom brown with bread became the next highly consumed breakfast among the respondents. With this meal, 10.9% of the respondents identified it as the meal they often take as their breakfast. However, meals such as 'Oblayo (capital letters)' with milk and bread and 'Ekuegbemi (small letters)' with bread were found to be the least consumed meals by the respondents. Only 2.9% and 1.2% of the respondents respectively picked these meals as their most consumed form of breakfast. Results from the study suggest that the meals usually taken by the respondents as their breakfast are 'hausa koko' with 'koose', 'hausa koko' with bread, Tea with bread and egg and oat with milk, bread and egg. Conversely, meal such as 'Oblayo' with milk and bread and 'maize puddy' with bread became the least form of meal taken by the respondents as their breakfast.

#### 4.4 Specific Factors that lead to student's breakfast Skipping Behaviours

This objective sought to identify the main reasons that accounted for the respondent's inability to take their breakfast in most of the days of the week. Hence, the reasons that restricted the respondents from taking their breakfast in most of the days of the week have been presented in Table 4.7.

**Table 4.7: Specific Factors that lead to student's breakfast Skipping Behaviours**

<b>Reasons</b>	<b>Frequency</b>	<b>Percent</b>
Not feeling hungry for most of the days	160	38.7
Had no money	39	9.4
Late for school/class	17	4.1
Dislike most of the food choices given as breakfast	131	31.7
I skipped most of the breakfast in order not to gain weight	66	16.0
<b>Total</b>	<b>413</b>	<b>100.0</b>

Results from Table 4.7 show that the number one reason that prevented many of the participants (i.e. 38.7%) from taking their breakfast in most of the days of the week was that in most of the times they felt not hungry. The second reason found to have restricted many of the respondents from taking their breakfast was that they dislike most of the food choices given to them as breakfast. Specifically, 31.7% of the respondents identified their dislike for the foods given as one of the main reasons that made it difficult for them to consume their breakfast. The third reason listed by the respondents to have accounted for their non-consumption of most of their breakfast meal was their desire not to gain weight. Meaning, 16.0% of the respondents said they skipped most of the breakfast in the week in order not to gain weight. Even though, issues such as absence of money and the decision not to be late for class formed part of the reasons that restricted the respondents from consuming their breakfast nevertheless, only 9.4% and 4.1% of the respondents respectively listed these factors

the reasons that constrained them from consuming their breakfast in most of the days in the week. Results from the study suggest that issues such as, participants dislike for the foods served, sense of not feeling hungry and the penchant not to gain weight formed the main reasons that constrained the respondents from consuming most of the breakfast served to them.

#### 4.5 Relationship between Breakfast Consumption and Students' Academic Performance

##### Performance

This objective seeks out to assess the impact breakfast intake had on student's academic performance. Specifically, the proxy used to assess the respondent's academic performance was their first term examination score on the following core subjects; Core Mathematics, English Language, Social Studies and Integrated Science. Hence, the respondent's academic performance was dichotomized into two variables; fail and pass. Accordingly, the logistic regression results about the impact breakfast consumption had on student's performance have been presented in under section.

##### 4.5.1 Breakfast Consumption and Respondents Core Mathematics Exams Score

The logistic regression about the impact breakfast intake has on the respondents' core mathematics performance has been presented in Table 4.8.

**Table 4.8: Breakfast Consumption and Core Mathematics Performance**

Predictors	$\beta_i$	S.E.	Wald	Df	Sig.	Exp (B)	95% C.I. Lower	95% C.I. Upper
Breakfast conump.	.730	.226	10.389	1	.001	.482	.309	.751
Constant	.590	.167	12.531	1	.000	.554		

**Note: Cox & Snell R Squared= 0.225, Nagelkerke R Squared = 0.336**

The results of the logistic regression analysis show that breakfast consumption significantly impacted on the respondents' core mathematics performance  $\chi^2 = 468.348$ ,  $df = 1$ ,  $N = 413$  (95% CI 0.31-0.75),  $p < 0.001$ . This hints that the odd for a respondent mathematics performance was higher for breakfast takers than for breakfast skippers. The "pseudo" R estimates indicate that the model explained between 22.5% (Cox & Snell R Squared) and 33.6% (Nagelkerke R Squared) of the variance in the respondents' core mathematics exams score. The Wald statistics value of 10.389 also goes to suggest that the respondent's mathematics score is significantly influenced by breakfast consumption. Specifically, the model correctly predicted 73.4% of breakfast takers mathematics score. Meaning, taking breakfast improved the respondent's mathematics score.

#### 4.5.2 Breakfast Consumption and Respondents English Language Exams Score

The logistic regression about the influence breakfast intake has on the respondents' English Language performance has been presented in Table 4.9.

**Table 4.9: Breakfast Consumption and English Language Performance**

Predictors	$\beta_i$	S.E.	Wald	Df	Sig.	Exp (B)	95% C.I. Lower	95% C.I. Upper
Breakfast. Consump	1.140	.304	14.033	1	.000	3.127	1.722	5.678
Constant	1.324	.196	45.673	1	.000	3.758		

**Note: Cox & Snell R Squared= 0.35, Nagelkerke R Squared = 0.65**

The results of the logistic regression analysis indicate that breakfast consumption significantly influenced the respondents' English Language performance  $\chi^2 = 301.672$ ,  $df = 1$ ,  $N = 413$  (95% CI 1.7-5.6),  $p < 0.001$ . This implies that the odd for a respondent English language performance was higher for breakfast takers than for breakfast skippers. Particularly, the model accurately predicted 87.1% of breakfast

takers English Language performance than breakfast skippers English Language performance. Again, the “pseudo” R estimate which indicates the amount of variation explained in the dependent variable stood at 35% for Cox and Snell R Squared and 65% for Nagelkerke R Squared. Meaning, 35% and 65% in the respondents English Language performance can be shaped by their breakfast consumption. Additionally, the Wald statistics values of 14.033 suggest that breakfast consumption improved the respondents English Language score.

#### 4.5.3 Breakfast Consumption and Respondents Integrated Science Exams Score

The logistic regression on the impact breakfast intake has on the respondents’ Integrated Science Exams score has been presented in Table 4.10.

**Table 4.10: Breakfast Consumption and Respondents Integrated Science Exams Score**

Predictors	$\beta_i$	S.E.	Wald	Df	Sig.	Exp (B)	95% C.I. Lower	95% C.I. Upper
Breakfast conump.	.861	.246	12.236	1	.000	2.366	1.460	3.834
Constant	.850	.174	23.811	1	.000	2.340		

**Note: Cox & Snell R Squared= 0.29, Nagelkerke R Squared = 0.46**

The results of the logistic regression analysis suggest that breakfast consumption significantly impacted on the respondents’ Integrated Science Score  $\chi^2 = 409.808$ ,  $df = 1$ ,  $N = 413$  (95% CI 0.3-0.5),  $p < 0.001$ . This implies that the odds for a respondent Integrated Science score was lower for breakfast skippers than for breakfast takers. Particularly, the model accurately predicted 79.1% of breakfast takers Integrated Science score than breakfast skippers Integrated Science score. Again, the “pseudo” R estimate which indicates the amount of variation explained in the dependent variable stood at 29% for Cox and Snell R Squared and 46% for Nagelkerke R Squared. Meaning, 29% and 46% in the respondents Integrated Science score can be shaped by

their breakfast consumption. Additionally, the Wald statistics value of 12.236 suggest that breakfast consumption improved the respondents integrated science score.

#### 4.5.4 Breakfast Consumption and Respondents Social Studies Score

The logistic regression on the influence breakfast consumption had on the respondents' Social Studies Exams score has been presented in Table 4.11.

**Table 4.11: Breakfast Consumption and Respondents Social Studies Exams**

		Score								
Predictors	$\beta_i$	S.E.	Wald	Df	Sig.	Exp (B)	95% Lower	C.I. Upper	95% Lower	C.I. Upper
Breakfast consump.	.771	.297	16.729	1	.009	2.162	1.207	3.871		
Constant	1.485	.206	52.120	1	.000	4.414				

**Note: Cox & Snell R Squared = 0.16, Nagelkerke R Squared = 0.30**

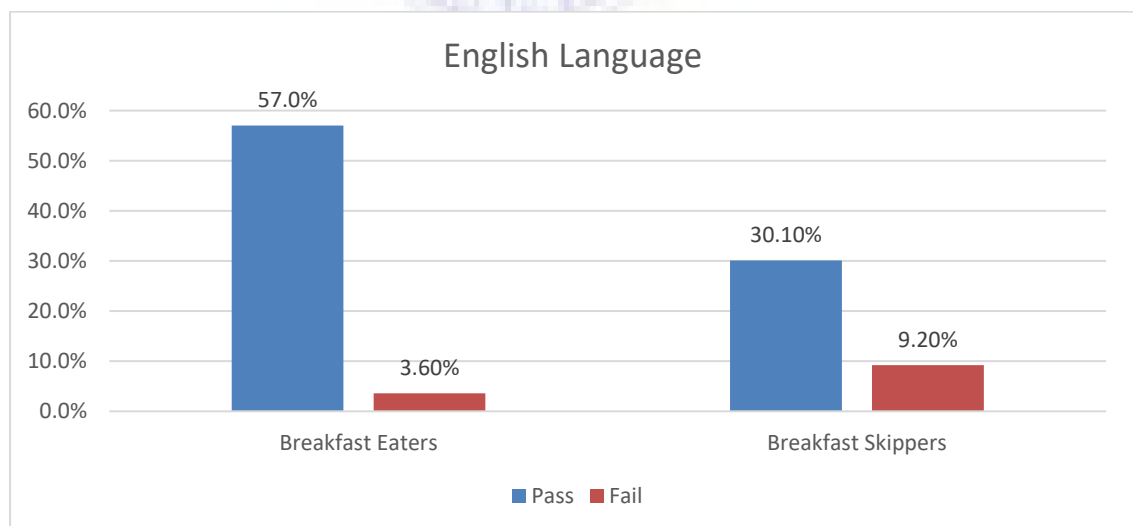
The results of the logistic regression analysis in Table 4.11 suggest that breakfast consumption significantly impacted on the respondents' Social studies score  $\chi^2 = 308.942$ ,  $df = 1$ ,  $N = 413$  (95% CI 0.2-0.3),  $p < 0.001$ . This implies that the odds for a respondent Social Studies score was higher for breakfast takers than for breakfast skippers. Again, the "pseudo" R estimate which indicates the amount of variation explained in the dependent variable stood at 16% for Cox and Snell R Squared and 30% for Nagelkerke R Squared. More so, the Wald statistics value of 16.729 implies that the breakfast consumption improved the respondent's social studies exams. Specifically, the model correctly predicted 87.1% of breakfast takers social studies score.

#### 4.6 Comparing of Student’s Academic Achievement between Breakfast Skippers and Breakfast Takers

After establishing that consumption of breakfast has a significant influence on the respondent’s performance in areas such as core mathematics, English language, Social studies and Integrated Science, this objective sought to establish whether significant differences existed between the academic scores of breakfast takers and skippers. Moreover, as indicated earlier, the respondent’s academic performance was dichotomized into two variables; fail and pass. Meaning, students whose score fall within the mark of 50-100% were coded as pass whereas those whose score fall below 50% were coded as fail. Accordingly, the results about the differences in the academic scores of breakfast skippers and takers have been presented in the sub-sections of this section.

##### 4.6.1 Breakfast Takers and Skippers English Language Exams Score

Results on the respondents score on English Language among breakfast takers and skippers have been presented in Figure 4.5.



**Figure 4.5: Breakfast Takers and Skippers Score in English Language**

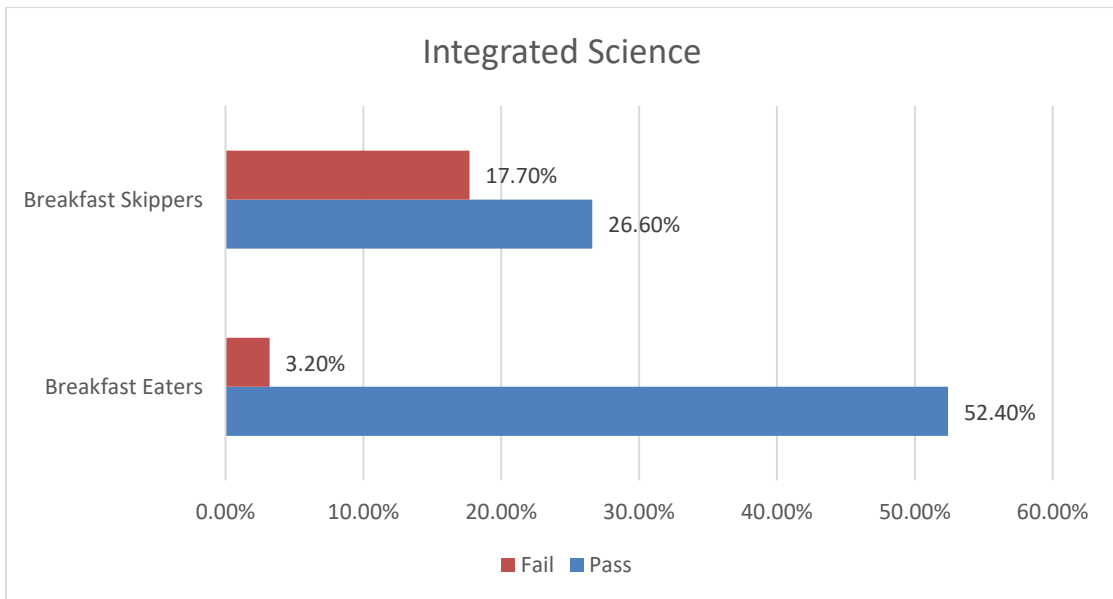
Results from Figure 4.5 suggest close to 60% of the respondents who took breakfast regularly passed their English Language exam. Meaning, this segment of the respondents obtained the WASSCE pass mark of 50-100%. Comparatively only 30.1% of the respondents who skipped breakfast obtained the required pass mark of 50-100%. This suggests that taking breakfast regularly increased the respondent's chances of passing their English Language exams. Again, it can be argued that a large section of breakfast takers passed their English Language exams than breakfast skippers.

However, when it comes to those who failed their English Language exams, it can be observed from Figure 4.5 that only 3.6% of breakfast takers failed their English language paper as compared to 9.2% of breakfast skippers who failed in their English language exams. This result suggests breakfast skippers had lower chances of passing their English Language exams than breakfast takers. Again, failing in this context means that these respondents English Language score fell below 50%. Results from the study suggests that taking breakfast increased the respondent probability of passing their English Language exams than skipping breakfast.

#### **4.6.2 Breakfast Takers and Skippers Integrated Science Exams Score**

Results on the respondents score on Integrated Science among breakfast takers and skippers have been presented in Figure 4.6.



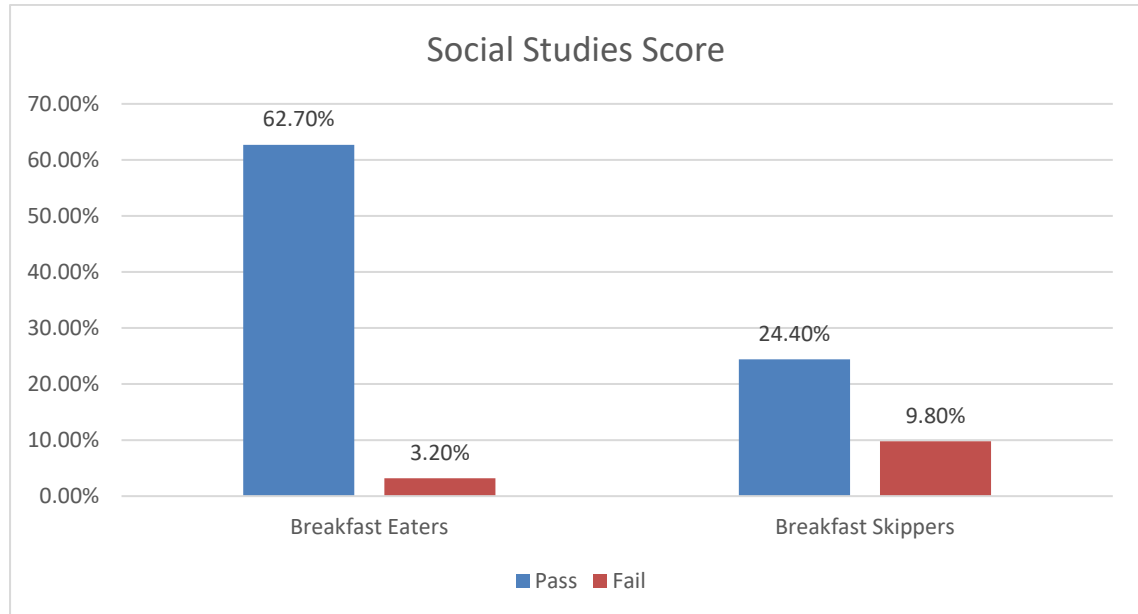


**Figure 4.6: Breakfast Takers and Skippers Integrated Science Score**

Results from Figure 4.6 show that whereas 52.4% of the breakfast takers passed their Integrated Science exams, only 26.6% of breakfast skippers were able to pass their Integrated Science exams. This means that more breakfast takers passed their Integrated Science exams than that of breakfast skippers. Again, this implies that 52.4% of breakfast takers Integrated Science exams score fall within the mark of 50-100%. Comparatively, only 26.6% of breakfast skippers Integrated Science exams score fall within the pass mark of 50-100%. What this suggests is that taking breakfast regularly increase a student's chances of passing their integrated science exams. Moreover, when it comes to respondents whose Integrated Science exams score fall below 50% that is the fail mark, it can be observed in Figure 4.6 only few of the breakfast takers that is, 3.2% failed in their Integrated Science exams. In contrast, close to 20% of breakfast skippers that is, 17.7% failed in their Integrated Science exams. What this result suggests is that breakfast takers had an increased chance of passing their Integrated Science exams than that of breakfast skippers.

#### 4.6.3 Breakfast Takers and Skippers Social Studies Exams Score

Results on the respondents score on Social Studies among breakfast takers and skippers have been presented in Figure 4.7.



**Figure 4.7: Breakfast Takers and Skippers Social Studies Score**

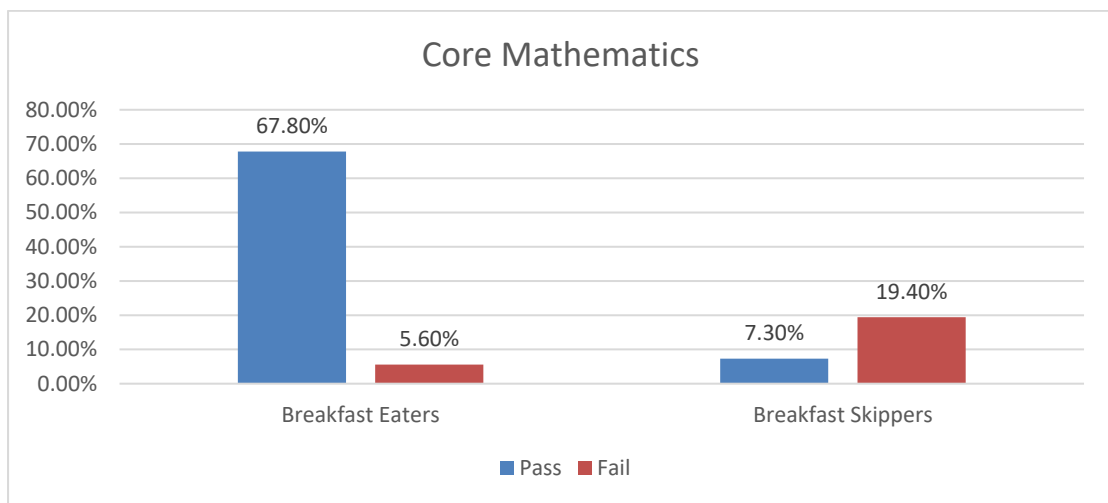
Results from Figure 4.7 reveal that 62.7% of breakfast takers passed their Social studies exams by obtaining the mark within the range of 50-100%. In comparison, only, 24.4% of breakfast skippers were able to obtain the pass mark of 50-100%. This suggests that more breakfast takers passed their social studies exams than breakfast skippers. This result also goes to suggest that taking breakfast increased a student chances of passing their social studies exams.

Nevertheless, when it comes to those who failed in their Social studies exams, it can be observed from Figure 4.7 that only 3.2% of breakfast takers failed in their Social studies exams when compared to 9.8% of breakfast skippers who failed in their Social studies exams. This implies that 3.2% of breakfast takers failed to obtain the pass mark of 50% whereas 9.8% of breakfast skippers also failed to obtain the pass mark

of 50% and above. This suggests breakfast skippers had lower chances of passing their Social studies exams than that of breakfast takers.

#### 4.6.4 Breakfast Takers and Skippers Core Mathematics Exams Score

Results on the respondents score on Core mathematics among breakfast takers and skippers have been presented in Figure 4.8.



**Figure 4.8: Breakfast Takers and Skippers Core Mathematics Score**

When it comes to the respondents' core mathematics examination score, results from Figure 4.8 suggest that whereas 67.8% of the breakfast takers passed their core mathematics score, only 7.3% of breakfast skippers were able to pass their core mathematics exams. This suggests that students who took their breakfast regularly performed better in their core mathematics exams than those who skipped their breakfast. This revelation goes to suggest that taking breakfast increased a respondent probability of passing their core mathematics exams.

Again, when it comes to the respondents who failed in their core mathematics, it can be observed in Figure 4.8 that comparatively more breakfast skippers failed in their core mathematics exams than that of breakfast takers. For instance, whereas 5.6% of

breakfast takers failed in their core mathematics exams, nearly 20% of breakfast skippers failed to obtain the pass mark of 50-100%. Likewise, what this result suggests is that skipping breakfast lowered one chances of passing their core mathematics exams.



## CHAPTER FIVE

### DISCUSSION OF RESULTS

#### 5.1 Introduction

This chapter discusses the results presented in chapter four. Accordingly, how the results align with previous studies as well as the new dimension this result bring to bear to the existing literature has been presented in this chapter.

#### 5.2 Breakfast Consumption Habits of Second Cycle School Students

This objective seeks out to examine the breakfast consumption habits of the understudied senior high school students within the Ashanti Region. On this objective, it was observed that a little over half of the respondents always took their breakfast before going to class. Meaning, 47.9% of the respondents did not always take their breakfast before going to class each morning. However, when it comes to the time the respondents often took their breakfast, it was established that a little over of the respondents took their breakfast meal within the hours of 9:00am-10:00am. Interestingly, only a small section of the participants took their breakfast above the recommended time schedule of 6:00am-10:00am. Specifically, this category of respondents took their breakfast in the hours of 10:30-11:30 am. What this result means is that most of the students were taking their breakfast in cognizant with the recommended time that is, within the early hours of 6:00am-9:00am in the morning. Again, when it came to the number of days the respondents took their breakfast, nearly half of the respondents took their breakfast for six and seven days respectively. More so, when it comes to the meals selected by the respondents as their breakfast, most of the respondents selected hausa koko with koose, hausa koko with bread, tea

with bread and egg and oat with milk, bread and egg as the meals taken by them as breakfast. However, other beverages such as Oblayo with milk and bread and maize puddy were selected by only a small section of the respondents. Even though, the foods selected by the respondents for their breakfast came from grains, low fat dairy products and legumes, nevertheless, most of their breakfast meals failed to include other rich food nutrients such as fruits, vegetables, lean meats, and nuts. As indicated by the US Department of Agriculture, a breakfast meal should be made up of foods from at least two of the following food groups namely; grains, low fat dairy products, fruits, vegetables, lean meats, and finally nuts, seeds, and legumes (Lauren et al., 2012) hence, not having most of the respondents breakfast meal meeting all these nutritional requirements could predispose them to some sort of nutritional deficiency. Again, it has to be pointed out that only a few of the respondents took their breakfast within the hours of 10:30-11:30 am, this hints that the time most of the respondents took their breakfast was in line with the standard agreed time of 6:00-9:00am (Timlin & Pereira, 2007; Khani & Soleimani, 2011).

Moreover, results from this study is not very different from the work of Karimi et al. (2008) as in their work it became evident that nearly 53.4% of the pupils consumed breakfast at all times in the week with only 4.6% failing to consume their breakfast in most of the days of the week. Particularly, in this study, 41% of the respondents took their breakfast in all the days of the week with 7.8% of them failing to take their breakfast in all the days of the week.

Again, a result from this study suggests that primary school students in Riyadh took more breakfast than what is found in this study. For instance, in the study of Turki et al. (2019) it was observed that 60% of the selected primary school children in Riyadh

took breakfast in more than four times in a week. However, in this study, it was established that only 3.9% of the respondents took breakfast for four times in the week. Likewise, results in this study suggest that more students within the age cohort of 15-19 years in Abu Dhabi took breakfast regularly than students in Ghana. Specifically, in the study of Taha and Rashed (2017), it was observed that 62% students in Abu Dhabi took their breakfast everyday. However, as found in this study only 41% of the respondents in this study took their breakfast in all the days of the week. Lastly, findings from this study contradict the earlier results of Ackuaku-Dogbe and Abaidoo (2014) whose work revealed that only 28.08% of the medical students studying at the University of Ghana Medical School, Korle Bu-Accra were taking breakfast regularly. Particularly, in this study it was observed that 41% of the respondents took their breakfast in all the days of the week.

### **5.3 Specific Factors that Lead to Student's Breakfast Skipping Behaviours**

This objective sought to identify the main reasons that restricted the respondents from taking their breakfast on the daily basis. Specifically, on this objective, it was established that the number one reason that prevented many of the participants from taking their breakfast in most of the days of the week was that in most of the times they felt not hungry. The second reason found to have restricted many of the respondents from taking their breakfast was that they dislike most of the food choices given to them as breakfast. The third reason listed by the respondents to have accounted for their non-consumption of most of their breakfast meal was their desire not to gain weight.

Even though, issues such as absence of money and the decision not to be late for class formed part of the reasons that restricted the respondents from taking their breakfast nevertheless, only small section of the respondents respectively listed these factors the reasons that constrained them from consuming their breakfast in most of the days in the week. Results from the study suggest that issues such as, participants dislike for the foods served, sense of not feeling hungry and the penchant not to gain weight formed the main reasons that constrained the respondents from consuming most of the breakfast served to them.

Reasons given by the respondents tend not to be very different from the ones reported in the study of Taha and Rashed (2017) as their results identified issues such as children dislike for the meals served to them as breakfast, the perception that taking breakfast always will increase their body weight and lack of money form the main reasons that prevent most adolescents from taking their breakfast on the daily basis. Likewise, results from this study affirm the earlier work of Javaid and Munir (2018) as their study came to the conclusion that issues such as the fear of getting late to class, not being hungry enough or dislike for the meals served as breakfast constituted the main reasons that prevented many medical students from taking their breakfast. Again, the factors identified in this study to have restricted the respondent's regular intake of breakfast happen not to be very different from the conclusions of Intiful and Lartey (2014) as issues such as lack of food at home, lack of money and dislike for the meals served as breakfast formed the main reasons that prevented most of students from taking their breakfast.



#### **5.4 Relationship between Breakfast Consumption and Students' Academic Performance**

This objective seeks out to assess the relationship between breakfast consumption and student's academic performance. On this objective, the proxy used to assess the respondent's academic performance was their first term examination score on the following core subjects; Core Mathematics, English Language, Social Studies and Integrated Science.

When it comes to the impact breakfast consumption had on the respondents' academic score, results from logistic regression show that breakfast consumption significantly improved the respondents core mathematics, English language, social studies and integrated science performance  $p < 0.001$ . This suggests that the odds for a respondent on these core subjects were higher for breakfast takers than for breakfast skippers.

Results from this study suggest that students who took breakfast regularly had better chance of scoring better grade on Core Mathematics, English Language, Social Studies and Integrated Science than breakfast skippers. Results from the study affirm the earlier works of Turki et al. (2019) as their work observed that students who consumed breakfast regularly obtained higher scores in mathematics (78%), science (87%), and Arabic language (98%) than those who skipped breakfast. Again, results from this study corroborate the works of kawafha (2013) and that of Taha and Rashed (2017) as their work observed that students who took breakfast regularly performed better than those who skipped breakfast. Again, results from this study affirm the work of Imberman and Kugler (2014) as their study observed that students who took breakfast before going to school recorded a substantial improvement in their reading

and math test scores than students who skipped breakfast. Additionally, results from the study is consistent with the views of Javaid and Munir (2018) and that of Lundqvist et al. (2019) as their results found out that breakfast takers score higher in areas such as mathematics, English language and science related courses than breakfast skippers. Moreover, the significant relationship reported between breakfast intake and students academic performance can be attributed to these reasonings. According to Feldman and Barshi (2007), taking meals in the early hours of the day increases the glucose level of the individual which at the end improves a person cognition functioning ability. However, the contrary holds to breakfast skippers since skipping breakfast limits an individual level of blood glucose resulting into a condition called hypoglycemia (Perlmutter et al., 2008). As indicated by Perlmutter et al. (2008), hypoglycemia conditions trigger uneasiness, fatigue, confusion, and slowed mental functions hence, affecting the cognitive function and mental attentiveness of breakfast skippers in class.

Grima, Pase, Macpherson and Pipingas (2012) on their part linked the relationship between breakfast intake and academic performance to the essential vitamins and minerals that are found in most breakfast meals such as milo, oat, egg, wheat, tombrown, etc. According to Grima et al. (2012) the essential minerals and vitamins in these meals supply the consumer necessary energy that are critical for their cognitive functioning. These reasonings suggest that failing to take breakfast in the morning could restrict a student body from acquiring the necessary vitamins and minerals needed to energize their cognitive abilities.

### **5.5 Comparing Student's Academic Achievement between Breakfast Skippers and Breakfast Takers**

This objective seeks out to compare the academic performances of breakfast takers against that of breakfast skippers to identify whether significant difference exist in their exams score on subjects such as, English language, Social studies and Integrated Science. Apparently, on this objective, it was observed that 57% of the respondents who took breakfast regularly passed their English Language exam. Comparatively only 30.1% of the respondents who skipped breakfast obtained the required pass mark of 51-100%. However, when it came to those who failed their English Language exams, results from the study suggest that only 3.6% of breakfast takers failed their English language exams compared to 9.2% of breakfast skippers. This suggests breakfast skippers had lower chances of passing their English Language exams than that of breakfast takers.

Again, results from the study point out that whereas 52.4% of breakfast takers passed their Integrated Science exams only 26.6% of the breakfast skippers were able to pass their Integrated Science exams. This indicates that more breakfast takers passed their Integrated Science exams than that of breakfast skippers. Moreover, when it comes to the respondents whose Integrated Science exams score fall below 50% that is, the fail mark, results from the study suggest that only few of the breakfast takers that is, 3.2% failed in their Integrated Science as compared to 17.7% of breakfast skippers. What this result suggests is that breakfast takers had an increased chance of passing their Integrated Science exams than that of breakfast skippers.

When it comes to Social Studies, results from the study point out that whereas 62.7% of breakfast takers passed their Social studies comparatively, only, 24.4% of breakfast skippers were able to obtain the pass mark of 50-100%. This suggests that more breakfast takers passed their social studies exams than breakfast skippers. However, when it comes to those who failed in their Social studies exams, results from the study suggest more breakfast skippers failed in their social studies exams than that of breakfast takers. For instance, whereas 3.2% of breakfast takers failed in their social studies close to 10% of breakfast skippers that is, 9.8% failed in their social studies exams. This suggests that breakfast skippers had lower chances of passing their social studies exams than that of breakfast takers.

Also, when it comes to the respondents' core mathematics examination score, results from the study suggest that whereas 67.8% of the breakfast takers passed their core mathematics exams, only 7.3% of breakfast skippers were able to pass their core mathematics exams. This suggests that students who took their breakfast regularly performed better in their core mathematics exams than those who skipped their breakfast. Again, when it comes to the respondents who failed in their core mathematics, results from the study hint that comparatively more breakfast skippers failed in their core mathematics exams than that of breakfast takers. For instance, whereas 5.6% of breakfast takers failed in their core mathematics exams, nearly 20% of breakfast skippers failed to obtain the pass mark of 50-100%. Results from this study suggests that comparatively breakfast takers performed better in all the core subjects than those who skipped taking their breakfast.

Results produced in this study align with the conclusions made in the study of Lundqvist et al. (2019) as their work reported a significant difference between the academic performance of breakfast takers and skippers. Particularly, in their case, students who took regular breakfast recorded substantial scores in their grade point average than those who skipped breakfast. Likewise, in this study students who took breakfast regularly scored high in all the four core subjects than those who skipped their breakfast. Also, results from this study affirm the work of Taha and Rashed (2017) as in their study a significant difference was reported between the academic performance of breakfast skippers and takers. Again, results established in this study support the claims of Javaid and Munir (2018) as their results observed that breakfast takers witnessed a significant gains in their academic score than that of breakfast skippers.

However, results from this study is inconsistent with the work of Mhurchu et al. (2013) as their work found no significant differences in the academic scores of breakfast takers and skippers. Again, findings from this study could not affirm the claims of Corcoran et al. (2015) as in their case too an insignificant difference was found between the academic performance of breakfast takers and breakfast skippers. Again, results from this study could not corroborate the results of McEwan (2013) as their study recorded no significant difference in the academic performance of breakfast takers and breakfast skippers. Lastly, results from this study could not affirm the conclusions by Leos-Urbel et al. (2013) and that of Turki et al. (2019) as in their respective studies an insignificant difference was observed between the academic scores of breakfast takers and skippers.

## CHAPTER SIX

### SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

#### 6.1 Introduction

This chapter deals with the summary of the main findings of the study. The chapter is structured along the study summary, conclusions and recommendations drawn from the study conclusions.

#### 6.2 Summary of Findings of the Study

The key findings of the study have been presented in accordance with the objectives. Accordingly, the summary of the key findings has been presented under this section.

##### 6.2.1 Breakfast Consumption Habits of Ghanaian Second Cycle School Students

On this objective, it was observed that 52.1% of the respondents did not always take breakfast before going to class. Meaning, it was only 47.9% of the respondents who always took their breakfast before going to class each morning. What this result suggests is that, a little over half of the respondents did not always take their breakfast before going to class in the morning. However, when it comes to the duration the respondents often took their breakfast, results from the study suggest that 9.9% of the respondents took their breakfast within the early hours of 6:00am-7:00am in the morning. 30.8% on the other hand, took their breakfast within the hours of 7:30am-8:30 am. Also, more than half of the respondents that is, 54.0% took their breakfast meal within the hours of 9:00am-10:00am. Again, results from the study suggest that only 5.1% of the participants took their breakfast beyond the recommended time

schedule of 6:00am-10:00am. Specifically, this category of respondents took their breakfast in the hours of 10:30-11:30 am.

Again, when it comes to the meals often taken by the respondents as their breakfast, it was established that meals such as hausa koko with koose, hausa koko with bread, tea with bread and egg and oat with milk, bread and egg formed the main meals often taken by most of the respondents as their breakfast. However, other beverages such as Oblayo with milk and bread and Ekuegbemi with bread became the least form of meal taken by the respondents as their breakfast.

### **6.2.2 Specific Factors that lead to Student's Breakfast Skipping Behaviours**

Under this objective, results from the study showed that issues such as, participants dislike for the foods served, sense of not feeling hungry, the perception that eating breakfast could increase a person weight and lack of money constituted the main reasons that restricted most of the respondents from taking breakfast on a regular basis.

### **6.2.3 Relationship between Breakfast Consumption and Students' Academic Performance**

On this objective, results from the study revealed that breakfast consumption had a significant influence on core mathematics scores  $\chi^2 = 468.348$ ,  $df = 1$ ,  $N = 413$  (95% CI 0.31-0.75),  $p < 0.001$ . Likewise, it was observed that breakfast consumption significantly impacted on breakfast takers English Language scores than breakfast skippers  $\chi^2 = 301.672$ ,  $df = 1$ ,  $N = 413$  (95% CI 1.7-5.6),  $p < 0.001$ . Also, it was established that breakfast consumption significantly impacted on the respondents' Integrated Science Score  $\chi^2 = 409.808$ ,  $df = 1$ ,  $N = 413$  (95% CI 0.3-0.5),  $p < 0.001$ .

Again, it was revealed that breakfast consumption significantly impacted on the respondents' Social studies score  $\chi^2 = 308.942$ ,  $df = 1$ ,  $N = 413$  (95% CI 0.2-0.3),  $p < 0.001$ .

#### **6.2.4 Comparing Student's Academic Achievement between Breakfast Skippers and Breakfast Takers**

Under this objective, it was established that 57% of the respondents who took breakfast regularly passed their English Language exam. Comparatively only 30.1% of the respondents who skipped breakfast obtained the required pass mark of 51-100%. This suggests breakfast skippers had lower chances of passing their English Language exams than that of breakfast takers.

Also, it was established that whereas 52.4% of breakfast takers passed their Integrated Science exams only 26.6% of the breakfast skippers were able to pass their Integrated Science exams. Again, when it comes to the respondents whose Integrated Science exams score fall below 50% that is, the fail mark, results from the study suggest that only few of the breakfast takers that is, 3.2% failed in their Integrated Science as compared to 17.7% of breakfast skippers.

Additionally, it was established that while 62.7% of breakfast takers passed their social studies exams, only 24.4% of breakfast skippers were able to obtain the pass mark of 50-100%. This suggests that more breakfast takers passed their social studies exams than breakfast skippers. Again, it was established that more breakfast skippers failed in their social studies exams than breakfast takers. For instance, whereas 3.2% of breakfast takers failed in their social studies close to 10% of breakfast skippers that is, 9.8% failed in their social studies exams.



Finally, when it comes to core mathematics, it was revealed that whereas 67.8% of the breakfast takers passed their core mathematics exams, only 7.3% of breakfast skippers were able to pass their core mathematics exams. Again, when it comes to the respondents who failed in core mathematics, it was established comparatively more breakfast skippers failed in their core mathematics exams than that of breakfast takers. For instance, whereas 5.6% of breakfast takers failed in their core mathematics exams, nearly 20% of breakfast skippers failed to obtain the pass mark of 50-100%.

### **6.3 Conclusions**

Results from the study revealed that a significant part of respondents that is, 54.0% took their breakfast within the recommended time schedule of 6:00 am to 10:00 am. Meaning, only a small section of the regular breakfast takers took their breakfast above the recommended time schedule of 6:00am-10:00am. Again, findings from the study suggest that regularly taking breakfast did not only improved the participants performance in subjects such as, core mathematics, English language, social studies and integrated science but it equally minimized their failing rate.

Finally, with regards to the main factors that prevented the participants from taking their breakfast issues such as dislike for the meals served as breakfast, sense of not feeling hungry, the perception that eating breakfast could increase a person weight and lack of money formed the main reasons that restricted most of the respondents from taking breakfast on a regular basis.

#### **6.4 Recommendations**

The following recommendations are made are based on the major findings and conclusions of the study:

Results from the study revealed that taking breakfast did not only improve the participants exams score in core mathematics, English language, social studies and integrated science but it equally reduce the failing rate of breakfast takers. On this score, it is recommended to the various schools to do well to encourage all their students particularly their boarding students to take their breakfast regular since taking it regularly will improve their cognitive abilities and academic performance.

Again, it was established that most of the respondents skipped their breakfast mainly because they dislike most of the meals served to them as breakfast. Since, taking breakfast on a regular basis has been found to have a positive influence on students' academic performance, it equally becomes prudent to have a variety in the meals served to the students or if possible take feedback from the students with regards to the meals they will prefer to be served to them as their breakfast since this approach can in any way increase the students intake of breakfast.

Likewise, it was revealed that the perception that eating breakfast could increase a person weight constituted one of the main reasons that prevented most of the participants from taking their breakfast on a regular basis. As this perception has been proven to be untrue since extensive studies have shown how continuous intake of breakfast does help in minimizing a person susceptibility to obesity (Tin et al., 2011; Levin et al., 2012; Sakurai et al., 2017), it becomes important for the schools to educate their students on how continuous intake of breakfast could help them improve their body weight.

Last but not the least, it was released that issue of lack of money to buy food was identified as one of the main reasons that prevented most students from taking their breakfast. Accordingly, it is recommended to the government particularly the Ministry of Education to have breakfast included to the current free meals provided to all senior high students under the free senior high school policy since providing free breakfast meals to the students will not only increase breakfast intake among senior high school students but will equally help students to acquire all the necessary energy required to make their body function to the optimal level.

Lastly as this study was solely interested in looking at how breakfast intake influence senior high school students academic performance, it equally becomes important for other studies to look at how other cofounding variables such as regularity of breakfast consumption, content of breakfast meal, physical activity, education background of the parents and parents socio-economic status moderate the relationship between breakfast intake and students academic achievement.

## REFERENCES

- Aaslid, R., Huber, P., & Nornes, H. (1984). Evaluation of cerebrovascular spasm with transcranial Doppler ultrasound. *J Neurosurg*, *60*, 37–41.
- Acham, H., Kikafunda, J., Malde, M., Oldewage-Theron, W., & Egal, A. (2012). Breakfast, midday meals and academic achievement in rural primary schools in Uganda: implications for education and school health policy. *Food & Nutrition Research*, *56*(1), DOI: 10.3402/fnr.v56i0.11217, 1-13.
- Acham, H., Kikafunda, J., Malde, M., Oldewage-Theron, W., & Egal, A. (2012). Breakfast, midday meals and academic achievement in rural primary schools in Uganda: implications for education and school health policy. *Food & Nutrition Research*, *56*(1), 112-17.
- Ackuaku-Dogbe, E. M., & Abaidoo, B. (2014 ). Breakfast Eating Habits Among Medical Students. *Ghana Medical Journal*, *48*(2), 66-70.
- Adolphus, K., Lawton, C., & Dye, L. (2013). The effects of breakfast on behavior and academic performance in children and adolescents. *Front Hum Neurosci.*, *7*(1), 1-28.
- Adolphus, K., Lawton, C., Champ, L., & Dye, L. (2016). The effects of breakfast and breakfast composition on cognition in children and adolescents: A systematic review. *Adv Nutrit*, *7*(3), 590S–612S.
- Al Turki, M., Al Shloi, S., Al Harbi, A., Al Agil, A., Philip, W., & Qureshi, S. (2018). Breakfast consumption habits among schoolchildren: A cross-sectional study in Riyadh, Saudi Arabia. *International Research Journal of Medicine and Medical Sciences* *6*(2), 50-5.

- Alavi, S., Jazayeri, S., Banaem, N., Afrooz, G., & Behboodi, A. (2000). The effects of taking snacks on the learning ability and educational achievement of elementary school children. *Tehran Univ Med J*, 58(1), 38-44.
- Allen, S. (2012). Theory of food” as a neurocognitive adaptation. *American Journal of Human Biology*. <https://doi.org/10.1002/ajhb.22209>, 1-15
- Álvarez-Bueno, C., Martínez-Vizcaíno, V., López, E., Visier-Alfonso, M., Redondo-Tébar, A., & Cavero-Redondo, I. (2019). Comparative Effect of Low-Glycemic Index versus High-Glycemic Index Breakfasts on Cognitive Function: A Systematic Review and Meta-Analysis. *Nutrients*, 1(1706); doi:10.3390/nu11081706, 1-13.
- Ajzen, I. (2012). *Handbook of Theories of Social Psychology*. SAGE, 1.
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control and the theory of planned behavior. *Journal of Applied Social Psychology*, 32, 665–683. doi:10.1111/j.1559-1816.2002.tb00236.x
- Ajzen, I. (1991). *Attitudes, personality and behaviour*. Milton Keynes: Open University Press.
- Astbury, N., Taylor, M., & Macdonald, I. (2011). Breakfast Consumption Affects Appetite, Energy Intake, and the Metabolic and Endocrine Responses to Foods Consumed Later in the Day in Male Habitual Breakfast Eaters. *J Nutr.*, 141(7), 1381–1389.
- Anzman-Frasca, S., Djang, H.C., Halmo, M.M., Dolan, P.R. (2015). Economos CD. Estimating impacts of a breakfast in the classroom program on school outcomes. *JAMA Pediatr.* 169(1):71-7. doi: 10.1001/jamapediatrics.2014.2042. PMID: 25420110.

- Babbie, E. (2004). *The Practice of Social Research*. Belmont, CA: Thomson/Wadsworth
- Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational behavior and human decision processes*, 50(2), [http://dx.doi.org/10.1016/0749-5978\(91\)90022-L](http://dx.doi.org/10.1016/0749-5978(91)90022-L), 248-287.
- Bellisle, F. (2004). Effects of diet on behaviour and cognition in children. *British Journal of Nutrition*, 92(2), S227–S232.
- Brombach, C. (2001). Meal patterns of women over 65 years; in Butijn CAA, et al (eds): *Changes at the Other End of the Chain*. Maastricht, Shaker, 2002, 49–57.
- Brown, J. L., Beardslee, W. H., & Prothrow-Stith, D. (2008). *Impact of school breakfast on children's health and learning: An analysis of the scientific research*. Retrieved from the Sodexo Foundation website: [http://www.sodexofoundation.org/hunger\\_us/Images/Im](http://www.sodexofoundation.org/hunger_us/Images/Im).
- Bruening, M., Larson, N., Story, M., Neumark-Sztainer, D., & Hannan, P. (2011). Predictors of adolescent breakfast consumption: Longitudinal findings from project EAT. *J Nutr Educ Behav*, 43, 390-5.
- Bryman, A. (2012). *Social Research Method*. New York: Oxford University Press Inc.
- Burrows, T., Goldman, S., Olson, R.K., & Byrne, B. (2017). Associations between selected dietary behaviours and academic achievement: A study of Australian school aged children. *Appetite*, 116, 372-380. doi: 10.1016/j.appet.2017.05.008.

- Chan, K., & Tsang, L. (2011). Promote healthy eating among adolescents: A Hong Kong study. *J Consum Mark.*, 28(5), 354-62.
- Chugani, H. (1998). A critical period of brain development: studies of cerebral glucose utilization with PET. *Prev Med*, 27, 184–188.
- City Population Mapping (2019). *Ashanti Region in Ghana*.  
[https://www.citypopulation.de/en/ghana/admin/06\\_\\_ashanti/?mode=density&map=osm\\_dlr&opacity=0.8](https://www.citypopulation.de/en/ghana/admin/06__ashanti/?mode=density&map=osm_dlr&opacity=0.8) Accessed on 26/05/2020.
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research Methods in Education, Sixth edition*. London: Taylor & Francis Group.
- Cooper, S., Bandelow, S., & Nevill, M. (2011). Breakfast consumption and cognitive function in adolescent school children. *Physiol Behav*, 103, 431-9.
- Cook, T., Ohri-Vachaspati, P. & Leitch, K.G. Evaluation of a Universally-Free School Breakfast Program Demonstration Project: Central Falls, Rhode Island. Evaluation of a Universally-Free School Breakfast Program Demonstration Project: Central Falls, Rhode Island.
- Conner, M.T., Hugh-Jones, S. & Berg, C. M. (2011). Using the two-factor Theory of Planned Behaviour to predict adolescent breakfast choices. *Educational and Child Psychology* 28(4), 37-50.
- Corcoran, S., Elbel, B., & Schwartz, A. ( 2015). *The Effect of Breakfast in the Classroom on Obesity and Academic Performance: Evidence from New York City, Working Paper #02-15*. New York: NYU's Steinhardt School of Culture, Education, and Human Development and Robert F. Wagner School of Public Service.

- Coulthard, J.D., Palla, L. & Pot, G.K. (2017). Breakfast consumption and nutrient intakes in 4-18-year-olds: UK National Diet and Nutrition Survey Rolling Programme (2008-2012). *Br J Nutr.* 118(4), 280-290. doi: 10.1017/S0007114517001714. Epub 2017 Aug 17.
- Creswell, J. (2014). *Research design: Qualitative, Quantitative, and Mixed Methods Approaches*. Los Angeles: SAGE Publications Ltd.
- De La Hunty, A., Gibson, S., & Ashwell, M. (2013). Does regular breakfast cereal consumption help children and adolescents stay slimmer? A systematic review and meta-analysis. *Obes Facts.*, 6, 70–85.
- Defeyter, M., & Russo, R. (2013). The effect of breakfast cereal consumption on adolescents' cognitive performance and mood. *Front Hum Neurosci*, 7, 789-811.
- Defeyter, M., Graham, P., Walton, J., & Apicella, T. (2010). Breakfast clubs: availability for British schoolchildren and the nutritional, social and academic benefits. *Nutrition Bulletin*, 35, 245-253.
- Donini, L.M., Castellaneta, E., Guglielmi, S.D. & Cannella, C. (2008). Improvement in the quality of the catering service of a rehabilitation hospital. *Clinical nutrition (Edinburgh, Scotland)* 27, 105-14.
- Dube, A., Naidu, S. & Reich, M. (2007). "The Economic Effects of a Citywide Minimum Wage." Institute of Industrial Relations Working Paper, available at <http://iir.berkeley.edu/wpapers/index.html>.
- Duncan, M.J., Rivis, A. & Jordan, C. (2012). Brief report: Understanding intention to be physically active and physical activity behaviour in adolescents from a low socio-economic status background: An application of the Theory of Planned Behaviour. *Journal of Adolescence* 35(3), 761-4.



- Edelson, D.C., Choy, D. & Diana, M. (2009). *Motivating active learning: A design framework for interest-driven learning*. Center for School Improvement. Chicago.
- Elsner, R.J.F. (2002). Changes in eating behavior during the aging process. *Eating Behaviors*, 3:15–43.
- Feldman, J., & Barshi, I. (2007). *The Effects of Blood Glucose Levels on Cognitive Performance: A Review of Literature*. Moffett Field, California: NASA Ames Research Center, (NASA/TM-2007-214555).
- Fishbein, M., Triandis, H. C., Kanfer, F. H., Becker, M., Middlestadt, S. E., & Eichler, A. (2001). *Factors influencing behaviour and behaviour change*. In A. Baum, T. A. Revenson, & J. E. Singer (Eds.), *Handbook of health psychology* (pp. 3–17). Mahwah, NJ: Lawrence Erlbaum Associates.
- Food Channel. (2011). Top Ten Breakfast Trends in 2011. <https://foodchannel.com/2011/top-ten-breakfast-trends-2011>.
- Furman, C.A. & Papavasiliou, F. (2012): Scale and affect in the local food movement, *Food, Culture & Society*, 1-16, DOI: 10.1080/15528014.2018.1427926
- Gans-Lartey, E. (2017 ). *The Ghana School Feeding Program as An Incentive for Education in Rural Ghana: The Case of Cocoa Growing Areas*. Accra: Institute for Democratic Governance.
- Gardner, M., Wansink, B., Kim, J., & Park, S. (2014). Better moods for better eating? How mood influences food choice. *J Consum Psychol*, 24, 320-335.

- Ghaffari, Z., Hoseini, Z., Heidarabadi, A., Tavassoli, E., Hozuri, M., Jang, S.,... Sahraiyani, M. (2015). Investigation of educational intervention based on Theory of Planned Behavior on breakfast consumption among middle school students of Qom City in 2012. *Journal of Education and Health Promotion, 4(9)*, 1-8.
- Ghana Districts. (2020). *Districts Ashanti Region* . [districts.ghana-net.com/districts-ashanti-region.html](http://districts.ghana-net.com/districts-ashanti-region.html).
- Ghana School Feeding Programme. (2006). *Ghana School Feeding Programme (GSFP) Programme Document 2007-2010*. Accra: GSFP.
- Ghana Schools Net (2019). *Senior High School - Ashanti Region*.  
<file:///C:/Users/ascorp/Downloads/Senior%20High%20School%20%20Ashanti%20Region%20-%20Ghana%20SchoolsNet.htm>.
- Gibbons, M.D.R. & Henry, C.J.K. (2005). Does eating environment have an effect on food intake in the elderly? *J Nutr Health Aging, 9(1)*:25-9.
- Gómez-Pinilla, F. (2008). Brain foods: The effects of nutrients on brain function. *Nature Reviews Neuroscience, 9(7)*, 568-578.
- Grima, N., Pase, M. P., Macpherson, H., & Pipingas, A. (2012). The effects of multivitamins on cognitive performance: a systematic review and meta-analysis. *Journal of Alzheimer's Disease, 29(3)*, 561 - 569.  
<https://doi.org/10.3233/JAD-2011-111751>
- Hasz, L., & Lamport, M. (2012). Breakfast and Adolescent Academic Performance: An Analytical Review of Recent Research. *European Journal of Business and Social Sciences, 1(3)*, 61 - 79.
- Hinrichs, P. (2010). The effects of the National School Lunch Program on education and health. *Journal of Policy Analysis and Management, 29*, 479–505.

- Holtzman, J. (2009). *Uncertain Tastes: Memory, Ambivalence, and the Politics of Eating in Samburu, Northern Kenya*. California: University of California Press
- Hoyland, A., Dye, L., & Lawton, C. (2009). A systematic review of the effect of breakfast on the cognitive performance of children and adolescents. *Nutr. Res. Rev.* , 22, 220–243.
- Imberman, S., & Kugler, A. (2014). The effect of providing breakfast in class on student performance. *Journal of Policy Analysis and Management*, 33, 669–99.
- Intiful, F. D., & Lartey, A. (2014). Breakfast Habits Among School Children in Selected Communities in The Eastern Region of Ghana. *Ghana Medical Journal*, 48(2), 71-77.
- Intiful, F., & Lartey, A. (2014). Breakfast Habits Among School Children in Selected Communities in The Eastern Region of Ghana. *Ghana Medical Journal*, 48(2), 71-77 .
- Iovino, I., Stuff, J., Liu, Y., Brewton, C., Dovi, A., Kleinman, R., & Nicklas, T. (2016). Breakfast consumption has no effect on neuropsychological functioning in children: a repeated-measures clinical trial. *Am J Clin Nutr*, 104(3), 715-721.
- Javaid, A., & Munir, I. (2018). Breakfast Skipping and its Effects on Emotional and Academic Behaviour of a Group of Saudi Medical Students. *Journal of Nutrition & Food Sciences*, 8(6), 1-4.
- Karimi, B., Hashemi, S., & Habibian, H. (2008). Study of the breakfast habits and its relationship with some factors in Semnan (Iran) pupils. *Koomesh*, 9, 285-92.

- Kawafha, M. (2013). Impact of Skipping Breakfast on Various Educational and Overall Academic Achievements of Primary School Children in Northern of Jordan. *Australian Journal of Basic and Applied Sciences*, 7(7), 155-160.
- Kawafha, M. (2013). Impact of Skipping Breakfast on Various Educational and Overall Academic Achievements of Primary School Children in Northern of Jordan. *Australian Journal of Basic and Applied Sciences*, 7(7), 155-160.
- Kennedy, S., Davies, E. L., Ryan, L., & Clegg, M. E. (2017). Applying an extended theory of planned behaviour to predict breakfast consumption in adolescents. *European Journal of Clinical Nutrition*, 71(5), doi: <https://doi.org/10.1038/ejcn.2016.192>, 607-613.
- Khani, S., & Soleimani, N. (2011). The effect of breakfast consumption on cognitive functions and fourth grade primary school students in the city of Garmsar academic year 2011-2010. *research on curricula*, 13(40), 139-50.
- Kleinman, R.E., Hall, S., Green, H., Korzec-Ramirez, D., Patton, K., Pagano, M.E. & Murphy, J.M. (2002). Diet, Breakfast, and Academic Performance in Children. *Ann Nutr Metab*. 46(1), 24–30.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: The Guilford Press.
- Kim, S.Y., Sim, S., Park, B.; Kong, G. & Kim, J., & Choi, H.G. (2016). Dietary Habits Are Associated with School Performance in Adolescents. *Medicine*, 95(12) 1-10.
- Kumar, S. H., & Haggerty, L. N. (2011). A global supplier selection process for food packaging. *Journal of Manufacturing Technology Management*, 22(2), 241-260.

- Lauren, A.; Hasz, A.; Mark, A. & Lampion, G (2012). Breakfast and Adolescent Academic Performance: An Analytical Review of Recent Research. *European Journal of Business and Social Sciences*, 1(3) 61 – 79.
- Lazzeri, G., Ahluwalia, N., Nielsen, B., Pammolli, A., Vereecken, C., Rasmussen, M.,... Kelly, C. (2016). Trends from 2002 to 2010 in Daily Breakfast Consumption and its Socio-Demographic Correlates in Adolescents across 31 Countries Participating . *the HBSC Study. PLoS ONE 11(3): e0151052*, 1-13.
- Levin, K. A., Kirby, J., & Currie, C. (2012). Family structure and breakfast consumption of 11-15-year-old boys and girls in Scotland, 1994-2010: a repeated cross-sectional study. *BMC public health*, 12(1), <http://dx.doi.org/10.1186/1471-2458-12-228>, 2-28.
- Leos-Urbel, J., Schwartz, A.E., Weinstein, M. & Corcoran, S. (2013). Not Just for Poor Kids: The Impact of Universal Free School Breakfast on Meal Participation and Student Outcomes. *Economics of Education Review* 36:88-107
- Li, J., & O'Connell, A. A. (2012). Obesity, high-calorie food intake, and academic achievement trends among U.S. school children. *The Journal of Educational Research*, 105(6), 391-403.
- Liao, C., Chen, J. & Yen, D.C. Theory of planning behavior (TPB) and customer satisfaction in the continued use of e-service 2016: An integrated model. *Computers in Human Behavior* 23(6), 2804-2822.
- Locher, J.L., Ritchie, C., Robinson, C.O. & Burgio, K.L. (2004). A Multidimensional Approach to Understanding Under-Eating in Homebound Older Adults: The Importance of Social Factors. *Gerontologist*. 223–234.

- Lundqvist, M., Vogel, N.E. & Levin, L. (2019). Effects of eating breakfast on children and adolescents: A systematic review of potentially relevant outcomes in economic evaluations. *Food & Nutrition Research*, 63: 1618 - <http://dx.doi.org/10.29219/fnr.v63.1618>, 1-16.
- Mahoney, C., Taylor, H., Kanarek, R., & Samuel, P. (2005). Effect of breakfast composition on cognitive processes in elementary school children. *Physiol Behav*, 85, 635–645.
- Mamerow, M. (2014). Dietary Protein Distribution Positively Influences 24-h Muscle Protein Synthesis in Healthy Adults 1-3. *J Nutr.*, 144(6), 876–80.
- Mamia, T. (2006). *Quantitative Research Methods*. General studies / ISSS.
- Marczyk, G., DeMatteo, D., & Festinger, D. (2005). *Essentials of Research Design and Methodology*. Hoboken, New Jersey: John Wiley & Sons, Inc.
- Masoomi, H., Taheri, M., Irandoust, K. H'Mida, C. & Chtourou, H. (2019). The relationship of breakfast and snack foods with cognitive and academic performance and physical activity levels of adolescent students. *Biological Rhythm Research*, 51(3).
- McEachan, R., Conner, M., Taylor, N., & Lawton, R. (2011). Prospective prediction of health-related behaviours with the Theory of Planned Behaviour: a meta-analysis. *Health Psychol Rev.*, 5(2), 97-144.
- McEwan, P.J. (2013). Improving Learning in Primary Schools of Developing Countries: A Meta-Analysis of Randomized Experiments *Review of Educational Research*, 1(2), 22-34.

- Mhurchu, C., Turley, M., Gorton, D., Jiang, Y., Michie, J., Maddison, R., & Hattie, J. (2010). Effects of a free school breakfast programme on school attendance, achievement, psychosocial function, and nutrition: a stepped wedge cluster randomised trial. *BMC Public Health*, *10*(738), 1-6.
- Mhurchu, C., Turley, M., Gorton, D., Jiang, Y., Michie, J., Maddison, R., & Hattie, J. (2013). Effects of a free school breakfast programme on school attendance, achievement, psychosocial function, and nutrition: a stepped wedge cluster randomised trial. *J Epidemiol Community Health*, *67*(3), 257-64.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded source book* (2nd ed.). Newbury Park, CA: Sage
- Ministry of Finance and Economic Planning (2016). *The Budget Statement And Economic Policy of The Government Of Ghana*. Accra: Ghana
- Mohd, N. M., Norimah, A., Hazizi, A., Nurliyana, A., Loh, S., & Suraya, I. (2012). Child feeding practices, food habits, anthropometric indicators and cognitive performance among preschoolers in Peninsular Malaysia. *Appetite*, *58*, 525–530.
- Morrison, B. (1993). How can Action Research Apply to Health Services? *Qualitative Health Research*, *11*(4), 1-16.
- Murphy, J.M., Drake, J.E. & Weineke, KM (2005). “Academics & Breakfast Connection Pilot: Final Report on New Yorks’s Classroom Breakfast Project.” Nutrition Consortium of New York State. Albany. New York. J
- Mullan, B., Wong, C., Kothe, E.J. & McCann, C. (2013). Predicting breakfast consumption: A comparison of the theory of planned behaviour and the health action process approach. *British Food Journal* *115*(11), 122-134

- Narad, A. & Abdullah, B. (2016). Academic Performance of Senior Secondary School Students: Influence of Parental Encouragement and School Environment. *Rupkatha Journal on Interdisciplinary Studies in Humanities*, 8(2), 23-34.
- Nijs, K. A. N. D., de Graaf, C., Siebelink, E., Blauw, Y. H., Vanneste, V., Kok, F. J., & van Staveren, W. A. (2006). Effect of family-style meals on energy intake and risk of malnutrition in dutch nursing home residents: A randomized controlled trial. *Journals of Gerontology. Series A: Biological Sciences & Medical Sciences*, 61(9), 935-942. <https://doi.org/10.1093/gerona/61.9.935>.
- Nunnally, J.C. & Bernstein, I.H. (1994). *Psychometric Theory*. (3<sup>rd</sup> ed.) New York: McGraw-Hill.
- Organization for Economic Co-Operation and Development (2007). *PISA 2006 Volume 2: Data*. Paris: OECD Publications2007.
- Ostachowska-Gasior, A., Piwowar, M., Kwiatkowski, K., Kasperczyk, J., & Skop-Lewandowska, A. (2016). Breakfast and Other Meal Consumption in Adolescents from Southern Poland. *Int J Environ Res Public Health*, 13(5), 453-485.
- Paquet, C., St-Arnaud-McKenzie, D., Kergoat, M., Ferland, G. & Dubé, L. (2003). Direct and indirect effects of everyday emotions on food intake of elderly patients in institutions. *J Gerontol A Biol Sci Med Sci.*, 58(2), 153-8.
- Perlmutter, L., Brian, P., Flanagan, B., Parinda, H., Shah, P., Sant, P., & Singh, S. (2008). Glycemic control and hypoglycemia. *Diabetes Care*, 31(10), 2072-2076.
- Pereira, M., Erickson, E. & McKee, P. (2011). Breakfast Frequency and Quality May Affect Glycemia and Appetite in Adults and Children. *Journal of Nutrition* 141(1):163-8.



- Piernas, C. & Popkin, B.M. (2009). Snacking Increased among U.S. Adults between 1977 and 2006, *The Journal of Nutrition*, *140*(2), 325–332, <https://doi.org/10.3945/jn.109.112763>.
- Philippou, E., & Constantinou, M. (2014). The influence of glycemic index on cognitive functioning: A systematic review of the evidence. *Adv. Nut.*, *5*, 119–130.
- Pivik, R., Tennal, K., Chapman, S., & Gu, Y. (2012). Eating breakfast enhances the efficiency of neural networks engaged during mental arithmetic in school-aged children. *Physiol Behav*, *106*, 548–555.
- Ptomey, L.T., Steger, F.L., Schubert, M.M., Lee, J., Willis, E.A., Sullivan, D.K., Szabo-Reed, A.N, Washburn, R.A. & Donnelly, J.E. (2016) Breakfast Intake and Composition Is Associated with Superior Academic Achievement in Elementary Schoolchildren. *J Am Coll Nutr.* *35*(4):326-33. doi: 10.1080/07315724.2015.1048381.
- Ral, T., Heo, M., Whiteford, L., & Faith, M. (2012). Effects on cognitive performance of eating compared with omitting breakfast in elementary schoolchildren. *J Dev Behav Pediatr*, *33*, 9–16.
- Rampersaud, G., Pereira, M., Girard, B., Adams, J., & Metz, J. (2005). Breakfast habits, nutritional status, body weight, and academic performance in children and adolescents. *J Am Diet Assoc.*, *105*, 743-760.
- Riebl, S., Estabrooks, P., Dunsmore, J., Savla, J., Frisard, M., & Dietrich, A. (2015). A systematic literature review and meta-analysis: The Theory of Planned Behavior's application to understand and predict nutrition-related behaviors in youth. *Eating behaviors*, *18*, 160-78.

- Sakurai, M., Yoshita, K., Nakamura, K., Miura, K., Takamura, T., Nagasawa, S.Y., Morikawa, Y., Kido, T., Naruse, Y., Nogawa, K., Suwazono, Y., Sasaki, S., Ishizaki, M. & Nakagawa, H. (2017). *Obesity Science & Practice*, 163-170.
- Sandercock, G., Voss, C., & Dye, L. (2010). Associations between habitual school-day breakfast consumption, body mass index, physical activity and cardiorespiratory fitness in English school children. *European journal of clinical nutrition*, 64(10), 1086–92.
- Sandercock, G., Voss, C., & Dye, L. (2010). Associations between habitual school-day breakfast consumption, body mass index, physical activity and cardiorespiratory fitness in English schoolchildren. *Eur J Clin Nutr*, 64, 1086-1092.
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students (5th ed.)*. . Harlow: Pearson Education Limited.
- Schwarzer, R. (2016). Health action process approach (HAPA) as a theoretical framework to understand behavior change. *Actualidades en Psicología*, 30(121), 119–130. <https://doi.org/10.15517/ap.v30i121.23458>.
- Schwarzer, R., Sniehotta, F. F., Lippke, S., Luszczynska, A., Scholz, U., Schüz, B., et al. (2003). On the Assessment and Analysis of Variables in the Health Action Process Approach: Conducting an Investigation
- Seedat, R., & Pillay, K. (2019). Breakfast consumption and its relationship to sociodemographic and lifestyle factors of undergraduate students in the School of Health Sciences at the University of KwaZulu-Natal. *South African Journal of Clinical Nutrition*, <https://doi.org/10.1080/16070658.2018.1564470>, 1-7.

- Sorhaindo, A., & Feinstein, L. (2006). *What is the relationship between child nutrition and school outcomes?* . Retrieved from the Centre for Research on the Wider Benefits of Learning website:  
<http://www.learningbenefits.net/Publications/ResReps/ResRep18.pdf>.
- Spinath, B. (2012). Academic Achievement. *Encyclopedia of Human Behavior*, 2, doi:10.1016/B978-0-12-375000-6.00001-X, 1-8.
- Steinmayr, R., Meißner, A., Weidinger, A., & Wirthwein, L. (2017). *Academic Achievement*. Oxford University Press, DOI: 10.1093/obo/9780199756810-0108, 2017.
- Sutton, S. (2005). Stage theories of health behaviour. In M. Conner & P. Norman (Eds.), *Predicting health behaviour: Research and practice with social cognition models*. Maidenhead, UK: Open University Press.
- Sutton, S. (2008). How does the Health Action Process Approach (HAPA) bridge the intention-behaviour gap? An examination of the model's causal structure. *Applied Psychology*, 57(1), 66-74.
- Szajewska, H., & Ruszczyński, M. (2010). Systematic review demonstrating that breakfast consumption influences body weight outcomes in children and adolescents in Europe. *Crit. Rev. Food Sci. Nutr.*, 50, 113–119.
- Szajewska, H., & Ruszczyński, M. (2010). Systematic review demonstrating that breakfast consumption influences body weight outcomes in children and adolescents in Europe. *Critical reviews in food science and nutrition*, 50(2), 113–9.
- Taha, Z., & Rashed, A. (2017). The Effect of Breakfast on Academic Performance among High School Students in Abu Dhabi. *Arab Journal of Nutrition and Exercise*, 2(1), DOI 10.18502/ajne.v2i1.1243, 40–49.

- Timlin, M., & Pereira, M. (2007). Breakfast frequency and quality in the etiology of adult obesity and chronic diseases. *Nutr Rev*, *65*(6), 268-81.
- Tin, S. P., Ho, S. Y., Mak, K. H., Wan, K. L., & Lam, T. H. (2011). Lifestyle and socioeconomic correlates of breakfast skipping in Hong Kong primary 4 schoolchildren. *Preventive medicine*, *52*(3), <http://dx.doi.org/10.1016/j.ypmed.2010.12.012>, 250-253.
- Turki, M., Shloi, S., Harbi, A., Agil, A., & Othman, F. (2019). Effect of breakfast consumption on the cognitive and academic performances in schoolchildren: A cross sectional study in Riyadh, Saudi Arabia. *International Research Journal of Medicine and Medical Sciences*, *7*(3), 75-83.
- Vahedi, H., Pourabdollahi, P., Biglarian, A., Lemoki, S., Kabirzadeh, A., & Sadeghi, R. (2007). Study of awareness towards and the pattern of milk consumption in 7-12 year old elementary school students in the city of Sari and their mothers (2005-2006). *J Mazandaran Univ Med Sci*, *17*, 94-102.
- Valladares, M., Durán, E., Matheus, A., Durán-Agüero, S., Obregón, A., & Ramírez-Tagle, R. (2016). Association between Eating Behavior and Academic Performance in University Students. *Journal of the American College of Nutrition*, *0*(0), DOI: 10.1080/07315724.201, 1-5.
- Valladares, M., Durán, E., Matheus, A., Durán-Agüero, S., Obregón, A., & Rodrigo Ramírez-Tagle, R. (2016). Association between Eating Behavior and Academic Performance in University Students. *Journal of the American College of Nutrition*, DOI: 10.1080/07315724.201, 1-7.
- Van Wye, G., Seoh, H., Adjoian, T., & Dowell, D. (2013). Evaluation of the New York City breakfast in the classroom program. *American Journal of Public Health*, *103*, e59-e64.

- Vermeersch, C., & Kremer, M. (2004). *School meals, educational achievement, and school competition: evidence from a randomized evaluation. World Bank Policy Research working paper No. 3523*. Washington, DC: World Bank.
- Vermeersch, C., & Kremer, M. (2004). *School meals, educational achievement, and school competition: evidence from a randomized evaluation. World Bank Policy Research working paper No. 3523*. Washington, DC: World Bank.
- Wahlstrom, K.L. & Begalle, M. S. (1999). More than test scores: results of the universal school break- fast pilot in Minnesota. *Top. Clin. Nutr.* 15, 17–29
- Wesnes, K.A., Pincock, C., Richardson, D., Helm, G. & Hails, S (2003). Breakfast reduces declines in attention and memory over the morning in schoolchildren. *Appetite.* 41(3):329-31. doi: 10.1016/j.appet.2003.08.009.
- West African Senior School Certificate Examination. (2020). [https://en.wikipedia.org/wiki/West\\_African\\_Senior\\_School\\_Certificate\\_Examination](https://en.wikipedia.org/wiki/West_African_Senior_School_Certificate_Examination). Wikipedia.
- Wikipedia. (2020). *List of senior high schools in the Ashanti Region*. the free encyclopedia. Retrieved from "[https://en.wikipedia.org/w/index.php?title=List\\_of\\_senior\\_high\\_schools\\_in\\_the\\_Ashanti\\_Region&oldid=948509592](https://en.wikipedia.org/w/index.php?title=List_of_senior_high_schools_in_the_Ashanti_Region&oldid=948509592)" Accessed on 1 April 2020.
- Wikby, K. & Fägerskiöld, A.M. (2004). The willingness to eat Scandinavian Journal of Caring Sciences 18(2):120-7
- Wilder Research. (2014). *Nutrition and Students' Academic Performance*. Lexington Parkway North- Minnesota: [www.wilderresearch.org](http://www.wilderresearch.org).
- Wilson, N., Parnell, W., Wohlers, M., & Shirley, P. ( 2006). Eating breakfast and its impact on children's daily diet. *Nutrition & Dietetics*, 63, 15-20.

Wi-Young, S. (2013). Association between Frequency of Breakfast Consumption and Academic Performance in Healthy Korean Adolescents. *Iranian Journal of Public Health* 42(1):25-32

Yusuf, T. A., Onifade, C A. & Bello, O S. (2016) "Impact of Class Size on Learning, Behavioral and General Attitudes of Students in Secondary Schools in Abeokuta, Ogun State Nigeria, *Journal of Research Initiatives: 2*(1), 1-19

Zilberter, T., & Zilberter, E. (2014). Breakfast: To Skip or Not to Skip?, 59 (2). 144-156.



**APPENDIX**

**UNIVERSITY OF EDUCATION WINNEBA- KUMASI CAMPUS**

**Master of Philosophy Catering and Hospitality**

**Questionnaire Items**

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**Dear Sir/Madam,**

The aim of this study is to assess whether breakfast consumption contribute to students' academic performance and class involvement at the secondary school level. This study is for academic purpose only and will help relevant agencies to understand whether breakfast intake has any meaningful effect on students' academic performance. Your responses, though voluntary, are greatly appreciated and would be treated with utmost confidentiality. Thank you.

**Instructions:** Please tick (✓) the response that best describe your view.

**Section A: Background**

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1. Age [Please tick one]

I. 0-10 [ ] II. 11-15 [ ] III. 16-20 [ ] IV. 21-25 [ ] V. above 26 years [ ]

2. Gender [Please tick one]

I. Male [ ] II. Female [ ]

3. Educational qualification [Please tick one]

I) B.E.C.E [ ] II) S.S.S/W.A.S.S.C.E. [ ] III) Others please specify .....

4. What course are you currently studying at school?

I. General Arts [ ] II. General Science [ ] III. Business [ ]

IV. Agricultural Science [ ]

V. Home economics [ ] VI. Visual Arts [ ] VII. Others please specify .....

5. Indicate the school you are currently studying this course/programme at .....
6. What description best describe your student's status?
- I. Day student [ ] II. Boarding student [ ]
7. What year are you presently?
- I. Year one [ ] II. Year two [ ] III. Year three [ ]
8. Do stay/live with both biological parents?
- I. Yes [ ] II. No [ ]
9. If **No** indicate the person you live/stay with.
- I. Father only [ ]
- II. Mother only [ ]
- III. Relative [ ]
- IV. Sibling [ ]
- V. Family Friend [ ]
- VI. Others please specify .....
10. What is the marital status of your parents?
- I. Married [ ] II. Divorced/Separated [ ] III. Single [ ] IV. Widowed [ ]
- V. Never married [ ]
11. What is your mother level of education?
- I). No formal education [ ] II. Basic education [ ] III. S.S.S.C.E./W.A.S.S.C.E. [ ]
- IV). National Vocational Training [ ] V). Higher National Diploma [ ]
- VI). Degree [ ] VII). Masters' degree VIII) Others please specify .....
12. What is your father level of education?
- I). S.S.S/W.A.S.S.C.E. [ ] II). National Vocational Training [ ]
- III). Higher National Diploma [ ] IV). Degree [ ]
- V). Masters' degree VI) Others please specify .....



13. What is the occupation of your parents?

I. Teacher [ ] II. Medical professional [ ] III. Accountant [ ] IV. Mason [ ]

V. Carpenter [ ] VI. Farmer [ ] VII. Unemployed [ ] VIII. Trader [ ]

IX. Others please specify .....

14. What location best describes where you presently stay?

I. rural area [ ] II. A small town [ ] III. A medium-sized town [ ]

IV. A suburb [ ] V. A city [ ]

### **Section B: Second Cycle Students Breakfast Consumption Habit**

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**These questions seek to identify the frequency with which you consume breakfast on a daily basis. Tick the option that best describe your breakfast consumption habit.**

15. Do you always take breakfast before going to class?

I. Yes [ ]

II. No [ ]

16. At what time in the morning do you often take your breakfast?

I. Between the hours of 6:00-7:00 am [ ]

II. Between the hours of 7:30-8:30 am [ ]

III. Between the hours of 9:00-10:00 am [ ]

IV. Between the hours of 10:30-11:30 am [ ]

V. After 12:00 noon [ ]

17. Recalling from last week, for how many days within the week did you take breakfast.

I. None [ ]

II. For only one day [ ]

III. For only two days [ ]

III. For only three days [ ]

IV. For only four days [ ]

V. For only five days [ ]

VI. For only six days [ ]

VII. For all the seven days [ ]

18. If you failed to take your breakfast for most of the days within the week what accounted for that.

I. Not feeling hungry for most of the days [ ]

II. Had no money [ ]

III. Late for school/class [ ]

IV. Dislike most of the food choices given as breakfast [ ]

V. I skipped most of the breakfast in order not to gain weight [ ]

VI. Any other reason please specify .....

19. What meal composition best describes the breakfast often consumed by you in the day.

I. Hausa koko with koose [ ]

II. Hausa koko with bread [ ]

III. Tom brown with bread [ ]

IV. Oat with milk, bread and egg [ ]

V. Rice water with bread and margarine [ ]

VI. Oblayo with milk and bread [ ]

VII. Ekuegbemi with bread [ ]

VIII. Tea with bread and egg [ ]

IX. Coffee with bread and egg [ ]

X. Biscuit with soft drinks

XI. Soft drinks with bofrot

XII. None of the above

XIII. Others specify .....

20. When at home/during weekends do you always take breakfast?

I. Never [ ]

II. Rarely [ ]

III. Sometimes [ ]

IV. Very often [ ]

V. At all times [ ]

