ENSIGN GLOBAL UNIVERSITY, KPONG

EASTERN REGION, GHANA

FACULTY OF PUBLIC HEALTH

DEPARTMENT OF COMMUNITY HEALTH

DIETARY HABITS, NUTRITIONAL STATUS, AND RELATED FACTORS AMONG ADOLESCENTS AT SELECTED BASIC SCHOOLS IN THE ASHAIMAN MUNICIPALITY OF THE GREATER ACCRA REGION, GHANA

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NOVEMBER, 2025

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BY

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A THESIS SUBMITTED TO THE FACULTY OF PUBLIC HEALTH, DEPARTMENT OF COMMUNITY HEALTH, ENSIGN GLOBAL UNIVERSITY, KPONG IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH

NOVEMBER, 2025

DECLARATION

I, Esther Ewurabena Naadu Apeanyo, hereby declare that this submission is my own work towards the award of the Master of Public Health (MPH) degree and, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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(Head of Academic Program)   **Signature**   **Date**

DEDICATION

This work is dedicated to the Almighty God, whose grace and guidance have sustained me throughout this academic journey. It is also dedicated to my beloved parents and family for their unwavering love, support, and encouragement. To all the adolescents who participated in this study, I extend my deepest appreciation; your willingness to share your experiences made this work possible.

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ABBREVIATION / ACRONYMS

AOR	Adjusted Odds Ratio
ASHMA	Ashaiman Municipal Assembly
BAZ	Body Mass Index-for-Age Z-score
BMI	Body Mass Index
CI	Confidence Interval
COR	Crude Odds Ratio
FDMN	Forcibly Displaced Myanmar Nationals
GDHS	Ghana Demographic Health Survey
GSFP	Ghana School Feeding Programme
GSS	Ghana Statistical Service
JHS	Junior High School
LI	Legislative Instrument
MPH	Master of Public Health
PHC	Population and Housing Census
SDG	Sustainable Development Goal
SEM	Socio-Ecological Model
SHS	Senior High School
SSB	Sugar-Sweetened Beverage
SSA	Sub-Saharan Africa
STATA	Statistics and Data (Software)
TMA	Tema Municipal Assembly
UN	United Nations
UNICEF	United Nations Children's Fund
UN-OCHA	United Nations Office for the Coordination of Humanitarian Affairs
WHO	World Health Organization

ABSTRACT

Adolescence represents a crucial phase of human development, characterized by heightened nutritional requirements that support optimal physical growth and mental development. In rapidly urbanizing environments such as Ashaiman, adolescents often encounter dietary difficulties arising from socioeconomic disparities, food insecurity, and evolving food consumption behaviors. Although Ghana has implemented various national nutrition programs, there remains a lack of detailed, context-specific data on adolescent eating patterns and the factors influencing them in peri-urban settings like Ashaiman.

General Aim: The purpose of this study was to evaluate the eating behaviors, nutritional condition, and associated determinants among adolescents attending selected basic schools within the Ashaiman Municipality of the Greater Accra Region, Ghana.

Methods: A quantitative, school-based cross-sectional study design was adopted, involving 422 adolescents aged 10–19 years from three basic schools in the Ashaiman Municipality. Stratified random sampling was used to ensure balanced representation across groups. Data collection employed a semi-structured questionnaire informed by the Socio-Ecological Model, complemented by anthropometric measurements such as height and weight. Nutritional status was determined using Body Mass Index (BMI)-for-age Z-scores. Data analysis was conducted using STATA version 18, applying descriptive statistics, chi-square tests, and logistic regression to explore associations between dietary patterns, nutritional status, and influencing variables.

Results: Approximately 71.1% of participants reported consuming three meals per day, though breakfast (41.9%) and lunch (41.2%) were the meals most frequently skipped. A substantial proportion (70.6%) consumed sugar-sweetened beverages at least twice weekly, while only 22.8%

ate fruits and 21.8% ate vegetables on a daily basis. Snacking was common, particularly on biscuits (27.3%) and fried foods (19.2%), compared to fruit-based snacks (8.1%). Based on nutritional assessment, 9.5% of adolescents were underweight, 78.9% had a normal BMI-for-age, and 11.6% were overweight or obese reflecting the coexistence of under nutrition and excess weight. Logistic regression analysis revealed significant associations between dietary behavior and factors such as gender, parental education, household size, and barriers like food affordability and time constraints ($p < 0.05$).

Conclusions: Findings indicate that adolescents in Ashaiman demonstrate diverse dietary behaviors, where healthy eating practices are undermined by frequent meal omission and high consumption of calorie-dense, low-nutrient foods. The coexistence of undernutrition and overweight suggests a dual burden of malnutrition influenced by socio-demographic, interpersonal, and environmental determinants. The study underscores the importance of targeted interventions particularly school-based nutrition programs, greater parental engagement, and community-oriented initiatives to promote healthier eating habits and improved nutritional wellbeing among adolescents in Ashaiman.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Adolescence represents a critical developmental stage characterized by rapid physical and biological changes, where sufficient nutrient intake is essential to sustain the growth spurt (Sinai et al., 2021). This period is also a highly anabolic phase, during which the body's nutritional requirements significantly increase to enable optimal growth and maturation (Das et al., 2017). It is estimated that during adolescence, individuals achieve approximately 20% of their final adult height, 50% of their adult body weight, and experience a 45% increase in bone mass (Kedir, Berhane, & Worku, 2016). The World Health Organization (WHO) defines adolescence as the stage of human development between childhood and adulthood, covering ages 10 to 19, and marked by profound physiological, psychosocial, and cognitive transformations (WHO, 2025). Several behavioral and lifestyle factors developed during adolescence particularly unhealthy dietary habits can lead to the emergence of chronic diseases later in life (Das et al., 2017; WHO, 2025). Maintaining nutritious eating patterns throughout this stage is vital for supporting physical and cognitive growth, psychosocial development, and preventing diet-related non-communicable diseases in adulthood (Lassi, Moin, & Bhutta, 2017). The 2018 Global Nutrition Report revealed that adolescent obesity rates continue to rise globally by 6.5% per year among males and 4.7% among females across 195 countries (Fanzo et al., 2018; Abdulai et al., 2020).

The global shift in nutrition, reflected through increased urbanization, changing dietary habits, and declining physical activity levels, is a defining feature of what is termed the "nutrition transition" (Abizari & Ali, 2019a). Although many low- and middle-income nations still battle infectious

diseases and under nutrition (Ochola & Masibo, 2014), they now face growing rates of non-communicable diseases (NCDs) once prevalent only in high-income countries (Abizari & Ali, 2019a; Abdulai et al., 2020). This ongoing nutrition transition is a major driver of the escalating NCD burden in developing countries (Abizari & Ali, 2019a). In Africa, approximately 15% of adolescents are overweight or obese, placing them at increased risk for diabetes and other nutrition-related conditions later in life (Akseer et al., 2017). Ghana is among the few sub-Saharan African nations experiencing an advanced stage of this nutrition transition, with changing dietary patterns already affecting population health (Abizari & Ali, 2019a; Abdulai et al., 2020). These dietary shifts were first observed in the 1990s (Abdulai et al., 2020). In recent years, adolescents in developing countries, including Ghana, have moved away from traditional diets rich in cereals, tubers, fruits, vegetables, and low-fat foods toward Westernized diets that are less diverse but higher in fats, sugars, and processed ingredients (Ochola & Masibo, 2014). Since adolescents spend much of their time in school and have increasing independence in making food choices, they are particularly vulnerable to unhealthy eating habits (Abdulai et al., 2020).

A range of social and environmental influences affect adolescent food decisions, including peer pressure, media exposure, and body image perceptions. Compared to younger children, adolescents tend to snack more frequently, skip meals, consume fast food, and eat away from home or late at night (Dzielska et al., 2020; Grummon, Sokol, & Lytle, 2021). Furthermore, risk behaviors such as physical inactivity, tobacco use, and alcohol consumption often begin during this period and interact with nutrition through shared biological pathways (Kóyuk et al., 2020).

Analyzing dietary patterns has become an important epidemiological approach for assessing overall diet quality and its relationship to disease outcomes (Abdulai et al., 2020). Studies of

adolescent eating behaviors have been key to understanding the development of chronic conditions. One advantage of assessing dietary patterns is that they are simple to communicate and interpret, making them accessible to the general public (Abizari & Ali, 2019a). Data from the Ghana Demographic and Health Survey (2014) showed that 14% of Ghanaian adolescents were underweight (GSS, 2015). Additional findings indicated that 6.3% were underweight while 6.0% were overweight or obese (Abizari & Ali, 2019a). Multiple factors shape adolescents' dietary behaviors in Ghana, including poverty, schooling environment, and cultural norms (Abizari & Ali, 2019a). Those from economically disadvantaged households often have limited access to nutritious foods and healthcare, increasing their vulnerability to poor dietary intake and micronutrient deficiencies (Abdulai et al., 2020). Moreover, adolescents who spend most of their time in school and with peers tend to consume readily available foods, regardless of their nutritional value (Abizari & Ali, 2019a; Abdulai et al., 2020).

Empirical studies further illustrate these challenges. Abiba, Grace, and Kubreziga (2012) found that 73% of adolescents in Tamale rarely consumed eggs or meat, and 56% frequently ate both light and heavy snacks. Nsiah-Asamoah (2017) reported that adolescents with unhealthy eating patterns often failed to meet daily nutrient requirements. Similarly, Buxton (2014) observed that 62.8% of junior high school students regularly skipped breakfast. In another Northern Region study, 30% skipped breakfast, 73% rarely ate eggs, and 37% snacked twice daily (Abiba, Grace, & Kubreziga, 2012). Collectively, these findings reveal widespread poor dietary practices such as low protein intake, habitual meal skipping, and high snack consumption which contribute to nutritional imbalances and long-term health risks.

Although adolescent nutrition has been studied in Ghana, there remains limited research focused on context-specific influences shaping adolescent diets and nutritional outcomes within urban settings such as Ashaiman. This study therefore aims to assess dietary behaviors, nutritional status, and associated determinants among adolescents attending selected basic schools in the Ashaiman Municipality, located in the Greater Accra Region of Ghana.

1.2 Problem statement

Adolescence represents a pivotal stage in human growth, marked by rapid physiological changes, hormonal adjustments, and increased nutritional requirements. Maintaining appropriate dietary behaviours during this phase is vital for ensuring optimal growth, health, and mental performance (Lassi, Moin, & Bhutta, 2017; Khan et al., 2022). Nonetheless, adolescents are at heightened risk of poor nutrition due to inconsistent eating routines, a tendency toward energy-dense, low-nutrient foods, and limited understanding of healthy nutrition practices (Sinai et al., 2021). This concern is particularly evident in low- and middle-income nations where under nutrition and excessive weight gain coexist, forming what is often termed the "double burden of malnutrition" (Winichagoon & Margetts, 2017).

In many developing settings, including Ghana, adolescents experience the dual challenge of nutrient deficiency and increasing obesity prevalence reflecting the ongoing nutrition transition (Manyanga et al., 2014). Their eating patterns are shifting away from traditional, nutrient-rich meals toward Westernized diets that emphasize highly processed and calorie-dense foods (Abizari & Ali, 2019b). Since most adolescents spend a substantial portion of their day in school and enjoy a degree of autonomy in food choices, the school environment significantly influences whether they adopt or abandon healthy dietary behaviors and active lifestyles (Abizari & Ali, 2019b).

Although national trends in Ghana show a decline in adolescent underweight rates falling by 18.3 percentage points between 2007 and 2015, however, the proportion of overweight and obese youth rose concurrently from 8.7% to 13% within the same period (Manyanga et al., 2014; Kumah et al., 2015). National and regional surveys have offered limited insight into adolescent nutrition, leaving notable gaps in community-level evidence particularly among those at the formative stages of lifelong eating patterns.

For example, Hormenu (2022) observed in Ghana's Central Region that only 49.9% of students practiced healthy dietary behaviors. While sugary beverages (93%) and sweets (90%) were widely consumed, regular breakfast intake remained low, with just over half (57%) reporting daily participation. Similarly, in the Tamale Metropolis, Abdulai et al. (2023) found that 26.1% of adolescents were underweight, whereas 5.2% and 0.7% were classified as overweight and obese, respectively. The Ashaiman Municipality which is an urbanized and socioeconomically diverse area in the Greater Accra Region offers an important case for understanding how environmental and socioeconomic dynamics shape adolescent nutrition. Yet, there is a scarcity of empirical data addressing these influences within this locality. This lack of localized information restricts the development of evidence-based, contextually tailored strategies to address adolescent nutrition challenges. Therefore, this research aims to bridge this gap by examining the eating habits, determining the nutritional status using anthropometric indices, and analysing how demographic, social, environmental, and institutional determinants affect food-related behaviours among adolescents in Ashaiman.

1.3 Rationale of Study

Adolescence represents a pivotal stage of human development characterized by accelerated physical growth, heightened nutritional needs, and the establishment of long-term eating behaviors. During this period, inadequate dietary practices can have lasting negative effects, contributing to issues such as undernutrition, obesity, overweight, and deficiencies in essential micronutrients (Lassi, Moin, & Bhutta, 2017). In Ghana, however, adolescent nutrition has not been studied as extensively as that of younger children or pregnant women, resulting in limited evidence to guide targeted interventions for this crucial population group (Abdulai et al., 2023).

The focus of this research on the Ashaiman Municipality is particularly relevant given the area's dense population, socioeconomic diversity, and environmental conditions that may influence adolescents' eating habits and nutritional well-being (Ashaiman Municipal Assembly, 2025). Conducting localized studies in such urban contexts is vital for uncovering the distinct factors affecting adolescent nutrition, especially amidst increasing urbanization, evolving food systems, and shifting consumption trends among Ghanaian youth. Findings from this study will provide evidence-based insights to guide public health strategies, nutrition education initiatives, and school-level interventions designed specifically for adolescents in Ashaiman. Beneficiaries of the results include municipal health authorities, educational institutions, parents, teachers, and policymakers. In particular, data generated from this work will assist the Ashaiman Municipal Health Directorate and the Ghana Education Service in formulating and implementing nutrition programs tailored to the needs of local adolescents.

At the national scale, the research complements ongoing initiatives such as the Ghana School Feeding Programme (GSFP) and aligns with broader governmental priorities under the Ministry

of Health and the National Nutrition Policy (2016–2020 and subsequent revisions). It also supports Ghana's commitment to global development agendas, especially the Sustainable Development Goals (SDGs) namely SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), SDG 4 (Quality Education), and SDG 10 (Reduced Inequalities). Given these linkages, the study is both timely and significant, as it seeks to generate context-specific knowledge on adolescent nutrition and eating behaviors within Ashaiman. By identifying the main trends, barriers, and influencing determinants, the research will contribute to designing effective school-based and community-driven interventions to enhance adolescent health and nutrition outcomes. Ultimately, the outcomes of this work are expected to not only improve the nutritional well-being of adolescents in Ashaiman but also serve as a framework for similar studies and health initiatives in other urban municipalities across Ghana.

1.4 Conceptual Framework

This study is anchored in the Socio-Ecological Model (SEM), which serves as a comprehensive framework for analyzing the multiple and interconnected factors that shape adolescents' eating behaviors and nutritional outcomes. The SEM emphasizes that individual behavior is not solely determined by personal decisions but is also influenced by broader social, environmental, and institutional contexts that interact dynamically (McLeroy et al., 1988). As depicted in the study's conceptual framework, four principal layers of influence are identified and examined.

ANTECEDENTS ➡ EXPERIENCE

| Sociodemographic Factors |
| Gender, parental education, Household size, age |

| Interpersonal factors |
| Family influence, peer influence |

| Environmental & Institutional factors |
| Affordability, food availability, school food environment, time constraints |

| Dietary Habits |
| Meal frequency and skipping, snacking patterns, fruit/vegetable intake, sugary drinks |
| **Nutritional Outcomes** |
| Thinness, Underweight, Normal, Overweight/ Obese |

Figure 1 Conceptual Framework of Study (Socio-Ecological Model)

Source: (Modified from McLeroy et al., 1988)

At the socio-demographic level, the focus is on individual characteristics such as age and gender, which play a direct role in shaping adolescents' dietary behaviors and nutritional outcomes. These variables help explain differences in meal skipping, snacking tendencies, and weight status among adolescents. The interpersonal level encompasses social relationships and networks, particularly family and peer influences. Within this context, parental and guardian practices guide food preparation and meal choices, while peer groups often affect snacking behaviors and the consumption of sugary drinks.

Furthermore, the environmental and institutional levels relate to the physical and economic access to food within adolescents' daily surroundings. The affordability and availability of food at home, in schools, and across communities largely determine both the quality and quantity of food intake.

Collectively, these interconnected factors shape adolescents' overall dietary patterns, nutritional status, and related behaviors. In this research, the Socio-Ecological Model (SEM) serves as the analytical framework for examining the multiple layers of influence on adolescents' nutrition and eating behaviors. It guided data collection and interpretation by categorizing determinants into individual, interpersonal, environmental, and institutional dimensions. This framework enables a more comprehensive understanding of how personal traits, social interactions, community contexts, and institutional systems jointly affect dietary practices and nutritional well-being among adolescents in the Ashaiman Municipality.

1.5 Research Questions

1. What are the dietary habits among adolescents at selected basic schools in the Ashaiman Municipality?
2. What is the nutritional status among adolescents at selected basic schools in the Ashaiman Municipality based on anthropometric indicators?
3. What factors are associated with dietary habits and nutritional status among adolescents at selected basic schools in the Ashaiman Municipality?

1.6 General Objective

To assess the dietary habits, nutritional status, and related factors among adolescents at selected basic schools in the Ashaiman Municipality of the Greater Accra Region, Ghana.

1.7 Specific Objectives

1. To describe the dietary habits of adolescents at selected basic schools in the Ashaiman Municipality.

2. To determine the nutritional status of adolescents at selected basic schools in the Ashaiman Municipality using anthropometric indicators.

3. To identify factors associated with dietary habits and nutritional outcomes among adolescents at selected basic schools in the Ashaiman Municipality.

1.8 Profile of the Study Area

The Ashaiman Municipality, located in Ghana's Greater Accra Region, functions as an important centre for administrative, economic, and social activities. It was officially established on November 30, 2007, through *Legislative Instrument (LI 1889)*, following its separation from the Tema Municipal Assembly (TMA) as part of Ghana's decentralization policy designed to promote effective local governance and development (Ashaiman Municipal Assembly, 2025). The Ashaiman Municipal Assembly (ASHMA) serves as the main governing and developmental authority in the area, exercising deliberative, legislative, and executive functions. The Assembly is made up of 25 members, 17 elected representatives and 8 presidential appointees led by a Municipal Chief Executive who chairs the executive committee (Ashaiman Municipal Assembly, 2025).

Geographically, Ashaiman is situated about 4 kilometres north of Tema and 30 kilometres from Accra, the national capital. It lies within latitude 5°42' North and longitude 0°01' West, covering an estimated land area of 30.2 square kilometres (Ashaiman Municipal Assembly, 2025). The municipality shares borders with Kpone-Katamanso to the north and east, and Tema Metro and

Tema West to the south and west. Its strategic position makes Ashaiman a key peri-urban link between major industrial and urban centres, contributing significantly to regional socio-economic growth (Ashaiman Municipal Assembly, 2025).

According to data from the 2021 Population and Housing Census (PHC), Ashaiman's population was 206,060, growing at an annual rate of 4.6% (GSS, 2021). By 2023, the figure was projected to reach 225,453, indicating a growth rate well above the Greater Accra Region's average of 1.72% (Ashaiman Municipal Assembly, 2025).

The municipality encompasses 22 communities, all of which are urbanized and connected by extensive road networks. Education remains a top priority, with 534 educational institutions ranging from pre-schools and primary schools to junior high schools (JHS), senior high schools (SHS), and technical/vocational institutions (Ashaiman Municipal Assembly, 2025). The private sector dominates the education landscape, accounting for the majority of schools and enrolments. In terms of healthcare, the municipality is supported by 23 health facilities, including 10 private hospitals, 2 government polyclinics, and 3 public health centres, ensuring access to essential medical services for its residents (Ashaiman Municipal Assembly, 2025).
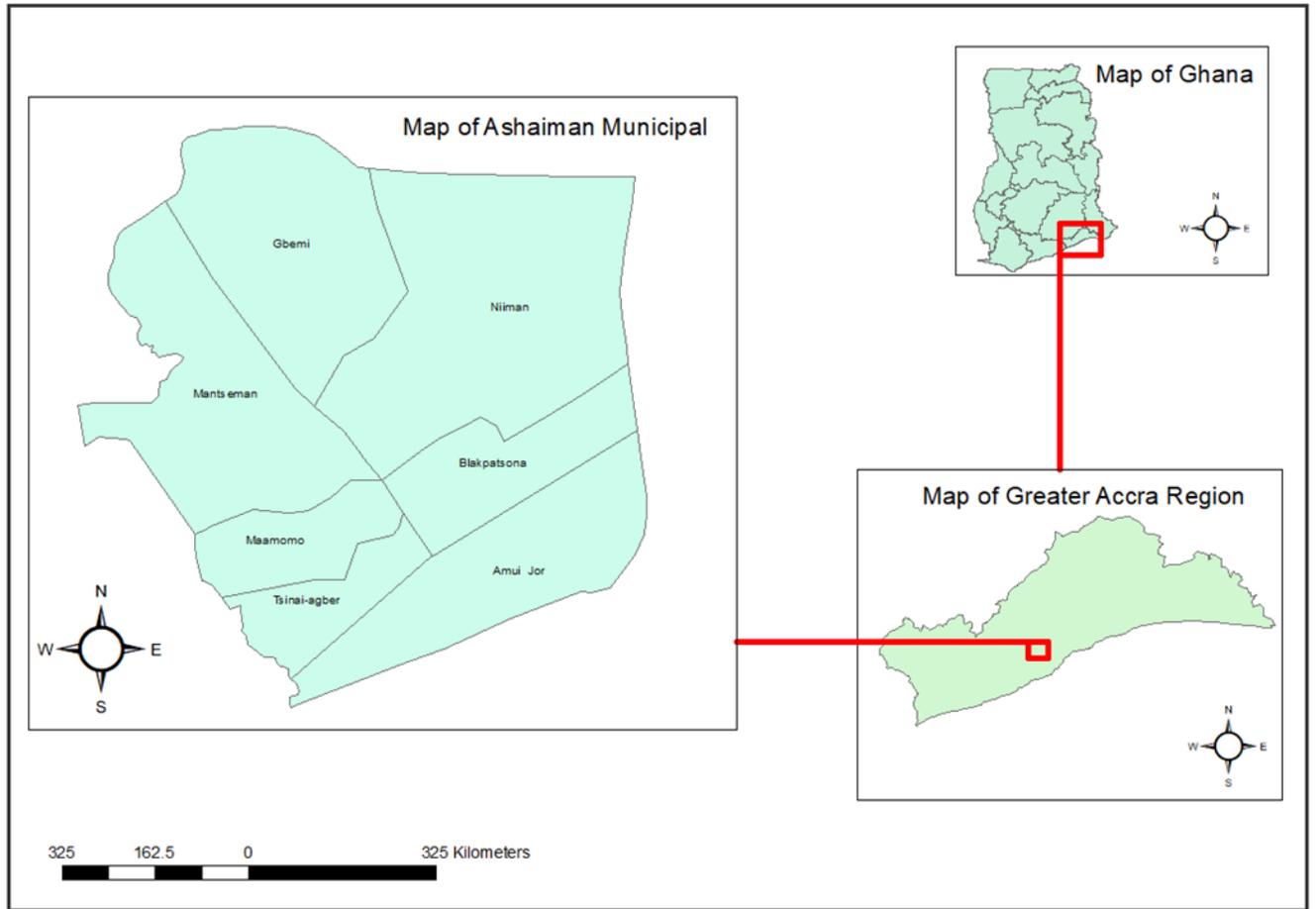
Figure 2 Map of Ashaiman Municipality

Source: Ashaiman Municipal Assembly

1.9 Scope of Study

This research was conducted within three selected basic schools—Ashaiman No. 5A Basic School, Blessed Clementina Basic School, and Ashaiman Presby A Basic School—located in the Ashaiman Municipality of Ghana's Greater Accra Region. The focus group comprised adolescents aged 10 to 19 years who were enrolled in these schools. The study examined their dietary behaviours, including eating frequency and food preferences, assessed their nutritional well-being using anthropometric indicators such as Body Mass Index (BMI)-for-age, and explored the socio-

demographic, interpersonal, and environmental determinants influencing these behaviours and nutritional outcomes. The scope of the study excluded adolescents outside the formal school environment and did not include biochemical or clinical assessments of nutritional status.

1.10 Organization of Report

This thesis is structured into six chapters. Chapter One (Introduction) provides an overview of the study, outlining the background, problem statement, objectives, research questions, significance, scope, and the organization of the document.

Chapter Two (Literature Review) synthesizes relevant theoretical and empirical studies on adolescent dietary practices, nutritional conditions, and their influencing factors, discussing conceptual foundations, frameworks, and previous evidence that inform the current research.

Chapter Three (Methodology) details the research design, description of the study area, target population, sampling strategy, data collection tools, and analytical procedures, together with ethical considerations that guided the research process.

Chapter Four (Results) presents the empirical findings derived from the data, incorporating both descriptive and inferential analyses aligned with the stated objectives.

Chapter Five (Discussion) interprets these results in relation to prior research, emphasizing significant patterns, implications, and contributions to existing knowledge.

Finally, Chapter Six (Conclusions and Recommendations) summarizes the main findings, draws relevant conclusions, and provides actionable recommendations for stakeholders including educators, health practitioners, and policymakers while identifying potential directions for further study.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of existing scholarly works on adolescent dietary behaviours, nutritional conditions, and the factors that influence them. It presents both global and regional perspectives on adolescent nutrition, discusses prevalent eating patterns and their health implications, and identifies the key determinants that shape nutritional outcomes during this vital stage of growth and development. The literature reviewed directly supports and aligns with the specific objectives outlined in this study.

2.2 Dietary Habits of Adolescents

An investigation involving 10,280 adolescents aged 10–13 years in the United States identified notable dietary deficiencies across different socio-demographic groups (Nagata et al., 2025). Findings showed that male adolescents generally exhibited poorer dietary quality than females, consuming 0.14 fewer cups of fruit, 0.08 fewer cups of vegetables, and 0.46 grams less whole grains daily (Nagata et al., 2025). In contrast, males had higher intakes of added sugars which is about 5.28 grams more per day and a glycaemic load 9.40 points greater than their female peers (Nagata et al., 2025).

Globally, inadequate dietary practices are also evident. UNICEF (2025) reports that around 21% of adolescents eat vegetables less than once daily, 34% consume fruit less than once per day, 42% drink sugary soft drinks daily, and 46% consume fast food at least once a week. Likewise, data from the UK National Diet and Nutrition Survey revealed that only 7% of females and 10% of

males aged 11–18 years met the recommended daily fruit and vegetable intake (Thana'Y, Takruri, & Tayyem, 2019).

In South Asia, Islam et al. (2024) found that many adolescents in Cox's Bazar, Bangladesh, did not meet essential nutritional needs. Deficiencies were widespread in protein (89.9%), vegetable (82.8%), and dairy (90.8%) intake, while 58.9% of participants reported insufficient daily water consumption (R. Islam et al., 2024). Similarly, research conducted in Addis Ababa, Ethiopia, showed limited dietary diversity among adolescents, averaging only 3.6 out of 10 possible food groups within 24 hours (Trübswasser et al., 2022). The study also noted that 23.5% of adolescents regularly consumed ultra-processed foods and beverages, often spending pocket money on sugary drinks, sweets, and fried snacks (Trübswasser et al., 2022).

Comparable findings were observed in Sub-Saharan Africa (SSA). Madzorera et al. (2023) reported that while boys in SSA consumed fewer unhealthy foods, their intake of cruciferous vegetables and deep orange tubers was also lower. Additionally, older adolescents were found to eat more fish but less red meat (Madzorera et al., 2023). In Nigeria, Ogbonna et al. (2024) discovered widespread nutrient deficiencies among adolescents, including vitamin A (76.5%), calcium (64.7%), iodine (88.2%), iron (82.4%), and zinc (58.8%). About one-quarter (25.4%) of the participants ate only two meals per day, with lunch being the most frequently skipped meal (17.6%) (Ogbonna et al., 2024).

In Ghana, similar patterns were documented. Buxton (2014) found that 62.8% of junior high school students in the Cape Coast Metropolis regularly missed breakfast, 44.8% typically consumed two cooked meals per day, and 33.8% identified soft drinks as their preferred daytime snack. Likewise, Hormenu (2022) reported that although 49.9% (n = 654) of in-school adolescents practiced

generally healthy eating habits, soft drink (93%, n = 1,220) and sweet consumption (90%, n = 1,183) were prevalent, while breakfast skipping remained common at 57% (n = 749).

2.3 Nutritional Status of Adolescents

Understanding adolescent nutritional status is crucial because this developmental stage represents a vital period for physical growth, cognitive development, and the formation of lifelong dietary and health habits (Thana'Y, Takruri, & Tayyem, 2019). In a study conducted in the western region of Turkey, Koca and Arkan (2021) reported that, based on Body Mass Index (BMI) classifications, 21.4% of high school students were underweight, 62.1% had normal weight, and 16.5% were overweight.

Similarly, research in Nepal by Dirghayu et al. (2021) revealed that more than one-fifth (21%) of households experienced food insecurity. Among adolescents, 5.5% were moderately undernourished, and 2.6% were severely undernourished according to BMI-for-age assessments. With respect to height-for-age, 8.4% were moderately stunted and 5.8% severely stunted, while weight-for-age measurements showed that 13.0% were moderately underweight and 1.3% severely underweight (Dirghayu et al., 2021).

Comparable trends were observed in India. Singh et al. (2014) reported that 32.8% of adolescents were underweight, 19.5% were stunted, and 26.7% were classified as thin. Overall, malnutrition prevalence among Indian adolescents ranged between 28% and 47% (Singh et al., 2014). In a more recent Indian study, Ragavi (2024) found that 50.5% of adolescents were either underweight (20%), overweight (12%), or obese (18.5%), with the mean nutritional adequacy level estimated at 68.1%.

In Sub-Saharan Africa, adolescent nutrition presents similarly complex challenges. A study conducted in Ethiopia by Hadush, Seid, and Wuneh (2021) identified a thinness prevalence rate of 15.8% (95% CI: 13.3–18.5%) and a stunting rate of 26.6% (95% CI: 23.5–29.9%). In Nigeria, Ogbonna et al. (2024) observed that 27.9% of adolescents were stunted, 12.3% were severely stunted, 14.3% were wasted, and 11.9% were overweight. Complementary evidence from a systematic review by Abubakar, Shahril, and Mat (2024) showed that overweight prevalence among Nigerian adolescents ranged from 0.8% to 31%, while obesity ranged between 0.1% and 14%. Meanwhile, thinness, stunting, and underweight prevalence varied from 3% to 31%, 0.4% to 41.6%, and 0.3% to 73.3%, respectively.

In Ghana, Abdulai et al. (2023) examined adolescents in the Tamale Metropolis and reported underweight, overweight, and obesity rates of 26.1%, 5.2%, and 0.7%, respectively, underscoring the coexistence of both undernutrition and emerging overweight trends among Ghanaian youth.

2.4 Factors Influencing Dietary Habits and Nutritional Status

Adolescent dietary habits and nutritional outcomes are shaped by a multifaceted interaction of social, economic, demographic, and environmental determinants. Understanding these influences is essential for designing effective interventions that enhance adolescent nutrition and promote long-term health (Nagata et al., 2025).

In the United States, Nagata et al. (2025) observed that older adolescents tended to consume slightly fewer fruits, whole grains, and dairy products, but higher levels of monounsaturated fats. Male adolescents exhibited lower intake of fruits, fruit juices, vegetables, whole grains, and fiber, while consuming more meat, poultry, fish, added sugars, and fats compared to females. They also

recorded higher glycemic indices and loads. Moreover, lower parental education, minority ethnic background, and reduced household income were linked with decreased fruit and vegetable intake and higher added sugar consumption (Nagata et al., 2025).

In India, Ragavi (2024) identified social factors as the most dominant influence on adolescents' eating patterns (70.8%), followed closely by environmental factors (69.7%). Similarly, research conducted among Forcibly Displaced Myanmar Nationals (FDMN) adolescents in Bangladesh by Islam et al. (2024) revealed that peer influence, access to nutrition education, food availability, cultural practices, food ration sufficiency, prices, and demographic characteristics such as age, gender, educational attainment, and household income collectively shaped dietary choices and behaviors.

Within Sub-Saharan Africa, several region-specific influences have been documented. Madzorera et al. (2023) found that adolescents whose mothers were unemployed, as opposed to fathers, exhibited lower Global Diet Quality Scores (estimate −2.60; 95% CI: −4.81, −0.39). Conversely, adolescents who engaged in physical activity three to four times weekly had significantly better diet quality (estimate 0.64; 95% CI: 0.11, 1.17).

In Ethiopia, Kahssay, Mohamed, and Gebre (2020) reported that early adolescence (14–15 years) [AOR = 1.4; 95% CI: 1.04–4.28], phone ownership [AOR = 3.3; 95% CI: 1.55–7.02], and limited dietary diversity (fewer than four food groups) [AOR = 2.2; 95% CI: 1.4–4.54] were predictors of stunting. Similarly, inadequate food consumption [AOR = 3.0; 95% CI: 1.15–7.90] and poor dietary diversity [AOR = 1.8; 95% CI: 1.14–4.38] were associated with thinness.

Another Ethiopian study by Arage, Assefa, and Worku (2019) found that rural residence (AOR = 1.34; 95% CI: 1.24–2.33) and not consuming snacks (AOR = 11.39; 95% CI: 1.47–17.8) were significantly associated with higher odds of stunting, while maternal employment appeared to have a protective effect (AOR = 0.12; 95% CI: 0.17–0.87). The same study revealed that rural adolescents (AOR = 2.40; 95% CI: 1.13–5.08) and those aged 14–15 years (AOR = 6.05; 95% CI: 2.15–17.04) were more prone to thinness.

Trübswasser et al. (2022) further demonstrated that higher household asset ownership was positively correlated with greater dietary diversity and consumption of nutritious food groups. In Ghana, Hormenu (2022) found that gender (OR = 1.36, p = 0.007), academic achievement (OR = 2.19, p = 0.001), and geographic location (OR = 1.79, p = 0.001) were significant predictors of adolescent dietary behavior.

Additionally, research conducted in the Tamale Metropolis by Abdulai et al. (2023) indicated that adolescents from lower socio-economic backgrounds were 27% less likely to engage in unhealthy dietary practices compared to those from higher-income households (OR = 0.73; 95% CI: 0.54–0.99; p = 0.04). Males were 2.46 times more likely to be underweight (RRR = 2.46; 95% CI: 1.50–4.04; p = 0.001) but had a 57% lower risk of being overweight or obese (RRR = 0.43; 95% CI: 0.14–1.36; p < 0.001). The same study identified unhealthy dietary patterns, moderate socio-economic status, and maternal unemployment as significant predictors of underweight status among adolescents.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

This chapter outlines the methodological framework and procedures used in examining the dietary behaviours, nutritional conditions, and influencing factors among adolescents attending selected basic schools within the Ashaiman Municipality of Ghana's Greater Accra Region. It details the study design, geographical scope, target participants, sample size determination, and sampling approaches. The section also explains the instruments and techniques utilized in data collection. Furthermore, it discusses the data analysis strategies and the ethical protocols implemented to uphold the reliability, validity, and integrity of the research process.

3.2 Research Methods and Design

A cross-sectional research design was adopted for this study to explore the dietary patterns, nutritional conditions, and associated determinants among adolescents in selected basic schools within the Ashaiman Municipality. This design was deemed appropriate because it enabled the simultaneous evaluation of both exposure and outcome variables, thereby offering a snapshot of the existing nutritional situation of the study population (Setia, 2016). The approach was particularly effective for identifying the prevalence of nutritional indicators and analyzing the relationship between adolescents' dietary practices and influencing factors (Levin, 2006).

3.3 Data Collection Techniques and Tools

Data for the study were gathered through a structured questionnaire administered electronically via the Kobo Collect platform (UN-OCHA, 2024). The questionnaire was designed in alignment

with the research objectives and insights drawn from existing literature on adolescent nutrition. It included mainly closed-ended questions with a few open-ended items, divided into five key sections.

- **Section A: Socio-demographic and Household Characteristics** this section captured participants' socio-demographic and household characteristics such as age, gender, educational level, ethnicity, religion, living conditions, household size, and parental educational attainment.

- **Section B: Dietary Behaviours** examined dietary behaviours, focusing on meal frequency, skipped meals and their causes, meal composition, snacking habits, intake of specific food groups and beverages, and eating outside the home.

- **Section C: Anthropometric Assessments** involved anthropometric assessments, where the researcher measured height and weight to determine participants' nutritional status.

- **Section D: Determinants of Eating Behaviour,** this section explored determinants of eating behaviour, including factors influencing food choices, the role of culture and religion, challenges to healthy eating, and accessibility to nutritious foods.

- **Section E: Lifestyle and Physical Activity,** this section addressed lifestyle and physical activity, covering exercise frequency, time spent on screens, and sleeping patterns. Standardized tools such as digital weighing scales and stadiometers were used for anthropometric measurements. To enhance understanding, the questionnaire was administered in both English and the respondents' native language.

3.4 Study Setting

The research was carried out in three purposively selected basic schools located in the Ashaiman Municipality of the Greater Accra Region, Ghana. The participating schools were Ashaiman No. 5A Basic School, which had an enrolment of approximately 300 students, Blessed Clementina Basic School with 250 students, and Ashaiman Presby A Basic School, enrolling about 220 students. These institutions were intentionally chosen to capture a diverse sample of adolescents from varying socio-economic and geographical settings within the municipality. Their inclusion provided a balanced representation of the adolescent school population in Ashaiman, thereby improving the reliability and applicability of the study's outcomes to the wider adolescent community within the area.

3.5 Study Population

The target population for this research consisted of adolescents of varying ages who were enrolled in the selected basic schools within the Ashaiman Municipality. This age group was chosen because it marks a crucial stage of development characterized by accelerated physical growth, psychological changes, and the formation of enduring dietary behaviours (Lassi, Moin, & Bhutta, 2017; Abdulai et al., 2023). Adolescents were specifically selected for this study, as this phase presents a key window of opportunity for implementing nutritional interventions and preventing diet-related health challenges in adulthood (Lassi, Moin, & Bhutta, 2017).

3.6 Inclusion and Exclusion Criteria

3.6.1 Inclusion Criteria:

- Adolescent students enrolled in the selected basic schools

- Students who provided oral informed consent to participate

- Students who were present on the day of data collection

- Students who were physically and mentally capable of responding to the questionnaire

3.6.2 Exclusion Criteria:

- Students with known chronic illnesses that affected their nutritional status

- Students who were absent from school during the data collection period

- Students who declined to participate in the study

- Students with severe learning disabilities that impaired their ability to understand and respond to questions

3.7 Study Variables

The study examined the relationship between dietary habits, nutritional status, and related factors among adolescents at selected basic schools in the Ashaiman Municipality. For the purpose of this research, the variables were categorized into dependent and independent variables.

3.7.1 Dependent Variables

The study's dependent variables included adolescents' dietary habits and nutritional status. Dietary habits encompassed the general patterns of food intake, such as meal frequency, food selection, and the extent to which individuals adhered to dietary recommendations. Nutritional status was determined using anthropometric indicators specifically Body Mass Index (BMI) for age to classify participants as undernourished, of normal weight, or overweight/obese. These measures represented the principal outcome variables that the study aimed to assess and interpret.

3.7.2 Independent Variables

The independent variables in this study comprised a range of socio-demographic, interpersonal, and environmental factors that could affect adolescents' eating behaviours and nutritional outcomes. These included characteristics such as age, gender, educational attainment, household income, parental education, family size, and availability of food resources. Additional considerations were given to lifestyle patterns, nutrition knowledge, and cultural food preferences. Collectively, these factors formed the foundation for analysing the associations and potential predictors influencing dietary habits and nutritional status within the study group.

3.8 Sampling

Stratified random sampling technique was employed to ensure proportional representation from each of the three selected schools. The sample size was calculated using the Cochran formula *(Snedecor and Cochran, 1989)* for cross-sectional studies. An assumed prevalence of 50% was used in the sample size calculation to ensure the maximum required sample size, as the study investigated multiple outcomes and no single prevalence from existing literature was considered sufficiently representative of all the study objectives.

The Cochran formula for sample size calculation in cross-sectional studies is:

$$n = \frac{Z^2 \times p \times (1-p)}{(e)^2}$$

where:

n = required sample size

z = reliability co-efficient (1.96 for 95% confidence interval)

p = expected prevalence (0.50 or 50%)

e = margin of error (5% or 0.05)

n = (1.96) ^{2} × 0.50 × 0.50 / (0.05)^2

n = 3.8416 × 0.50 × 0.50 / 0.0025

n = 3.8416 × 0.25 / 0.0025

n = 0.9604 / 0.0025

n = 384.16 ≈ 384

Assuming a 10% non-response rate, the adjusted sample size was:

= 384 x 0.10 = 38.4 +384 = 422

Therefore, the required sample size was **422 participants**.

The sample was proportionally allocated across the three schools based on their respective enrollment numbers using the formula:

$$n = \frac{\text{School Enrollment}}{\text{Total Enrollment}} \ x \ \text{Total Sample Size}$$

Total enrollment = 300 + 250 + 220 = 770 students

Table 1 Proportional Sample Allocation by School

School Name	Total Enrollment	Proportional Allocation of Sample Size
Ashaiman No.5A Basic School	300	300/770 x 422 = 164
Blessed Clementina Basic School	250	250/770 x 422 = 137
Ashaiman Presby A Basic School	220	220/770 x 422 = 121
Total	**770**	**422**

An approximately equal gender distribution in basic schools (50% male, 50% female) was considered, and the sample was further stratified by gender within each school.

Table 2 Sample Allocation by School and Gender

School Name	Total Sample	Male (50%)	Female (50%)
Ashaiman No.5A Basic School	164	82	82
Blessed Clementina Basic School	137	68	69
Ashaiman Presby A Basic School	121	60	61
Total	**422**	**210**	**212**

Random selection within each school was conducted with the assistance of teachers, who were instructed to select students while maintaining an equal gender distribution (50% male and 50% female). Due to circumstances beyond the researcher's control, the sampling frame was not prepared from the enrollment registers of each school as initially planned hence the reliance on teacher's facilitation.

3.9 Pretesting

A pilot test of the questionnaire was carried out with 30 adolescents from a basic school within the Ashaiman Municipality but not included in the main study sites. This exercise aimed to evaluate the clarity, suitability, and ease of understanding of the questionnaire items, as well as to verify the operational efficiency of the KoboToolbox data collection system. Feedback obtained from the pilot test guided revisions to the instrument, leading to the correction of unclear or culturally insensitive questions. The pretesting phase also provided insights into the average duration required for data collection and potential logistical challenges. Adjustments were subsequently implemented to enhance the reliability and effectiveness of the tool prior to the commencement of the main field data collection.

3.10 Data Handling

All information gathered through KoBoToolbox was automatically encrypted and securely stored on password-protected servers. Only authorized members of the research team were granted access to the dataset, and each participant was assigned a unique identification code to maintain anonymity. Immediately after data collection, all personal identifiers were removed to safeguard confidentiality. To prevent potential data loss, backup copies were created and stored in several secure locations. The research team strictly followed established data protection procedures

throughout the study, with all data scheduled to be kept for five years in accordance with institutional guidelines before being permanently deleted. Routine quality checks were also performed to detect and correct any inconsistencies or missing entries in the dataset.

3.11 Data Analysis

The collected data were analyzed using STATA version 18 (StataCorp, 2023). Descriptive analyses, including frequencies, percentages, means, and standard deviations, were applied to summarize participants' characteristics and study variables. A composite dietary habits score was developed based on seven indicators: (1) consuming at least three meals daily, (2) regular breakfast intake (6–7 days per week), (3) frequent fruit consumption (five or more days per week), (4) frequent vegetable consumption (five or more days per week), (5) limited sugary drink consumption (two or fewer days per week), (6) adequate daily water intake (seven or more glasses), and (7) healthy snacking choices such as fruits or vegetables. Each indicator was awarded one point if the condition was met, resulting in a total score ranging from 0 to 7. Participants with scores of four or more were categorized as having a *healthy diet*, while those scoring below four were classified as having an *unhealthy diet*.

Nutritional status was determined using Body Mass Index-for-Age Z-scores (BAZ), calculated in accordance with the WHO 2007 Growth Reference for children and adolescents aged 5–19 years (Mramba et al., 2017). Classification thresholds were: severe thinness (BAZ < –3 SD), thinness (–3 SD to < –2 SD), normal weight (–2 SD to +1 SD), overweight (+1 SD to +2 SD), and obesity (> +2 SD). Physical activity was assessed based on the number of days per week respondents engaged in moderate or vigorous exercise. Responses were grouped into two categories: *regular physical*

activity (five or more days per week) and *insufficient physical activity* (fewer than five days per week).

In addition to analyzing socio-demographic characteristics, bivariate analyses were conducted to explore relationships between dietary habits (such as meal frequency, breakfast, lunch, and supper patterns, meal skipping, snacking behavior, eating outside the home, and water intake), lifestyle factors (including exercise, screen time, and sleep duration), and the outcome variables (healthy diet status and BAZ classifications). Although several associations were found to be weak or statistically insignificant, all relevant predictors were included in the multivariate regression models to adjust for confounding effects. The results of these models are reported as odds ratios (ORs) with 95% confidence intervals (CIs), and statistical significance was defined at a p-value of less than 0.05.

3.12 Ethical Considerations

Prior to the commencement of data collection, ethical clearance for the study was granted by the Institutional Review Board of Ensign Global University. In addition, authorization was obtained from the Ghana Education Service Directorate and the administrations of the participating schools before engaging any participants. All participants provided oral informed consent after being thoroughly briefed on the objectives of the study, the data collection procedures, potential benefits and risks, and their right to withdraw from participation at any stage without any form of penalty. For respondents below 18 years of age, parental consent was obtained along with the assent of the students themselves to ensure ethical compliance. Strict measures were implemented to uphold confidentiality and anonymity throughout the research process. No personal identifiers were used

in data entry, analysis, or reporting. All collected information was securely stored and accessible only to authorized members of the research team.

3.13 Limitations of Study

This research encountered several limitations that may have affected the interpretation of its results. To begin with, the study was conducted exclusively among adolescents enrolled in a few selected basic schools within the Ashaiman Municipality, thereby restricting the generalizability of the findings to the wider adolescent population, especially those who are not in school. Furthermore, the cross-sectional nature of the study limited the ability to draw causal inferences between adolescents' dietary behaviors, nutritional status, and influencing factors. The use of self-reported information for dietary assessment also introduced potential recall and social desirability biases, which could have affected the accuracy of responses. Finally, due to limited resources and time, data collection was confined to anthropometric measurements, without incorporating biochemical or clinical evaluations of nutritional status, which might have provided a more comprehensive understanding of adolescents' nutrition and health profiles.

3.14 Assumptions

This study was based on several assumptions that guided its design and implementation. It also assumed that respondents provided accurate and honest information regarding their dietary practices and socio-demographic characteristics during data collection. Furthermore, the study assumed that the anthropometric indicators used are valid and reliable measures for assessing nutritional status in adolescents.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

This chapter outlines the results of the investigation into the dietary habits, nutritional status, and influencing factors among adolescents in selected basic schools within the Ashaiman Municipality. The findings are structured according to the study's specific objectives and include univariate, bivariate, and multivariate analyses that explore relationships between socio-demographic variables, dietary behaviors, and nutritional outcomes. Both descriptive and inferential statistical methods were employed to analyze the data, with the results presented through tables, figures, and charts to enhance clarity and interpretation. Notably, the survey achieved a 100% response rate, ensuring comprehensive participation from all selected respondents.

4.2 Socio-demographic Characteristics of Respondents

A total of 422 adolescents participated in the study, with a mean age of 12.36 ± 1.62 years, indicating a predominantly younger adolescent population. The research covered three basic schools in the Ashaiman Municipality. Although Chapter Three outlined the intended sample sizes—Ashaiman No.5A Basic School (164), Blessed Clementina Basic School (137), and Ashaiman Presby A Basic School (121) minor deviations occurred during fieldwork due to differences in availability and willingness to participate. Ultimately, Ashaiman No.5A Basic School contributed the largest share of respondents (40.1%, n=169), followed by Blessed Clementina Basic School (36.0%, n=152) and Ashaiman Presby A Basic School (23.9%, n=101).

Table 4.1 summarizes the socio-demographic characteristics of participants. In terms of age, 52.4% (n=221) were between 10–12 years, 44.5% (n=188) fell within 13–15 years, and only 3.1% (n=13) were aged 16–18 years. Gender distribution was nearly even, with females accounting for 51.2% (n=216) and males 48.8% (n=206).

Regarding educational levels, respondents were drawn from both primary and junior high schools. The largest proportion were JHS 1 students (23.9%, n=101), followed closely by Primary 5 (22.5%, n=95) and Primary 6 (21.3%, n=90). JHS 2 students represented 21.8% (n=92), while JHS 3 (7.1%, n=30) and Primary 4 (3.3%, n=14) had fewer participants.

The ethnic composition reflected Ghana's cultural diversity. The Ga-Dangme group formed the largest proportion (37.4%, n=158), followed by Ewe (28.0%, n=118), Akan (24.6%, n=104), and Mole-Dagbani (9.7%, n=41). A negligible 0.2% (n=1) belonged to other ethnic backgrounds.

In terms of religion, Christians dominated the sample (84.8%, n=358), while Muslims comprised 10.9% (n=46), and traditional religion adherents represented 4.3% (n=18).

The family structure analysis indicated that most respondents (60.9%, n=257) lived with both parents, suggesting relatively stable family conditions. About 24.6% (n=104) lived with one parent, and 14.0% (n=59) stayed with guardians, while a small fraction (0.5%, n=2) lived alone or under other arrangements.

Household size averaged 4.69 ± 1.94 persons. Most participants came from small households (1–3 members, 43.6%, n=184), followed by medium-sized (4–6 members, 36.5%, n=154), and large households (≥7 members, 19.9%, n=84).

Regarding parental education, fathers were most likely to have completed Junior High School (30.8%, n=130) or Senior High School (27.5%, n=116). However, 15.2% (n=64) had no formal education, 14.9% (n=63) had only primary education, and 11.6% (n=49) attained tertiary education. Mothers displayed a similar pattern, with the majority holding Junior High School education (40.1%, n=169), followed by Senior High School (19.4%, n=82). About 16.6% (n=70) had no formal education, 15.9% (n=67) completed primary education, and 8.1% (n=34) attained tertiary education.

Table 3 Sociodemographic Characteristics of Respondents

Variables	Frequency (N=422)	Percentages (%)
Mean age of respondents 12.36 ± 1.62		
Age groups (years)		
10 – 12	221	52.4
13 – 15	188	44.5
16 – 18	13	3.1
Gender		
Male	206	48.8
Female	216	51.2
Class level		
Primary 4	14	3.3
Primary 5	95	22.5

Primary 6	90	21.3
JHS 1	101	23.9
JHS 2	92	21.8
JHS 3	30	7.1

Name of School

Ashaiman No.5A Basic School	169	40.1
Ashaiman Presby A Basic School	101	23.9
Blessed Clementina Basic School	152	36.0

Ethnicity

Akan	104	24.6
Ewe	118	28.0
Ga-Dangme	158	37.4
Mole-Dagbani	41	9.7
Other	1	0.2

Religion

Christianity	358	84.8
Islam	46	10.9
Traditional	18	4.3

Who do you live with?

Both parents	257	60.9
One parent	104	24.6
Guardian	59	14.0
Other	2	0.5

Household size (mean 4.69 ± 1.94)

Small (1-3)	184	43.6
Medium (4-6)	154	36.5
Large (7+)	84	19.9

Father's highest level of education

No formal education	64	15.2
Primary	63	14.9
Junior High School (JHS)	130	30.8
Senior High School (SHS)	116	27.5
Tertiary	49	11.6

Mother's highest level of education

No formal education	70	16.6
Primary	67	15.9
Junior High School (JHS)	169	40.1
Senior High School (SHS)	82	19.4
Tertiary	34	8.1

4.3 Dietary Practices of Respondents

The analysis of respondents' dietary practices revealed a variety of eating habits and food consumption patterns (see Tables 4.2 and 4.3). With respect to meal frequency, most adolescents (71.09%) reported consuming three meals daily, consistent with general nutritional guidelines. However, 14.93% indicated eating two meals per day, and 11.85% ate more than three meals daily, while a small minority (2.13%) consumed only one meal per day.

When exploring meal skipping behaviors, breakfast (41.94%) and lunch (41.23%) were identified as the most frequently skipped meals. In contrast, supper was the least commonly missed meal, with only 16.82% of participants indicating that they skipped it regularly.

Across the week, meal frequency patterns remained relatively stable. For breakfast, 44.55% of participants ate it 6–7 days per week, while 28.20% consumed breakfast 4–5 days weekly. A similar trend was observed for lunch, with 47.39% eating it 6–7 days weekly. Supper was the most consistently eaten meal, with 49.29% consuming it almost every day.

Snacking was moderately practiced, as 42.89% of participants reported snacking between meals, whereas 57.11% did not. Eating outside the home was primarily limited to weekdays as 74.17% did so only on weekdays, while 12.32% ate outside daily, and a very small fraction (0.47%) reported never eating outside their homes.

Patterns in water intake showed that most respondents drank sufficient quantities. About 38.86% consumed 3–4 glasses daily, while 22.04% reported drinking 7–8 glasses per day. A smaller

proportion (15.64%) drank more than 8 glasses, and 4.74% reported drinking only 1–2 glasses per day, which may be inadequate.

Analysis of food group consumption over the past week revealed variation across different food types. Rice was a staple, with 42.65% consuming it 4–5 times weekly and 31.04% eating it 6–7 days per week. Similarly, bread and biscuits were consumed 4–5 times per week by 36.97% of respondents.

Vegetable intake was moderate, as 36.73% reported consuming vegetables 4–5 times weekly, while only 21.80% ate them daily. Fruit consumption showed similar results, with 36.73% (n=155) consuming fruits 4–5 times per week and 22.75% eating fruits every day.

Protein-rich foods such as fish and meat were frequently consumed, as 44.55% of participants ate them 4–5 times weekly, and 26.78% consumed them daily. However, consumption of sugar-sweetened beverages was relatively high, with 35.78% drinking them 2–3 days weekly, and 34.83% consuming them 4–5 days weekly, raising potential dietary concerns.

When asked about reasons for skipping meals, financial constraints were the most frequently cited, with 40.0% indicating they skipped meals to save money. The second most common reason was lack of hunger (38.6%). Additionally, 29.4% attributed meal skipping to lack of available food and insufficient time. Weight control was a less common factor (15.2%), while food preference played a moderate role, as 20.1% (n=85) reported skipping meals because they disliked available food options.

In terms of breakfast preferences, most respondents (63.5%) consumed porridge-based dishes such as *koko* or *Hausa koko*. Bread and tea were the second most common choice (41.7%), followed by

rice or waakye (39.1%). Fried foods such as *koose* and *bofrot* were eaten by 38.6%. However, fruit intake during breakfast was notably low, with only 4.7% including fruits in their morning meals.

Analysis of snacking patterns revealed that biscuits and cookies were the most popular (27.3%), followed by fried snacks (19.2%). Soft drinks were consumed by 16.8%, while healthier options such as fresh fruits (8.1%) and vegetables (1.4%) were the least favored snack choices.

Regarding foods purchased outside the home, banku (23.9%) and kenkey (22.7%) were the most commonly bought. Fried yam was purchased by 19.2%, and rice dishes by 15.9%. Processed foods like *Indomie* noodles accounted for 7.6% of purchases. Similar to snack trends, fruits (5.0%) and drinks (4.3%) had the lowest purchase rates.

Table 4 Responses to Questions on Dietary Habits

Questions	Frequency (N=422)	Percentages (%)
How many meals do you eat in a typical day?		
1	9	2.13
2	63	14.93
3	300	71.09
More than 3	50	11.85
Which meal do you skip most often?		
Breakfast	177	41.94
Lunch	174	41.23
Supper	71	16.82
How often do you eat breakfast in a week?		
0-1 days	14	3.32
2-3 days	101	23.93
4-5 days	119	28.20

6-7 days	188	44.55

How often do you eat lunch in a week?

0-1 days	13	3.08
2-3 days	71	16.82
4-5 days	138	32.70
6-7 days	200	47.39

How often do you eat supper in a week?

0-1 days	11	2.61
2-3 days	97	22.99
4-5 days	106	25.12
6-7 days	208	49.29

Do you snack between meals?

No	241	57.11
Yes	181	42.89

How often do you eat food outside your home?

Every day	52	12.32
Never	2	0.47
Once a week	32	7.58
Weekdays only	313	74.17
Weekends only	23	5.45

How many glasses of water do you drink per day?

1-2 glasses	20	4.74
3-4 glasses	164	38.86
5-6 glasses	79	18.72
7-8 glasses	93	22.04
More than 8 glasses	66	15.64

How many days in the past week did you eat rice?

0-1 days	20	4.74
2-3 days	90	21.33
4-5 days	180	42.65
6-7 days	131	31.04

How many days in the past week did you eat bread/biscuits?		
0-1 days	32	7.58
2-3 days	125	29.62
4-5 days	156	36.97
6-7 days	109	25.83
How many days in the past week did you eat vegetables?		
0-1 days	42	9.95
2-3 days	132	31.28
4-5 days	155	36.73
6-7 days	92	21.80
How many days in the past week did you eat fruits?		
0-1 days	44	10.43
2-3 days	127	30.09
4-5 days	155	36.73
6-7 days	96	22.75
How many days in the past week did you eat fish/meat?		
0-1 days	13	3.08
2-3 days	108	25.59
4-5 days	188	44.55
6-7 days	113	26.78
How many days in the past week did you drink sugary drinks?		
0-1 days	46	10.90
2-3 days	151	35.78
4-5 days	147	34.83
6-7 days	78	18.48

Source: Field Survey, 2025

Table 5 Responses to Questions on Dietary Habits (Multiple Response)

Questions	Frequency (N=422)	Percentage (%)
Why do you skip meals?	N	N (%)
No food available	124	29.4
Not hungry	163	38.6
To save money	169	40.0
Want to lose weight	64	15.2
Dislike food	85	20.1
No time	124	29.4
Other reasons	3	0.7
What do you usually eat for breakfast?	N	N (%)
Bread/Tea	176	41.7
Porridge (e.g., koko, hausa koko)	268	63.5
Rice/Waakye	165	39.1
Fruits	20	4.7
Fried foods (e.g., koose, bofrot)	163	38.6
Other breakfast foods	2	0.5
What types of snacks do you eat most often?	N	N (%)
Fruits	34	8.1
Biscuits/Cookies	115	27.3
Toffees/Candy	17	4.0
Carbonated drinks	71	16.8
Vegetables	6	1.4

Fried foods	81	19.2
Other snacks	241	57.1
What foods do you usually buy outside?	N	N (%)
Rice	67	15.9
Kenkey	96	22.8
Banku	101	23.9
Fried Yam	81	19.2
Indomie	32	7.6
Fruits	21	5.0
Drinks	18	4.3
Other outside foods	3	0.7

Source: Field Survey, 2025

4.4 Nutritional Status of Respondents

Table 4.4 presents the nutritional status assessment of respondents across various categories, with notable variations by key demographic characteristics. Overall, the majority of participants (47.87%) exhibited normal nutritional status. However, a substantial proportion of respondents presented with nutritional concerns, as 44.31% were classified as either overweight or obese, with 23.93% (n=101) being overweight and 20.38% being obese. Conversely, undernutrition was less prevalent, affecting 7.82% of the sample, comprising 4.27% with severe thinness and 3.55% with thinness (Figure 4.1).
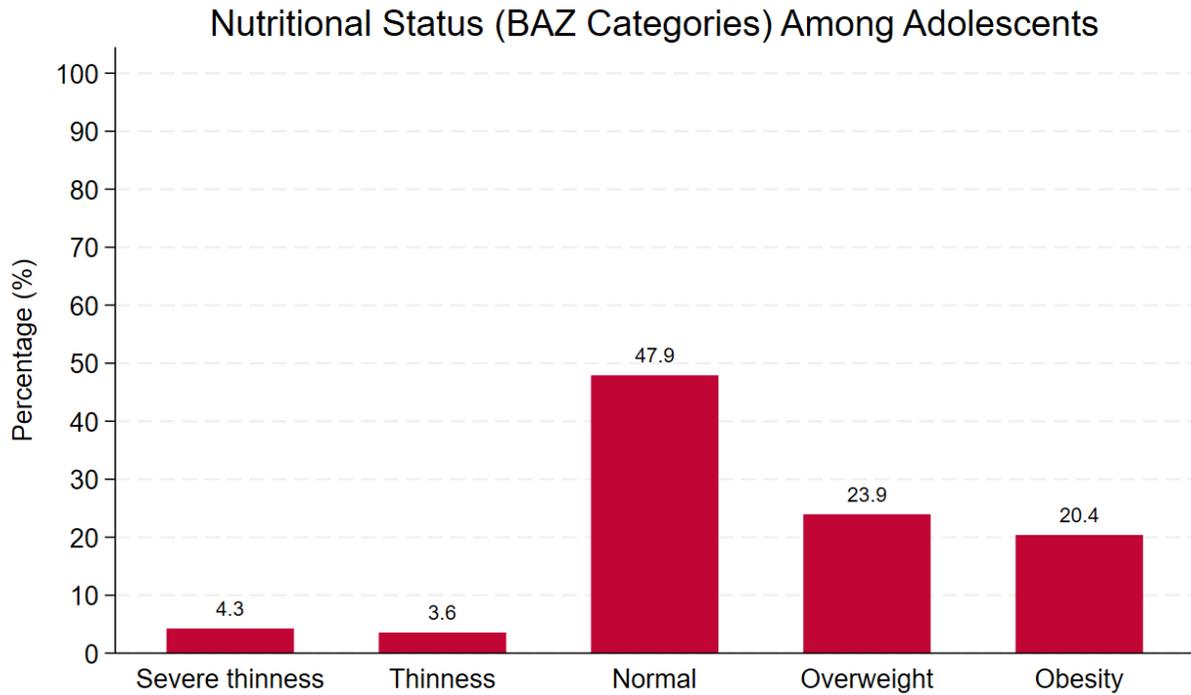
Figure 3 Nutritional Status Among Respondents

Within the 10–12-year age group, obesity was most prevalent, accounting for 66.28% of all participants identified as obese. The 13–15-year age group had the largest overall representation across most nutritional categories and exhibited the highest proportions of both severe thinness (50.00%) and overweight (51.49%). In contrast, adolescents aged 16–18 years constituted a small portion of the sample across all nutritional categories, with the majority within this group classified as having a normal weight (3.96%).

Gender-based analysis revealed distinct patterns. Among participants with severe thinness, males and females were equally represented (50.00% each). However, females exhibited higher rates of thinness (66.67%) and normal nutritional status (55.45%) compared to males (33.33% and 44.55%,

respectively). Conversely, males had a greater prevalence of overweight (51.49%) and obesity (58.14%), while females accounted for 48.51% and 41.86%, respectively.

In terms of school-based distribution, Ashaiman No.5A Basic School had the highest overall representation (40.05%) and showed a fairly balanced spread across all nutritional categories. Although Ashaiman Presby A Basic School contributed the smallest proportion of participants (23.93%), it recorded relatively lower instances of severe thinness (22.22%) and thinness (20.00%) compared with the other schools. Blessed Clementina Basic School showed intermediate distributions, with rates of severe thinness (38.89%) and obesity (36.05%) similar to those observed in Ashaiman No.5A Basic School.

Dietary habits were assessed using a composite index developed from several dietary behavior indicators, including meal frequency, breakfast regularity, fruit and vegetable intake, sugary drink consumption, and daily water intake. The resulting score was dichotomized into a binary variable termed "Healthy Diet." Participants with higher scores were classified as having healthier eating behaviors. Out of the 422 adolescents surveyed, 243 (57.6%) were identified as following a healthy diet, while 179 (42.4%), representing just over two-fifths of the respondents, were categorized as having an unhealthy diet (see Figure 4.2).

Distribution of Healthy Diet Status
Among Adolescents (n=422)

42.42%

57.58%

- Unhealthy Diet
- Healthy Diet
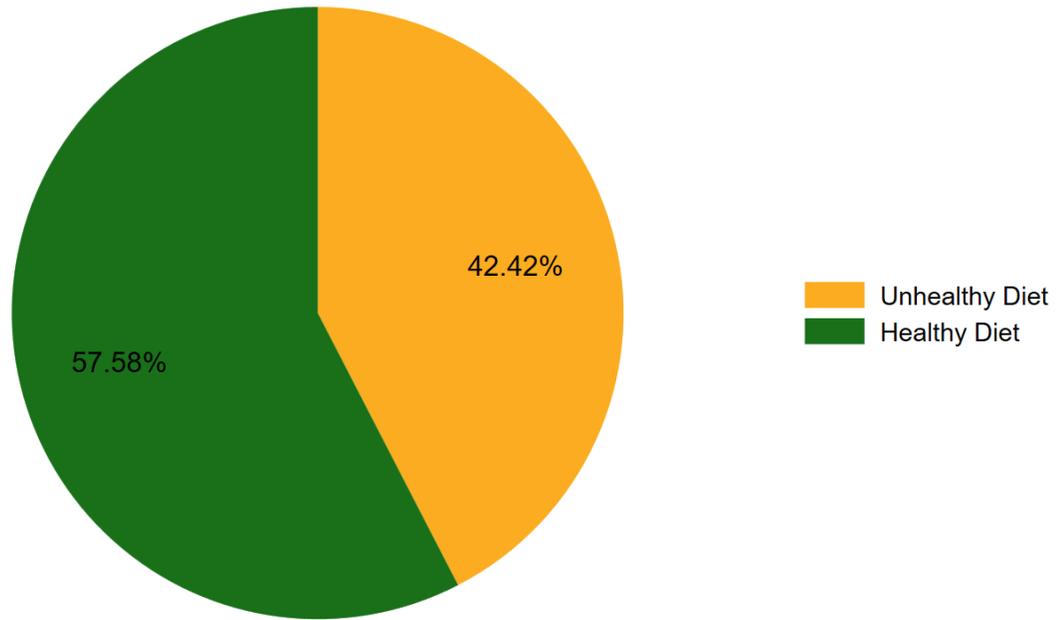
Figure 4 Distribution of Healthy Diet Status

Table 6 Nutritional status of Respondents

Variables	Frequency (N=422)	Percentages (%)
Overall Nutritional Status		
Severe thinness	18	4.27
Thinness	15	3.55
Normal	202	47.87
Overweight	101	23.93
Obesity	86	20.38
Nutritional Status by Age Group		
Age Group: (10-12 years)		
Severe thinness	7	38.89

Thinness	12	80.00
Normal	97	48.02
Overweight	48	47.52
Obesity	57	66.28

Age Group: (13-15 years)

Severe thinness	9	50.00
Thinness	3	20.00
Normal	97	48.02
Overweight	52	51.49
Obesity	27	31.40

Age Group: (16-18 years)

Severe thinness	2	11.11
Thinness	0	0.00
Normal	8	3.96
Overweight	1	0.99
Obesity	2	2.33

Nutritional Status by Sex

Sex: Male

Severe thinness	9	50.00
Thinness	5	33.33
Normal	90	44.55
Overweight	52	51.49
Obesity	50	58.14

Sex: Female

Severe thinness	9	50.00
Thinness	10	66.67
Normal	112	55.45
Overweight	49	48.51
Obesity	36	41.86

Nutritional Status by School

(Ashaiman No.5A Basic School)

Severe thinness	7	38.89
Thinness	7	46.67
Normal	86	42.57
Overweight	35	34.65
Obesity	34	39.53

(Ashaiman Presby A Basic School)

Severe thinness	4	22.22
Thinness	3	20.00
Normal	44	21.78
Overweight	29	28.71
Obesity	21	24.42

(Blessed Clementina Basic School)

Severe thinness	7	38.89
Thinness	5	33.33
Normal	72	35.64
Overweight	37	36.63
Obesity	31	36.05

Tables 4.5 and 4.6 summarize the analysis of the key factors that influence adolescents' dietary habits and nutritional outcomes. As illustrated in the tables, parents and guardians were primarily responsible for food procurement and preparation decisions, accounting for 91.0% of reported cases. Only a small proportion of respondents (4.27%) indicated that they made their own independent food choices, while another 4.27% stated that school feeding programs determined their daily meals. This finding highlights the strong external influence on adolescents' dietary behaviors, particularly within family and institutional contexts. Cultural and religious beliefs were also observed to shape eating behaviors for a notable subset of participants. Over one-third (35.5%) reported that such beliefs directly affected their diets, whereas nearly two-thirds (64.45%) indicated that these factors did not play a role in their food choices. Participants identified several barriers to maintaining healthy eating habits (see Figure 4.3). The most frequently mentioned challenge was taste preference (44.3%), followed by the limited availability of healthy food options (37.0%) and family dietary influences (36.5%). Other notable constraints included high food costs (17.8%), limited nutrition knowledge (18.2%), and time constraints (15.6%). Interestingly, nearly one in five respondents (18.7%) stated that they encountered no barriers to healthy eating. Regarding food accessibility, most participants (68.5%) reported living 10–30 minutes from the nearest market or food source, indicating generally good physical access to food. However, 19% of respondents faced longer travel times of over 30 minutes, while a smaller proportion (13%) had immediate access within 10 minutes.

4.5 Factors Associated with Dietary Habits and Nutritional Outcomes
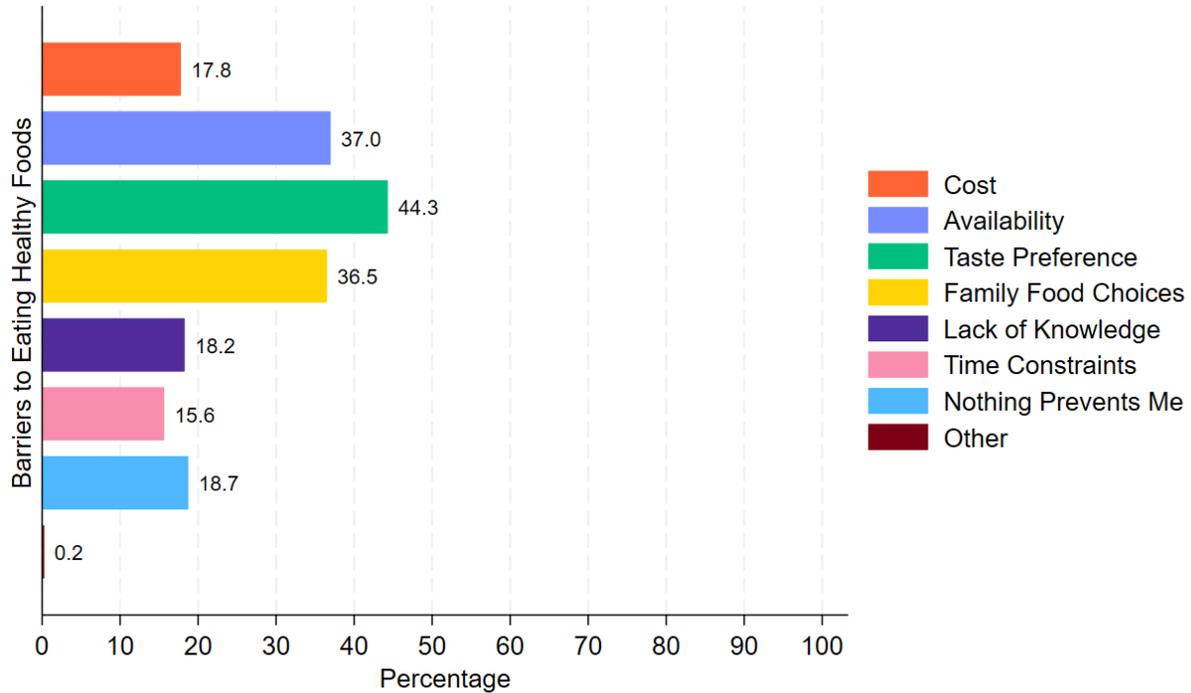
Figure 5 Barriers to Healthy Eating

In spite of the identified barriers, more than half of the adolescents (55.9%) perceived their current eating habits as healthy, whereas 44.08% recognized shortcomings in their dietary practices. The study further explored lifestyle behaviors that may influence nutritional outcomes. Findings on physical activity revealed generally positive trends, with the largest proportion of respondents (35.55%) engaging in exercise three to four times per week, and an additional 23.22% participating in physical activity five to six days weekly. Nonetheless, almost one-third (31.28%) reported exercising only once or twice per week, while a small fraction (5.45%) were not physically active at all. Patterns of screen time indicated less favorable habits, as 37.68% of participants spent between three and four hours daily on television or digital devices, and 25.12% exceeded this duration. Only 11.61% reported maintaining limited screen exposure of under one hour per day. With regard to sleep duration, most adolescents reported sufficient rest, with 43.60% sleeping for six to seven hours per night and 30.81% achieving between eight and nine hours. However, 21.09% indicated inadequate sleep of fewer than six hours nightly.

Table 7 Factors Associated with Dietary Habits and Nutritional Outcomes

Factor	Category	Frequency (N)	Percentage (%)
Decision maker for food choices			
	Myself	18	4.3
	Other	2	0.5
	Parents/Guardians	384	91.0
	School	18	4.3
Cultural/religious influence on diet			
	No	272	64.5
	Yes	150	35.5
Distance to nearest market			
	Less than 10 minutes	53	12.6
	10-30 minutes	289	68.5
	More than 30 minutes	80	19.0
Perception of current diet healthiness			
	No	186	44.1
	Yes	236	55.9
Days of physical activity per week			
	0 days	23	5.5
	1-2 days	109	25.8
	3-4 days	150	35.5
	5-6 days	98	23.2
	7 days	42	10.0
Screen time per day			
	Less than 1 hour	49	11.6
	1-2 hours	108	25.6
	3-4 hours	159	37.7
	5-6 hours	88	20.9
	More than 6 hours	18	4.3
Average hours of sleep per night			
	Less than 6 hours	89	21.1
	6-7 hours	184	43.6
	8-9 hours	130	30.8
	More than 9 hours	19	4.5

Source: Field Survey, 2025

Table 8 Barriers to Eating Healthy Among Respondents (Multiple Response)

Questions	Frequency(N=422)	Percentage(%)
	N	N(%)
Cost	75	17.8
Availability	156	37.0
Taste preference	187	44.3
Family food choices	154	36.5
Lack of knowledge	77	18.2
Time constraints	66	15.6
Nothing prevents me	79	18.7
Other Barriers	1	0.2

Source: Field Survey, 2025

4.6 Bivariate Analysis of the Association between Sociodemographic Variables andDietary Habits (Healthy Diet)

A bivariate analysis was performed using Pearson's Chi-square test to explore the relationships between dietary health status and selected socio-demographic characteristics. The outcomes of this analysis are summarized in Table 4.7, revealing several statistically significant associations. Age group demonstrated a meaningful relationship with diet quality ($\chi^2 = 8.70$, $p = 0.013$). The proportion of adolescents reporting a healthy diet was highest among those aged 10–12 years (62.0%), declined to 54.8% in the 13–15-year group, and dropped sharply to 23.1% among

respondents aged 16–18 years. A similar trend was observed in relation to academic level, where a significant association was noted (χ^2 = 16.02, p = 0.007). Students in JHS 3 exhibited the greatest prevalence of healthy eating (90.0%), whereas those in Primary 4 had the lowest (42.9%). Living arrangement and family structure also proved to be strong determinants of dietary outcomes, showing a highly significant relationship (χ^2 = 33.67, p < 0.001). Adolescents residing with both parents reported the highest incidence of healthy diets (68.5%), compared to those living with one parent (39.4%) or a guardian (44.1%). Additionally, household size was linked to dietary health (χ^2 = 19.07, p < 0.001), with adolescents from medium-sized households (4–6 members) displaying the most favorable diet patterns (71.4%), followed by those from smaller (50.0%) and larger (48.8%) households. Parental education, particularly the mother's educational level, was another significant predictor (χ^2 = 20.68, p = 0.001). The likelihood of maintaining a healthy diet increased progressively with higher maternal education from 42.9% among adolescents whose mothers had no formal schooling to 81.8% among those whose mothers held tertiary qualifications. In contrast, the father's education level did not show a statistically significant relationship with dietary health (p = 0.223).

Lastly, the decision-making authority for household food procurement was found to influence dietary outcomes (χ^2 = 9.80, p = 0.020). Diets were most nutritious when parents or guardians managed food decisions (59.4% healthy) and least so when adolescents made their own choices (27.8%). However, no significant associations were observed between diet healthiness and sex (p = 0.786), ethnicity (p = 0.248), or religion (p = 0.143).

Table 9 Bivariate Analysis of the Association between Sociodemographic Variables and Dietary Habits (Healthy Diet)

Variables	Dietary Habits (Healthiness of Diet)			χ² (p-Value)
	Unhealthy N (%)	**Healthy** N (%)	**Total** N (%)	
Sex				0.0739 (0.786)
Male	86 (41.75)	120 (58.25)	206 (100.00)	
Female	93 (43.06)	123 (56.94)	216 (100.00)	
Age Group				8.6969 **(0.013)**
10-12 years	84 (38.01)	137 (61.99)	221 (100.00)	
13-15 years	85 (45.21)	103 (54.79)	188 (100.00)	
16-18 years	10 (76.92)	3 (23.08)	13 (100.00)	
Class				16.0150 **(0.007)**
JHS 1	41 (40.59)	60 (59.41)	101 (100.00)	
JHS 2	41 (44.57)	51 (55.43)	92 (100.00)	
JHS 3	3 (10.00)	27 (90.00)	30 (100.00)	
Primary 4	8 (57.14)	6 (42.86)	14 (100.00)	
Primary 5	46 (48.42)	49 (51.58)	95 (100.00)	
Primary 6	40 (44.44)	50 (55.56)	90 (100.00)	
Ethnicity				5.4030 (0.248)
Akan	52 (50.00)	52 (50.00)	104 (100.00)	
Ewe	45 (38.14)	73 (61.86)	118 (100.00)	
Ga-Dangme	62 (39.24)	96 (60.76)	158 (100.00)	
Mole-Dagbani	20 (48.78)	21 (51.22)	41 (100.00)	
Other	0 (0.00)	1 (100.00)	1 (100.00)	
Religion				3.8962 (0.143)
Christianity	159 (44.41)	199 (55.59)	358 (100.00)	
Islam	14 (30.43)	32 (69.57)	46 (100.00)	

Traditional	6 (33.33)	12 (66.67)	18 (100.00)	
Who do you live with?				33.6693 **(<0.001)**
Both parents	81 (31.52)	176 (68.48)	257 (100.00)	
Guardian	33 (55.93)	26 (44.07)	59 (100.00)	
One parent	63 (60.58)	41 (39.42)	104 (100.00)	
Other	2 (100.00)	0 (0.00)	2 (100.00)	
Household Size Categories				19.0657 **(<0.001)**
Small (1-3)	92 (50.00)	92 (50.00)	184 (100.00)	
Medium (4-6)	44 (28.57)	110 (71.43)	154 (100.00)	
Large (7+)	43 (51.19)	41 (48.81)	84 (100.00)	
Father's highest level of Education				6.9723 (0.223)
No formal education	30 (46.88)	34 (53.12)	64 (100.00)	
Primary	30 (50.00)	30 (50.00)	60 (100.00)	
Junior High School (JHS)	57 (43.85)	73 (56.15)	130 (100.00)	
Senior High School (SHS)	46 (39.66)	70 (60.34)	116 (100.00)	
Tertiary	14 (28.57)	35 (71.43)	49 (100.00)	
Other	2 (66.67)	1 (33.33)	3 (100.00)	
Mother's highest level of education				20.6825 **(0.001)**
No formal education	40 (57.14)	30 (42.86)	70 (100.00)	
Primary	33 (49.25)	34 (50.75)	67 (100.00)	
Junior High School (JHS)	73 (43.20)	96 (56.80)	169 (100.00)	
Senior High School (SHS)	26 (31.71)	56 (68.29)	82 (100.00)	
Tertiary	6 (18.18)	27 (81.82)	33 (100.00)	
Other	1 (100.00)	0 (0.00)	1 (100.00)	
Who decides what food to buy and prepare at home?				9.7970 **(0.020)**
Parents/Guardians	156 (40.62)	228 (59.38)	384 (100.00)	
Myself	13 (72.22)	5 (27.78)	18 (100.00)	

School	8 (44.44)	10 (55.56)	18 (100.00)
Other	2 (100.00)	0 (0.00)	2 (100.00)
Overall Total	**179 (42.42)**	**243 (57.58)**	**422 (100.00)**

4.7 Bivariate Analysis of the Association between Nutritional Status and Sociodemographic Variables

A bivariate analysis was performed to evaluate the relationships between Body Mass Index-for-Age z-score (BAZ) classifications and selected socio-demographic factors. The outcomes, presented in Table 4.8, revealed significant associations between nutritional status and variables such as age group, academic level, and household food decision-making authority ($p < 0.05$). Conversely, no statistically meaningful relationships were identified for sex, ethnicity, religion, household size, living arrangement, or parental educational attainment. The association between age group and nutritional status was statistically significant ($\chi^2 = 20.63$, $p = 0.008$). Distinct shifts in nutritional patterns were evident across age cohorts. Adolescents aged 10–12 years exhibited the highest rate of obesity (25.79%), whereas those aged 13–15 years recorded a lower obesity prevalence (14.36%) but a greater proportion categorized as overweight (27.66%). Among the older age group (16–18 years), a different pattern emerged, characterized by the highest rate of severe thinness (15.38%). A similarly strong and significant association was observed for class level ($\chi^2 = 43.37$, $p = 0.002$). The prevalence of obesity peaked among Primary 5 students (36.84%) but dropped notably among JHS 2 students (10.87%). Moreover, severe thinness was most frequently recorded in JHS 3 (10.00%) and JHS 1 (7.92%). The most prominent determinant of nutritional status was the household food decision-maker ($\chi^2 = 26.73$, $p = 0.008$). Adolescents who reported that food decisions were primarily made by their school exhibited the highest prevalence of obesity (44.44%) and the lowest proportion of overweight cases (16.67%). In contrast, those

who independently made food choices showed the highest rates of overweight (33.33%) and thinness (11.11%).

Table 10 Bivariate Analysis of the Association between Nutritional Status (BAZ Categories) and Sociodemographic Variables

Variables	Nutritional Status (BAZ Category)					χ² (p-Value)
	Severe Thinness	**Thinness**	**Normal**	**Overwe ight**	**Obesity**	
	N (%)	**N (%)**	**N (%)**	**N (%)**	**N (%)**	
Sex						6.1974 (0.185)
Male	9 (4.37)	5 (2.43)	90 (43.69)	52 (25.24)	50 (24.27)	
Female	9 (4.17)	10 (4.63)	112 (51.85)	49 (22.69)	36 (16.67)	
Age Group						**20.6269 (0.008)**
10-12 years	7 (3.17)	12 (5.43)	97 (43.89)	48 (21.72)	57 (25.79)	
13-15 years	9 (4.79)	3 (1.60)	97 (51.60)	52 (27.66)	27 (14.36)	
16-18 years	2 (15.38)	0 (0.00)	8 (61.54)	1 (7.69)	2 (15.38)	
Class						43.3691 **(0.002)**
Primary 4	0 (0.00)	0 (0.00)	7 (50.00)	4 (28.57)	3 (21.43)	

Primary 5	0 (0.00)	4 (4.21)	38 (40.00)	18 (18.95)	35 (36.84)
Primary 6	3 (3.33)	6 (6.67)	43 (47.78)	27 (30.00)	11 (12.22)
JHS 1	8 (7.92)	2 (1.98)	47 (46.53)	24 (23.76)	20 (19.80)
JHS 2	4 (4.35)	1 (1.09)	55 (59.78)	22 (23.91)	10 (10.87)
JHS 3	3 (10.00)	2 (6.67)	12 (40.00)	6 (20.00)	7 (23.33)
Ethnicity					12.6573 (0.698)
Akan	1 (0.96)	4 (3.85)	49 (47.12)	26 (25.00)	24 (23.08)
Ewe	5 (4.24)	4 (3.39)	59 (50.00)	30 (25.42)	20 (16.95)
Ga-Dangme	8 (5.06)	5 (3.16)	73 (46.20)	38 (24.05)	34 (21.52)
Mole-Dagbani	4 (9.76)	2 (4.88)	21 (51.22)	7 (17.07)	7 (17.07)
Other	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (100.00)
Religion					13.7413 (0.089)
Christianity	14 (3.91)	13 (3.63)	173 (48.32)	80 (22.35)	78 (21.79)
Islam	2 (4.35)	2 (4.35)	25 (54.35)	14 (30.43)	3 (6.52)

Traditional	2 (11.11)	0 (0.00)	4 (22.22)	7 (38.89)	5 (27.78)	
Who do you live with?						12.8671 (0.379)
Both parents	12 (4.67)	9 (3.50)	122 (47.47)	61 (23.74)	53 (20.62)	
One parent	3 (2.88)	4 (3.85)	51 (49.04)	26 (25.00)	20 (19.23)	
Guardian	2 (3.39)	2 (3.39)	29 (49.15)	13 (22.03)	13 (22.03)	
Other	1 (50.00)	0 (0.00)	0 (0.00)	1 (50.00)	0 (0.00)	
Household Size						12.1682 (0.144)
Small (1-3)	9 (4.89)	7 (3.80)	92 (50.00)	37 (20.11)	39 (21.20)	
Medium (4-6)	5 (3.25)	4 (2.60)	78 (50.65)	33 (21.43)	34 (22.08)	
Large (7+)	4 (4.76)	4 (4.76)	32 (38.10)	31 (36.90)	13 (15.48)	
Father's Education						14.2666 (0.817)
No formal education	0 (0.00)	0 (0.00)	2 (66.67)	1 (33.33)	0 (0.00)	
Primary	7 (5.38)	3 (2.31)	58 (44.62)	34 (26.15)	28 (21.54)	
JHS	3 (4.69)	4 (6.25)	30 (46.88)	16 (25.00)	11 (17.19)	

SHS	0 (0.00)	3 (5.00)	34 (56.67)	15 (25.00)	8 (13.33)	
Tertiary	6 (5.17)	5 (4.31)	52 (44.83)	24 (20.69)	29 (25.00)	
Other	2 (4.08)	0 (0.00)	26 (53.06)	11 (22.45)	10 (20.41)	
Mother's Education						21.6351 (0.361)
No formal education	0 (0.00)	0 (0.00)	1 (100.00)	0 (0.00)	0 (0.00)	
Primary	12 (7.10)	4 (2.37)	77 (45.56)	40 (23.67)	36 (21.30)	
JHS	1 (1.43)	3 (4.29)	41 (58.57)	15 (21.43)	10 (14.29)	
SHS	1 (1.49)	2 (2.99)	30 (44.78)	21 (31.34)	13 (19.40)	
Tertiary	1 (1.22)	6 (7.32)	38 (46.34)	18 (21.95)	19 (23.17)	
Other	3 (9.09)	0 (0.00)	15 (45.45)	7 (21.21)	8 (24.24)	
Food Decision Maker						**26.7273 (0.008)**
Myself	0 (0.00)	2 (11.11)	7 (38.89)	6 (33.33)	3 (16.67)	
Parents/Guardians	18 (4.69)	12 (3.12)	188 (48.96)	91 (23.70)	75 (19.53)	

School	0 (0.00)	0 (0.00)	7 (38.89)	3 (16.67)	8 (44.44)
Other	0 (0.00)	1 (50.00)	0 (0.00)	1 (50.00)	0 (0.00)

Note: Percentages are row percentages. Statistically significant p-values (p<0.05) are in bold.

4.8 Multivariate Analysis of Factors Associated with Dietary Habits among Adolescents

A multivariate logistic regression model was employed to determine the independent predictors of healthy dietary practices among the participants, adjusting for potential confounding variables (see Table 4.9). Age was identified as a significant demographic factor influencing dietary behavior. Adolescents aged 13–15 years demonstrated substantially lower odds of adhering to healthy eating habits (AOR = 0.40, 95% CI: 0.19–0.82, p = 0.013) when compared with their younger counterparts aged 10–12 years. Family composition and socioeconomic context also showed strong predictive power. Participants residing with a single parent were significantly less likely to maintain healthy diets (AOR = 0.43, 95% CI: 0.22–0.85, p = 0.015) compared to those living with both parents. Similarly, maternal education played a crucial role; adolescents whose mothers lacked formal education were considerably less likely to adopt healthy dietary practices (AOR = 0.14, 95% CI: 0.03–0.78, p = 0.025) relative to those whose mothers had completed Junior High School.

Regarding perceived barriers, both cost and family influence were significant deterrents to healthy eating. Adolescents who viewed food cost as a barrier exhibited a 64% lower likelihood of practicing healthy eating (AOR = 0.36, 95% CI: 0.16–0.79, p = 0.011). Likewise, those who identified family preferences as a barrier were 56% less likely to follow a healthy diet (AOR =

0.44, 95% CI: 0.25–0.78, p = 0.004). On the other hand, behavioral variables demonstrated some positive associations. Although not statistically significant in the adjusted model, regular physical activity indicated a positive trend toward healthier eating (AOR = 2.73, 95% CI: 1.00–7.46, p = 0.051). Interestingly, extended television viewing of 5–6 hours per day emerged as a strong positive predictor (AOR = 4.69, 95% CI: 1.97–11.16, p < 0.001), suggesting a complex relationship between sedentary behavior and dietary outcomes in this population.

Table 11 Multivariate Analysis of Factors Associated with Dietary Habits among Adolescents

Variables	COR	(95% CI)	p-value	AOR	(95% CI)	p-value
Sex						
Male	Ref	-	-	Ref	-	-
Female	0.95	0.64 – 1.39	0.787	1.09	0.65 – 1.84	0.742
Age Group						
10-12 years	Ref	-	-	Ref	-	-
13-15 years	0.74	0.50 – 1.10	0.141	0.40*	0.19 – 0.82	0.013*
16-18 years	0.18*	0.05 – 0.69	0.012*	0.22	0.04 – 1.32	0.098
Class						
Primary 4	Ref	-	-	Ref	-	-
JHS 2	0.85	0.48 – 1.51	0.577	1.64	0.73 – 3.68	0.233
JHS 3	6.15*	1.75 – 21.62	0.005*	4.24	0.90 – 20.00	0.068
Primary 5	0.73	0.41 – 1.28	0.271	0.47	0.20 – 1.07	0.070
Primary 6	0.85	0.48 – 1.52	0.591	0.72	0.32 – 1.60	0.413
Ethnicity						

Akan	Ref	-	-	Ref	-	-
Ewe	1.62	0.95 – 2.77	0.076	1.27	0.63 – 2.54	0.507
Ga-Dangme	1.55	0.94 – 2.55	0.086	1.33	0.66 – 2.68	0.432
Mole-Dagbani	1.05	0.51 – 2.16	0.895	0.27*	0.08 – 0.92	0.037*
Other	(omitted)	-	-	(empty)	-	-
Religion						
Christianity	Ref	-	-	Ref	-	-
Islam	1.83	0.94 – 3.54	0.074	2.96	0.90 – 9.69	0.073
Traditional	1.60	0.59 – 4.35	0.359	0.92	0.27 – 3.12	0.897
Who do you live with?						
Both parents	Ref	-	-	Ref	-	-
Guardian	0.36*	0.20 – 0.65	0.001*	0.59	0.27 – 1.29	0.182
One parent	0.30*	0.19 – 0.48	0.000*	0.43*	0.22 – 0.85	0.015*
Other	(omitted)	-	-	(empty)	-	-
Household Size						
Small (1–3)	Ref	-	-	Ref	-	-
Medium (4–6)	2.50*	1.59 – 3.93	0.000*	0.89	0.40 – 1.98	0.780
Large (7+)	0.95	0.57 – 1.60	0.857	0.59	0.26 – 1.33	0.200
Father's Education						
Junior High School	Ref	-	-	Ref	-	-
No formal education	2.27	0.20 – 26.27	0.513	1.76	0.00 – 12104	0.900
Primary	2.50	0.17 – 23.25	0.580	0.55	0.00 – 3813	0.894

Senior High School	3.04	0.27 – 34.54	0.369	0.58	0.00 – 3971	0.903
Tertiary	5.00	0.42 – 59.66	0.203	0.49	0.00 – 3337	0.873
Mother's Education						
Junior High School	Ref	-	-	Ref	-	-
No formal education	0.17*	0.06 – 0.45	0.000*	0.14*	0.03 – 0.78	0.025*
Primary	0.23*	0.08 – 0.63	0.004*	0.35	0.07 – 1.71	0.194
Senior High School	0.48	0.18 – 1.30	0.148	0.89	0.20 – 4.01	0.876
Tertiary	(omitted)	-	-	(omitted)	-	-
Who decides food?						
Parents/Guardians	3.80*	1.33 – 10.87	0.013*	3.08	0.83 – 11.51	0.094
School	3.25	0.81 – 13.03	0.096	2.01	0.37 – 10.89	0.416
Other	(empty)	-	-	(empty)	-	-
Regular exercise						
No	Ref	-	-	Ref	-	-
Yes	3.48*	1.57 – 7.71	0.002*	2.73	1.00 – 7.46	0.051
Hours watching TV/day						
3-4 hours	1.92*	1.17 – 3.16	0.010*	1.41	0.76 – 2.62	0.277
5-6 hours	9.57*	4.66 – 19.68	0.000*	4.69*	1.97 – 11.16	0.000*
Less than 1 hour	Ref	-	-	Ref	-	-

More than 6 hours	25.70*	3.30 – 200.27	0.002*	(empty)	-	-
Cultural/religious beliefs						
No	0.47	0.05 – 4.23	0.497	0.62	0.05 – 8.50	0.720
Yes	0.19	0.02 – 1.71	0.138	0.61	0.04 – 8.49	0.716
Nearest market						
Less than 10 min	Ref	-	-	Ref	-	-
10-30 minutes	0.95	0.57 – 1.57	0.832	1.79	0.86 – 3.74	0.120
More than 30 min	(omitted)	-	-	(omitted)	-	-
Barrier: Cost	0.30*	0.17 – 0.50	0.000*	0.36*	0.16 – 0.79	0.011*
Barrier: Availability	1.14	0.76 – 1.71	0.518	1.84	0.92 – 3.70	0.085
Barrier: Taste	0.71	0.48 – 1.05	0.086	0.71	0.40 – 1.25	0.240
Barrier: Family	0.39*	0.26 – 0.58	0.000*	0.44*	0.25 – 0.78	0.004*
Barrier: Knowledge	0.67	0.41 – 1.09	0.108	1.06	0.53 – 2.13	0.860
Barrier: Time	0.48*	0.28 – 0.82	0.007*	0.53	0.26 – 1.09	0.083
Barrier: Nothing	1.53	0.92 – 2.56	0.102	0.87	0.42 – 1.82	0.719

*Note: * indicates statistical significance (p < 0.05). COR = Crude Odds Ratio; AOR = Adjusted Odds Ratio; CI = Confidence Interval. Reference categories are as specified in the methodology. Some categories were omitted due to perfect prediction or collinearity.*

4.9 Multivariate Analysis of Factors Associated with Nutritional Status Among Adolescents

A multivariate ordinal logistic regression analysis was performed to determine the independent predictors of nutritional status among the adolescents, controlling for all variables included in the model (see Table 4.10). The results indicated that only two variables emerged as statistically

significant at the 5% level. The student's class level was identified as the most influential predictor of nutritional status. Participants enrolled in Primary 5 had 2.58 times higher odds of being in a more favorable nutritional category compared to those in Primary 4, which served as the reference group (AOR = 2.58; 95% CI: 1.37–4.86; p = 0.003). The second significant variable was the self-perceived healthiness of the participant's diet. Interestingly, contrary to expectations, adolescents who described their diets as *unhealthy* were 1.63 times more likely to fall within a better nutritional category compared to those who considered their diets *healthy* (AOR = 1.63; 95% CI: 1.03–2.57; p = 0.036). None of the other examined socio-demographic or contextual factors including age, sex, ethnicity, religion, household structure, parental educational level, or reported barriers such as food cost, availability, and nutritional knowledge showed a statistically significant independent relationship with nutritional status in the fully adjusted model

Table 12 Multivariate Analysis of Factors Associated with Nutritional Status Among Adolescents

Variables	COR	(95% CI)	p-value	AOR	(95% CI)	p-value
Age groups (in years)						
10 – 12	Ref	-	-	Ref	-	-
13 – 15	0.76	0.53 – 1.09	0.133	1.17	0.67 – 2.04	0.573
16 – 18	0.36	0.12 – 1.09	0.072	0.69	0.16 – 2.89	0.607
Sex						
Male	Ref	-	-	Ref	-	-
Female	0.67	0.47 – 0.95	0.026	0.72	0.49 – 1.07	0.100
Class						
Primary 4	Ref	-	-	Ref	-	-

JHS 1	(omitted)	-	-	(omitted)	-	-
JHS 2	0.78	0.46 – 1.32	0.350	0.77	0.42 – 1.42	0.402
JHS 3	0.91	0.41 – 2.03	0.815	0.91	0.36 – 2.35	0.851
Primary 5	2.06	1.21 – 3.50	0.008	2.58	1.37 – 4.86	0.003*
Primary 6	0.88	0.52 – 1.49	0.629	0.85	0.47 – 1.54	0.602
Ethnicity						
Akan	Ref	-	-	Ref	-	-
Ewe	0.75	0.46 – 1.22	0.243	0.71	0.42 – 1.20	0.199
Ga-Dangme	0.86	0.54 – 1.35	0.512	0.76	0.46 – 1.28	0.307
Mole-Dagbani	0.51	0.25 – 1.03	0.059	0.61	0.25 – 1.46	0.264
Other	-	-	-	-	-	-
Religion						
Christianity	Ref	-	-	Ref	-	-
Islam	0.66	0.38 – 1.16	0.153	0.76	0.37 – 1.56	0.453
Traditional	1.75	0.74 – 4.16	0.202	2.19	0.84 – 5.75	0.110
Who do you live with?						
Both parents	Ref	-	-	Ref	-	-
Guardian	1.04	0.62 – 1.77	0.874	1.39	0.75 – 2.56	0.294
One parent	1.01	0.66 – 1.53	0.978	1.21	0.72 – 2.04	0.467

Other	0.20	0.01 – 6.66	0.366	0.51	0.01 – 39.43	0.763
Household Size						
Small (1–3)	Ref	-	-	Ref	-	-
Medium (4–6)	1.13	0.76 – 1.69	0.539	0.91	0.51 – 1.63	0.754
Large (7+)	1.19	0.74 – 1.90	0.480	1.28	0.70 – 2.33	0.421
Father's Education						
Junior High School	Ref	-	-	Ref	-	-
No formal education	1.23	0.17 – 9.13	0.840	0.93	0.08 – 10.56	0.955
Primary	1.20	0.16 – 8.92	0.858	0.84	0.07 – 9.84	0.891
Senior High School	1.56	0.21 – 11.31	0.661	1.33	0.12 – 15.15	0.820
Tertiary	1.49	0.20 – 11.20	0.700	1.69	0.15 – 19.39	0.673
Mother's Education						
Junior High School	Ref	-	-	Ref	-	-
No formal education	2.39	0.08 – 76.13	0.621	1.33	0.02 – 105.27	0.897
Primary	3.76	0.12 – 119.74	0.454	2.37	0.03 – 192.84	0.701
Senior High School	3.27	0.10 – 103.85	0.502	1.24	0.02 – 100.82	0.925
Tertiary	3.25	0.10 – 107.30	0.508	0.91	0.01 – 73.00	0.966
Who decides food?						
Parents/Guardians	Ref	-	-	Ref	-	-

Other	0.34	0.02 – 6.20	0.467	0.40	0.02 – 7.71	0.545
School	2.56	0.76 – 8.64	0.130	1.29	0.35 – 4.80	0.706
Barrier: Cost	0.82	0.51 – 1.32	0.416	0.77	0.42 – 1.40	0.386
Barrier: Availability	1.01	0.70 – 1.46	0.956	0.96	0.58 – 1.58	0.860
Barrier: Taste	0.87	0.61 – 1.25	0.464	0.77	0.50 – 1.18	0.225
Barrier: Family	0.87	0.60 – 1.25	0.444	0.93	0.60 – 1.44	0.733
Barrier: Knowledge	0.91	0.57 – 1.44	0.674	0.93	0.54 – 1.60	0.790
Barrier: Time	0.98	0.60 – 1.60	0.931	0.89	0.51 – 1.56	0.681
Barrier: Nothing	0.98	0.62 – 1.56	0.934	0.78	0.44 – 1.38	0.393
Regular Exercise	0.77	0.42 – 1.40	0.390	0.64	0.33 – 1.23	0.180
Hours watching TV/day						
Less than 1 hour	Ref	-	-	Ref	-	-
3-4 hours	1.09	0.69 – 1.73	0.702	0.97	0.59 – 1.62	0.915
5-6 hours	1.14	0.68 – 1.90	0.619	0.83	0.44 – 1.57	0.562
More than 6 hours	1.04	0.40 – 2.71	0.943	0.98	0.32 – 3.04	0.977
Cultural/Religious Restrictions						

	COR	95% CI	p-value	AOR	95% CI	p-value
No	0.48	0.09 – 2.49	0.383	1.15	0.16 – 8.10	0.886
Yes	0.33	0.06 – 1.74	0.191	0.69	0.09 – 5.01	0.712
Nearest Market						
Less than 10 minutes	Ref	-	-	Ref	-	-
10-30 minutes	-	-	-	-	-	-
More than 30 minutes	-	-	-	-	-	-
Healthiness of Diet						
Healthy Diet	Ref	-	-	Ref	-	-
Unhealthy Diet	1.51	1.05 – 2.17	0.025*	1.63	1.03 – 2.57	0.036*

Note: p-value < 0.05; COR = Crude Odds Ratio; AOR = Adjusted Odds Ratio; CI = Confidence Interval; Ref = Reference category; JHS = Junior High School; Data for some categories were omitted from the final model output due to perfect prediction or collinearity or questionable standard errors.

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

This chapter discusses the findings of the study on dietary habits, nutritional status, and related factors among adolescents at selected basic schools in the Ashaiman Municipality. The findings are interpreted and discussed around the study's specific objectives and incorporates comparisons situated within existing literature.

5.2 Socio-demographic Characteristics of Adolescents

The socio-demographic characteristics of the study participants showed considerable diversity in terms of age, gender, household composition, and parental education, each exerting measurable influence on dietary behaviors and nutritional outcomes.

Age-related differences were particularly evident, with younger adolescents (10–12 years) exhibiting a higher prevalence of obesity compared to their older counterparts (13–15 years). This observation supports the findings of Das et al. (2017), who argued that excessive caloric intake and poor dietary regulation often emerge in early childhood, resulting in early-onset obesity. However, it diverges from Candler et al. (2017), whose research indicated that severe thinness was more common during the earlier stages of adolescence in low- and middle-income settings.

Gender-based variations were also apparent. Male participants displayed a greater tendency toward being overweight or obese than females, aligning with global evidence indicating higher obesity rates among boys aged 5–19 years (Shah et al., 2020). In contrast, Navti et al. (2014) found that female adolescents in Cameroon had higher rates of overweight and obesity. Such discrepancies

may stem from differences in cultural norms, dietary access, and levels of physical activity across populations.

Maternal education emerged as a key determinant of dietary quality. Adolescents whose mothers lacked formal education were significantly less likely to practice healthy eating compared to those whose mothers had attained at least junior high education. This pattern corresponds with evidence from sub-Saharan Africa, where maternal education has been identified as a major predictor of child and adolescent nutritional well-being (Makoka & Masibo, 2015). A similar relationship was confirmed in Ethiopia, where Hadush et al. (2021) observed improved nutritional outcomes among adolescents with educated mothers.

Family structure was another influential factor. Adolescents raised by single parents demonstrated poorer dietary patterns compared with those living in two-parent households. This finding corroborates the results of Fismen et al. (2022), who linked single-parent families with lower consumption of fruits and vegetables and higher intake of sugary beverages. Likewise, research in Brazil found that adolescents from single-parent homes were less likely to adhere to healthy dietary practices (De Souza et al., 2023). These observations underscore the crucial role of household composition, parental monitoring, and support in shaping adolescent eating behaviors and overall nutritional outcomes.

5.3 Dietary Practices of Adolescents

The analysis showed that a majority of adolescents (71.1%) reported eating three meals daily, which corresponds with standard dietary recommendations for school-aged populations. Similar results were observed by Islam et al. (2024), who noted comparable eating frequencies among

adolescents in Bangladesh. However, despite this overall meal regularity, unhealthy behaviors such as skipping meals were still commonly practiced.

Breakfast skipping was especially prevalent, affecting 41.9% of respondents, followed closely by lunch skipping (41.2%), while supper was least likely to be skipped (16.8%). These findings echo the observations of Abdulai et al. (2020), who documented widespread breakfast skipping among adolescents in Tamale. Likewise, Olatona et al. (2023) identified similar patterns in Lagos, Nigeria, where breakfast and lunch were most frequently omitted even though multiple meals were consumed daily. However, differences in magnitude exist while this study reported 41.9% skipping breakfast, Abdulai et al. (2020) found 87.8%, suggesting regional variations within Ghana. The main reasons cited for skipping meals included saving money (40.0%) and lack of hunger (38.6%), followed by lack of food availability (29.4%), insufficient time (29.4%), food dislike (20.1%), and weight reduction efforts (15.2%). These reasons mirror those identified by Abdulai et al. (2020) as key determinants of adolescent dietary behavior.

Breakfast consumption was generally low, only 44.6% ate breakfast daily, while 23.9% consumed it merely two to three times per week. This aligns with Hormenu (2022), who reported that 57% of Ghanaian adolescents regularly skipped breakfast. Collectively, these studies emphasize that breakfast skipping remains a widespread public health issue in Ghana, despite its recognized importance for concentration, learning, and metabolic balance.

Breakfast choices were predominantly carbohydrate-based, including porridge (63.5%), bread with tea (41.7%), rice or waakye (39.1%), and fried foods (38.6%), with only 4.7% reporting fruit consumption. This pattern corresponds with Islam et al. (2024), who also found frequent consumption of cereals and processed foods among Bangladeshi adolescents. Both studies

highlight inadequate intake of nutrient-rich foods such as fruits, vegetables, and dairy, raising concerns about possible micronutrient deficiencies.

Snacking was widely practiced (42.9%), but choices were mainly energy-dense and nutrient-poor, including biscuits (27.3%), fried snacks (19.2%), and soft drinks (16.8%). Only 8.1% consumed fruits as snacks. Similar behaviors were documented by Olatona et al. (2023), who found that 82% of Nigerian adolescents snacked frequently on sugary or fried foods, and by Abdulai et al. (2020), who attributed such habits to personal preferences and appetite. This consistent evidence from various African settings indicates that adolescent snacking often involves high-calorie, low-nutrient foods.

Eating outside the home was also widespread, with 74.2% of participants consuming food purchased externally during weekdays. Popular items included banku (23.9%), kenkey (22.7%), and fried yam (19.2%), demonstrating a heavy dependence on starchy staples and limited dietary diversity. This aligns with Galbete et al. (2017), who reported that Ghanaian diets are primarily grain-based, and with Wiafe et al. (2023), who observed similar consumption patterns—high intake of cereals and tubers but low intake of dairy, eggs, and legumes among rural adolescents.

Fruit and vegetable consumption remained suboptimal: only 21.8% and 22.8% of participants consumed fruits and vegetables daily, respectively, while 36.7% consumed them four to five times weekly. These levels fall below recommended dietary guidelines. Comparable trends were seen in Nigeria, where just 35% of adolescents consumed fruits and vegetables regularly, and fewer than 10% met the daily requirement (Olatona et al., 2023).

Rice (31.0%) and fish/meat (26.8%) were the most frequently consumed foods, nearly on a daily basis. This corresponds with findings from Lestari et al. (2018), who also documented high rice and animal-protein consumption among Indonesian adolescents, indicating a regional preference for starchy staples and protein-based meals.

Consumption of sugar-sweetened beverages was remarkably high: 18.5% drank them daily and 70.6% several times weekly, with only 10.9% reporting minimal intake. These findings are consistent with Hu et al. (2023), who identified a strong correlation between sugary drink intake and adolescent obesity across 107 countries. Similarly, Hormenu (2022) found that 93% of Ghanaian adolescents regularly consumed soft drinks, emphasizing the widespread popularity of sugary beverages among youth.

Water consumption varied, with 38.9% drinking 3–4 glasses daily, 22.0% consuming 7–8 glasses, 15.6% exceeding 8 glasses, and 4.7% drinking only 1–2 glasses. These patterns mirror those observed by Doegah and Amoateng (2018), who reported insufficient water intake among Ghanaian adolescents, particularly among females. This highlights the need for increased awareness about proper hydration.

5.4 Nutritional Status of Adolescents

Nutritional assessments revealed a dual challenge of under nutrition and overweight among participants. Nearly half (47.9%) had normal nutritional status, but 44.3% were classified as overweight (23.9%) or obese (20.4%), while 7.8% were undernourished, including 4.3% severely thin and 3.6% thin. This reflects Ghana's "double burden of malnutrition," where under nutrition and obesity coexist (Kushitor et al., 2021). Similar trends were reported in Tamale, where Abdulai

et al. (2020) found underweight prevalence at 26.1% and overweight/obesity at only 5.9%, suggesting urban adolescents may face greater dietary excesses compared to rural counterparts.

Age-related variations were also apparent. Obesity prevalence was 25.8% among 10–12-year-olds compared to 14.4% among 13–15-year-olds, suggesting that younger adolescents may experience early exposure to calorie-dense diets (Das et al., 2017). Conversely, severe thinness was most common among 16–18-year-olds (15.4%), compared to only 3.2% among younger participants, contrary to Candler et al. (2017), who found severe thinness more prevalent in early adolescence. These trends may indicate increased energy expenditure or dietary restriction among older adolescents.

Gender differences were also notable. Boys were more likely to be overweight (25.2%) and obese (24.3%) than girls (22.7% and 16.7%, respectively), while girls had higher rates of thinness (4.6% vs. 2.4%). These findings differ from Navti et al. (2014), who found higher obesity rates among girls in Cameroon, but are consistent with global estimates indicating higher obesity prevalence among boys aged 5–19 years (Shah et al., 2020). Such variations underscore the influence of cultural, behavioral, and socioeconomic factors on adolescent nutrition.

Overall, 57.6% of participants reported following healthy diets, while 42.4% had unhealthy dietary patterns. This aligns with Samuel et al. (2021), who identified both healthy and unhealthy dietary profiles among African adolescents, though with differing proportions (33.9% healthy vs. 66.1% unhealthy). These findings underscore the coexistence of both positive and negative eating behaviors across sub-Saharan adolescent populations.

5.5 Factors Associated with Dietary Habits and Nutritional Outcomes

The multivariate analysis identified several independent factors influencing adolescents' dietary practices and nutritional outcomes. Age emerged as a significant determinant, with adolescents aged 13–15 years demonstrating significantly lower odds of adhering to healthy dietary behaviors compared to those aged 10–12 years (AOR = 0.40, 95% CI: 0.19–0.82). This finding supports the conclusions of Fismen et al. (2022), who observed that increasing age among adolescents correlated with poorer dietary patterns, specifically reduced intake of fruits and vegetables and increased consumption of sweets and sugar-sweetened beverages.

Family structure also played a crucial role. Adolescents living with a single parent exhibited significantly lower odds of maintaining healthy dietary habits (AOR = 0.43, 95% CI: 0.22–0.85) compared to those living with both parents. Fismen et al. (2022) reported similar trends, noting that adolescents in single-mother households consumed fewer vegetables (OR = 0.76, 95% CI: 0.63–0.91), more soft drinks (OR = 1.29, 95% CI: 1.06–1.57), and fewer fruits (OR = 0.71, 95% CI: 0.54–0.95) than those from two-parent homes. Likewise, de Souza et al. (2023) found that single-parent adolescents in Brazil were more likely to follow unhealthy dietary patterns. Collectively, these findings underscore the influence of parental presence and supervision on adolescents' nutritional behaviors.

Maternal education was another strong predictor. Adolescents whose mothers had no formal education were substantially less likely to maintain a healthy diet compared to those whose mothers had at least junior high education (AOR = 0.14, 95% CI: 0.03–0.78). This supports prior

research by Makoka and Masibo (2015), which identified maternal education as one of the most powerful determinants of child and adolescent nutritional outcomes in sub-Saharan Africa.

Perceived barriers to healthy eating also demonstrated significant associations. Adolescents who cited cost as a major constraint had 64% lower odds of maintaining a healthy diet (AOR = 0.36, 95% CI: 0.16–0.79), while those identifying family food choices as a barrier had 56% lower odds (AOR = 0.44, 95% CI: 0.25–0.78). These results are consistent with Bai et al. (2021), who found that economic limitations frequently restrict access to nutrient-rich foods, making affordability a major obstacle for low-income households. Similarly, Liu et al. (2021) highlighted the role of family influence, mealtime routines, and parental food choices in shaping adolescent dietary behaviors. When families deprioritize healthy foods or lack knowledge of proper meal preparation, adolescents are often unable to sustain healthy eating patterns.

Lifestyle factors were also significant. Regular physical activity showed a positive, though borderline, relationship with healthy dietary habits (AOR = 2.73, 95% CI: 1.00–7.46). This is consistent with Sandri et al. (2025), who observed that adolescents who engaged more frequently in physical activity tended to consume more fruits, vegetables, legumes, and fish are key components of a balanced diet. Interestingly, watching television for 5–6 hours daily was associated with higher odds of healthy eating (AOR = 4.69, 95% CI: 1.97–11.16). This result contradicts the findings of Avery, Anderson, and McCullough (2017), who demonstrated that eating while watching television was linked to poorer dietary quality, including greater intake of sugary and fatty foods and lower consumption of fruits and vegetables. The discrepancy may reflect contextual differences in leisure behavior or variations in dietary reporting among adolescents.

Regarding nutritional status, educational level appeared to be an independent predictor. Students in Primary 5 had significantly higher odds of being in a more favorable nutritional category compared to those in Primary 4 (AOR = 2.58, 95% CI: 1.37–4.86). This finding suggests that exposure to higher academic levels and possibly greater nutrition-related awareness may contribute to improved dietary choices and health outcomes. Consistent with this, Sandri et al. (2024) reported that individuals with higher levels of education generally adopt healthier lifestyles and demonstrate better nutritional profiles, reinforcing the interdependence between education and nutrition.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

The study assessed the dietary habits, nutritional status, and related factors among adolescents at selected basic schools in the Ashaiman Municipality of the Greater Accra Region, Ghana. The study provided valuable insights into the eating patterns, nutritional outcomes, and determinants shaping adolescent health in this setting.

6.2 Conclusion

The findings revealed that although most respondents consumed three meals a day, meal skipping was prevalent, particularly for breakfast and lunch, with saving money and lack of appetite being major reasons. Snacking practices leaned heavily toward biscuits, fried foods, and carbonated drinks, while the intake of fruits and vegetables remained inadequate. Traditional staples such as banku, kenkey, and rice dominated outside food purchases, with very limited preference for healthier alternatives such as fruits.

In terms of nutritional status, less than half of the adolescents were within the normal weight range, while a significant proportion were either overweight or obese. Undernutrition was also present, albeit at lower levels, indicating that adolescents in Ashaiman face a double burden of malnutrition. Males were more likely to be overweight or obese, while females had higher rates of thinness.

Several household and lifestyle-related factors influenced dietary habits and nutritional outcomes. Parental and guardian decision-making played a critical role in determining food choices, with maternal education significantly associated with healthier diets. Barriers such as cost, family food preferences, and time constraints were major obstacles to adopting healthy eating habits.

Additionally, lifestyle factors such as physical activity, adequate sleep, and moderate screen time were significantly associated with healthier diets, whereas food insecurity and resource constraints worsened nutritional outcomes.

Overall, while adolescents in Ashaiman demonstrated structured meal routines, their diets were characterized by limited diversity, frequent consumption of unhealthy snacks, and inadequate intake of fruits and vegetables. The study highlights an urgent need for interventions that address individual behavior, household practices, and broader environment and institutional determinants of adolescent nutrition.

6.3 Recommendations

Based on the findings of the study, the following recommendations are proposed:

1. **Promote Further Research on Determinants and Barrier to Healthy Eating Among Adolescents:** Further qualitative research is strongly recommended to provide deeper, contextual insights into the specific determinants and barriers that influence dietary habits such as the observed high rates of meal skipping and poor fruit and vegetable intake among adolescents in the Ashaiman Municipality. Employing qualitative approaches, such as focus group discussions or in-depth interviews, would help explore contextual factors including cultural norms, household food practices, peer influence, and crucially, the specific financial constraints and time pressures identified by adolescents that contribute to unhealthy dietary choices and meal skipping. Insights generated from such studies will provide valuable evidence to inform the design of targeted, context-specific interventions aimed at promoting healthy dietary practices and improving adolescent nutritional status in the municipality, particularly addressing the perceived cost and convenience barriers.

2. **Enhance Household and Parental Involvement in Nutrition Education (Public Health Practice & Education Focus):**

To effectively improve adolescent nutritional status, especially given the study's indication of limited parental awareness regarding adolescent dietary needs and the challenges adolescents face at home, it is crucial to actively engage households and parents as key partners in nutrition promotion. The Municipal Health Directorate, in collaboration with School Health Coordinators, Parent-Teacher Associations, and relevant Non-Governmental Organizations, should lead initiatives that create accessible platforms for regular communication and education. These should be specifically aimed at raising parental awareness about healthy eating habits, cost-effective meal planning, practical strategies for incorporating more fruits and vegetables into family diets, portion control, and the importance of balanced diets for adolescents. Encouraging parents to model healthy behaviors and support their adolescent's participation in physical activities can reinforce positive lifestyle changes, thereby creating a consistent home environment that supports adolescents' nutritional well-being and helps mitigate issues like meal skipping due to lack of appealing home-cooked options.

3. **Implement Routine Nutritional Monitoring and Targeted Intervention Pathways (Public Health Practice & Policy Focus):**

The Municipal Health Directorate, in collaboration with school health personnel and community nurses, should implement a routine schedule for nutritional assessments within schools to identify early signs of overweight, obesity, or thinness among adolescents. These screenings are vital for timely detection of at-risk individuals, especially considering the study's observation of a significant proportion of adolescents falling into both overweight and underweight categories. Adolescents flagged through this process would be immediately referred to school health personnel or linked with nearby community health facilities for further

evaluation, counseling tailored to address specific dietary deficiencies or excesses identified in this study, and appropriate nutritional or medical management. Establishing clear policy guidelines for these referrals and subsequent follow-up care is essential to ensure a robust public health response to identified nutritional disparities.

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APPENDIX I: CONSENT FORM

(For parents/guardians of adolescents participating in the study)

Title of Study: Dietary Habits, Nutritional Status, and Related Factors Among Adolescents at Selected Basic Schools in the Ashaiman Municipality of the Greater Accra Region, Ghana

Introduction:

You are invited to allow your child to participate in a research study conducted by Esther Ewurabena Naadu Apeanyo from Ensign Global University. The purpose of this study is to assess the dietary habits, nutritional status, and related factors among adolescents at selected basic schools in the Ashaiman Municipality of the Greater Accra Region, Ghana. Participation is entirely voluntary, and you or your child may withdraw at any time without any negative consequences.

Purpose of the Study:

The study aims to:

1. To describe the dietary habits of adolescents at selected basic schools in the Ashaiman Municipality.

2. To determine the nutritional status of adolescents at selected basic schools in the Ashaiman Municipality using anthropometric indicators.

3. To identify factors associated with dietary habits and nutritional status among adolescents at selected basic schools in the Ashaiman Municipality.

Procedures:

If you consent to your child's participation, they will be asked to respond to a structured questionnaire and undergo basic anthropometric measurements (such as height and weight) administered by the

researcher or trained assistants. The questionnaire will focus on their eating habits, lifestyle, and other related factors. The entire process will take approximately 30–40 minutes and will take place in a safe, private environment within the school premises.

Potential Risks and Discomforts:

There are no anticipated physical or psychological risks to your child. If any part of the process causes discomfort, your child may choose to skip questions or withdraw from the study without any penalty.

Potential Benefits:

Your child may not receive any direct benefit from participating. However, the study findings may help improve nutrition-related education, programs, and interventions for adolescents in the municipality and beyond.

Confidentiality:

All information collected will be kept strictly confidential. No names or identifying details will be recorded or shared. Data will be stored securely and used solely for academic and research purposes. Results will be presented in a way that ensures participants' anonymity.

Voluntary Participation and Withdrawal:

Your child's participation is entirely voluntary. You may choose not to allow them to participate, or you may withdraw your consent at any time, without facing any negative consequences.

Compensation:

There is no financial compensation for participation. However, your child's involvement is deeply appreciated and will contribute to important academic and public health insights.

Questions and Contacts:

If you have any questions about the study or your rights as a participant, please contact:

Principal Researcher:

Esther Ewurabena Naadu Apeanyo

Ensign Global University, Kpong

Eastern Region, Ghana

esther.apeanyo@st.ensign.edu.gh

+233(0)558299868

This research has been reviewed and approved by the Institutional Review Board (IRB) of Ensign Global University, Kpong. For inquiries about your rights as a participant, you may contact the IRB office at **0245762229** or **registrar@ensign.edu.gh** during working hours (8:00 am–5:00 pm).

Statement of Consent:

I have read and understood the above information and have had the opportunity to ask questions. I voluntarily give permission for my child to participate in this study.

Name of Parent/Guardian: _____   Date: _____

Signature of Parent/Guardian: _____

Name of Child (Participant): _____

Researcher's Signature: _____   Date: _____

APPENDIX II: ASSENT FORM

Title of Study: Dietary Habits, Nutritional Status, and Related Factors Among Adolescents at Selected Basic Schools in the Ashaiman Municipality of the Greater Accra Region, Ghana

Introduction:

Hello,

My name is **Esther Ewurabena Naadu Apeanyo**, a student at **Ensign Global University**. I am doing a research project to understand how young people in Ashaiman eat (their dietary habits), their health in terms of nutrition, and the things that influence these behaviors. You are being asked to take part in this study because you are a student in one of the selected schools in the Ashaiman Municipality.

Before you decide, please read or listen carefully to this form. You can ask questions at any time if something is not clear.

What Will Happen if You Join the Study:

If you agree to take part in this study, you will be asked to answer a questionnaire. The questions will be about the kinds of foods you eat, how often you eat them, your health, and some other related things. It will take about 20 to 30 minutes to complete.

There are no right or wrong answers, just be honest and share what is true for you.

Do You Have to Be in the Study?

No, you do not have to be in the study. It's your choice. Even if you agree now, you can stop at any time and no one will be upset with you.

Will the Questions Be Difficult or Upsetting?

Most questions are simple and easy to answer. But if you feel uncomfortable with any question, you can skip it or stop the questionnaire altogether. You can also talk to your teacher or the school counselor if you feel uneasy.

Will Anyone Know What You Say?

Everything you say will be **kept private**. Your name will **not** be written on the questionnaire. No one— not even your parents, teachers, or classmates will know what you answered. Only the researcher will see the responses, and only for this study.

What Are the Good Things About Being in the Study?

There may not be a direct benefit to you, but your answers will help researchers and adults understand how to improve the eating habits and health of students like you.

Questions?

If you have questions now or later, you can talk to me (the researcher), your teacher, or your parent/guardian.

Assent Statement (to be completed by participant):

I understand what the study is about and what I will be asked to do. I know I can choose not to take part or stop at any time. I have had a chance to ask questions and they have been answered.

I agree to take part in this study.

Name of Participant (in block letters): _____

Signature/Thumbprint: _____   Date: _____

APPENDIX III: SURVEY QUESTIONNAIRE

Title: Dietary Habits, Nutritional Status, and Related Factors Among Adolescents at Selected Basic Schools in the Ashaiman Municipality of the Greater Accra Region, Ghana

Participant ID: _____   **Date:** _____

Section A: Socio-Demographic and Household Information
1. **Age:** _____ years
2. **Sex:**
     o ☐ Male
     o ☐ Female
3. **Name of School** _____
4. **Class:**
     o ☐ Primary 4
     o ☐ Primary 5
     o ☐ Primary 6
     o ☐ JHS 1
     o ☐ JHS 2
     o ☐ JHS 3
5. **Ethnicity:**
     o ☐ Akan
     o ☐ Ewe
     o ☐ Ga-Dangme
     o ☐ Mole-Dagbani
     o ☐ Other: _____
6. **Religion:**
     o ☐ Christianity
     o ☐ Islam
     o ☐ Traditional

o　☐ Other: _____

7. Who do you live with?

    o　☐ Both parents

    o　☐ One Parent

    o　☐ Guardian

    o　☐ Other (specify): _____

8. Household size (number of people living together): _____

9. What is your parent/guardian's highest level of education?

    o　☐ No formal education

    o　☐ Primary

    o　☐ Junior High

    o　☐ Senior High

    o　☐ Tertiary

Section B: Dietary Habits

10. How many meals do you eat in a typical day?

    o　☐ 1

    o　☐ 2

    o　☐ 3

    o　☐ More than 3

11. Which meal do you skip most often?

    o　☐ Breakfast

    o　☐ Lunch

    o　☐ Supper

12. Why do you skip meals? (Check all that apply):

    o　☐ No food available

    o　☐ Not hungry

    o　☐ To save money

    o　☐ Want to lose weight

- o ☐ Dislike food

- o ☐ No time

- o ☐ Other: _____

13. **How often do you eat the following meals in a week?**

Meal	0–1 day	2–3 days	4–5 days	6–7 days
Breakfast	☐	☐	☐	☐
Lunch	☐	☐	☐	☐
Supper	☐	☐	☐	☐

14. **What do you usually eat for breakfast? (Check all that apply):**

- o ☐ Bread/tea

- o ☐ Porridge (e.g., koko, hausa koko)

- o ☐ Rice/waakye

- o ☐ Fruits

- o ☐ Fried foods (e.g., koose, bofrot)

- o ☐ Others (specify): _____

15. **Do you snack between meals?**

- o ☐ Yes

- o ☐ No

16. **What types of snacks do you eat most often? (Check all that apply):**

- o ☐ Fruits

- o ☐ Biscuits/Cookies

- o ☐ Toffees/Candy

- o ☐ Carbonated drinks

- o ☐ Vegetables

- o ☐ Fried foods

- o ☐ Others: _____

17. **How often do you eat food outside your home?**

- o ☐ Every day

- o ☐ Once a week
- o ☐ Weekdays only
- o ☐ Weekends only
- o ☐ Never

18. **Which meals do you mostly buy outside the home?**

- o ☐ Breakfast
- o ☐ Lunch
- o ☐ Supper

19. **What foods do you usually buy outside? (Check all that apply):**

- o ☐ Rice
- o ☐ Kenkey
- o ☐ Banku
- o ☐ Fried yam
- o ☐ Indomie
- o ☐ Fruits
- o ☐ Drinks
- o ☐ Others: _____

20. **In the past week, how many days did you eat the following foods?**

Food Item	0 days	1–2 days	3–4 days	5–6 days	7 days
Rice	☐	☐	☐	☐	☐
Bread/Biscuits	☐	☐	☐	☐	☐
Vegetables	☐	☐	☐	☐	☐
Fruits	☐	☐	☐	☐	☐
Fish/Meat	☐	☐	☐	☐	☐
Sugary Drinks	☐	☐	☐	☐	☐

21. **How many glasses (cup) of water do you drink per day?**

- o ☐ 1–2 glasses
- o ☐ 3–4 glasses

- o ☐ 5–6 glasses

- o ☐ 7–8 glasses

- o ☐ More than 8 glasses

Section C: Nutritional Status Parameters (To Be Completed by Researcher)

22. **Height (cm):** _____

23. **Weight (kg):** _____

Section D: Factors Influencing Dietary Habits

24. **Who decides what food to buy and prepare at home?**

- o ☐ Myself

- o ☐ Parents

- o ☐ Guardians

- o ☐ School

- o ☐ Other (specify): _____

25. **Do cultural or religious beliefs influence what you eat?**

- o ☐ Yes

- o ☐ No

- o If yes, specify: _____

26. **What prevents you from eating healthy foods? (Check all that apply):**

- o ☐ Cost

- o ☐ Availability

- o ☐ Taste preference

- o ☐ Family food choices

- o ☐ Lack of knowledge

- o ☐ Time constraints

- o ☐ Nothing prevents me

- o ☐ Other: _____

27. **How far is the nearest market from your home?**

- o ☐ Less than 10 minutes
- o ☐ 10-30 minutes
- o ☐ More than 30 minutes

28. **Do you think your current diet is healthy?**
- o ☐ Very unhealthy
- o ☐ Unhealthy
- o ☐ Neutral
- o ☐ Healthy
- o ☐ Very healthy

Section E: Physical Activity and Lifestyle

29. **How many days per week do you engage in physical exercise or sports?**
- o ☐ 0 days
- o ☐ 1–2 days
- o ☐ 3–4 days
- o ☐ 5–6 days
- o ☐ 7 days

30. **How many hours per day do you spend watching TV or using electronic devices?**
- o ☐ Less than 1 hour
- o ☐ 1–2 hours
- o ☐ 3–4 hours
- o ☐ 5–6 hours
- o ☐ More than 6 hours

31. **How many hours do you sleep at night on average?**
- o ☐ Less than 6 hours
- o ☐ 6–7 hours
- o ☐ 8–9 hours
- o ☐ More than 9 hours

Thank you for participating in this survey. Your responses will help improve adolescent nutrition in the Ashaiman Municipality.

APPENDIX IV: ETHICAL CLEARANCE FROM ENSIGN GLOBAL UNIVERSITY

ENSIGN GLOBAL
UNIVERSITY

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YOUR REF:

August 4, 2025

INSTITUTIONAL REVIEW BOARD SECRETARIAT

Esther Ewurabena Naadu Apeanyo
Ensign Global University
Kpong.

Dear Esther,

ETHICAL CLEARANCE TO UNDERTAKE POSTGRADUATE RESEARCH

At the General Research Proposals Review Meeting of the *INSTITUTIONAL REVIEW BOARD* *(IRB)* of Ensign Global University held on Friday, August 1, 2025, your research proposal entitled **"Dietary Habits, Nutritional Status and Related Factors Among Early-Stage Adolescents in the Ashaiman Municipality of the Greater Accra Region, Ghana"** was considered.

You have been granted Ethical Clearance to collect data for the said research under academic supervision within the IRB's specified frameworks and guidelines.

We wish you all the best.

Sincerely,

Dr. (Mrs.) Rebecca Acquaah-Arhin
IRB Chairperson

APPENDIX V: APPROVAL LETTER FROM THE ASHAIMAN EDUCATION (DIRECTORATE) OFFICE

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APPROVAL LETTER

This is to introduce Miss Esther Ewurabena Naadu Apeanyo, a Master of Public Health student of Ensign Global University to you. She has been granted permission to conduct her academic research in our public schools.

She would administer questionnaires and collect anthropometric data (height and weight) from the early-stage adolescents.

You are to offer her the needed assistance to enable her fulfill the academic requirement of her programme.

Thank you.

....
CLIFFORD HENAKU BUDU (MR)
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