ENSIGN GLOBAL COLLEGE

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DIETARY PRACTICES AND ASSOCIATED FACTORS AMONG ADOLESCENTS IN GHANA: ANALYSIS OF GLOBAL SCHOOL-BASED HEALTH SURVEY DATA

BY

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DECLARATION

I, MUSFIRAH OSMAN NAFEES, hereby declare that except for the references made to other people's work which I have duly acknowledged, this research work which is my original work has neither in whole nor in part been presented to the University or elsewhere for another degree.

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DEDICATION

I dedicate this work to my supervisor, mother, and brother.

ABSTRACT

Background: Adolescence is a critical stage in the formation of lifelong dietary habits. However, current trends among Ghanaian adolescents indicate a shift towards less nutritious food choices, which can pose a threat to their physical and mental well-being. Unhealthy dietary habits during this developmental phase can lead to long-term health problems, including obesity and diet-related chronic diseases.

Objective: This study aims to investigate the dietary practices of in-school adolescents in Ghana, focusing on sociodemographic disparities and factors influencing their dietary decisions.

Methodology: Data for this cross-sectional analysis will be sourced from the Global School-Based Student Health Survey (GSHS) 2012 edition, involving 1,984 in-school adolescents in senior high schools. Dietary practices, the outcome variable, will be categorized into healthy and unhealthy dietary practices. Sociodemographic influences will be assessed through the Chi-square test, and logistic regression will explore the impact of individual traits on healthy eating prevalence. Results will be presented through adjusted odds ratios (aOR) with corresponding confidence intervals, and statistical significance will be set at a p-value < 0.05. Data analysis will be conducted using Stata version 17.0.

Results: It was observed that generally, almost all (92.4%) of the adolescents practiced healthy dietary practices. About two-thirds (75.4%) and majority (87.5%) of the adolescents ate fruits and vegetables in the past thirty days preceding the survey respectively. In terms of lifestyle practices of adolescents associated with dietary practices, it was observed that drug use, being obese and using amphetamine was statistically significantly associated with dietary practices.

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Table of Contents

LIST OF ACRONYMS

CDC	Center for Disease Control
CAADP	Comprehensive Africa Agriculture Development Programme
FFQ	Food Frequency Questionnaire
GDP	Gross Domestic Product
GSHS	Global School-Based Health Survey
JHS	Junior High School
MMDAs	Metropolitan Municipal District Assemblies
NCDS	Non-Communicable Diseases
SHS	Senior High School
USD	United States Dollar
WHO	World Health Organization

LIST OF TABLES AND FIGURES

CHAPTER ONE

INTRODUCTION

1.1. Background

According to the WHO, adolescence may be described as the phase of life between infancy and adulthood, spanning between 10 and 19. Adolescence is the second most critical phase of physical development in our life's cycle after the first year and 25% of adult height and 45% of skeletal muscle is acquired during this era (Hadush et al., 2021; Nti et al., 2012). This period is vital because it establishes the basis for a healthy life. Lifelong eating patterns or habits frequently emerge in adolescence (Hormenu, 2022).

This stage of development normally indicates a time of fast mental, physical, psychological, and cognitive growth, all of which drive the dietary demands of teenagers, since optimal cognitive development is vital for scholastic achievement (Tandoh et al., 2021). Therefore, the appropriate eating habits must be inculcated in teenagers during this vital time of their growth. Nutrition has an essential influence in the present and future health of adolescents. A sustained balanced diet throughout adolescence may avoid most nutritional inadequacies. Growth-related concerns during the first decade of life may be minimized, and also the risk of non-communicable diseases (NCDs) later on in adulthood is lowered because of healthy eating practices and epidemiologic transition (Abizari & Ali, 2019; Abrahams et al., 2011; Agedew et al., 2022). The globe is witnessing considerable changes in food, nutritional status, illness patterns, and life expectancy, and these changes occur as three discrete transition phases (Abrahams et al., 2011). The demographic transition is a movement from a time of high fertility and mortality to one of low fertility and mortality. This is driven by increased earnings, education, employment, and improvement in health condition (Abrahams et al., 2011). An epidemiologic transformation

follows this change. As mortality declined during the demographic transition, there was a reduction in acute infectious illnesses, while chronic degenerative diseases acquired significance, reflecting the epidemiologic shift (Amuna & Zotor, 2008). Evidence of this change is related with the epidemics of illnesses of the heart and blood vessels, hypertension, type 2 diabetes, malignancies, and other chronic diseases (Amuna & Zotor, 2008). The nutrition transition is characterized by shifting diets (unhealthy food choices), growing urbanization, and declining physical activity (Casari et al., 2022). This shift leading to an obese population is also assumed to precede or co-occur with the demographic (McAllister et al., 2009).

Popkin refers to the dietary shift as unfolding in five patterns. During the first pattern (gathering food), this diet represents hunter-gatherer societies and is rich in carbs and fiber and low in fat, especially saturated fat (Popkin, 2002). Activity level is high, which leads in minimal obesity. The following trend is famine; dietary variety is diminished, while food shortage is raised (Popkin, 2002). The hunger pattern is considered to be connected with low height (Popkin, 2002). The kind of physical activity may have dropped, but activity levels remained same. During the third pattern (receding famine), the intake of starch or carbs declines, and there is an increased consumption of fruits and vegetables, and physical activity levels start to drop (Appiah et al., 2021; Ogum Alangea et al., 2018; Popkin, 2006).

In the fourth type (nutrition-related non-communicable illness), food intake is high in fat, sugar, and cholesterol and low in fiber (Popkin, 1993). There is also an increase in sedentary living, which leads in an increasing prevalence of obesity (Islam et al., 2019). The last pattern is behavioral transformation. This is defined by a desire to extend life and avoid or postpone degenerative illnesses. It is distinguished by an increased intake of complex carbohydrates, fruits, and vegetables and a reduced consumption of fat, processed foods, meat, and dairy

products (Abrahams et al., 2011; Popkin, 1993, 1994, 2002, 2006). Different nations or areas are at varying stages of this transformation. Even in the same nation, urban, rural, and other portions of the country might be at various phases of this nutrition transition at any one moment (Popkin & Ng, 2022).

Low- and middle-income countries already have an existing burden of communicable illnesses and malnutrition and are increasingly burdened by non-communicable diseases (NCDs), which previously were considered a concern for the rich world (World Health Organization, 2024). This dietary change is an important driver or risk factor for growing NCDs in emerging nations. "Dietary changes appear to be shifting universally towards a diet dominated by higher intakes of animal and partially hydrogenated fats and lower intakes of fiber. Activity patterns at work, at leisure, during travel, and in the home are likewise evolving swiftly toward lower energy expenditure" (Popkin, 2006). Adolescents are mostly at school and are typically exposed to harmful dietary food choices such as processed meals, sugary drinks, and fast foods (Popkin, 2006).

In Ghana, food modifications are already having notable impacts on the health of majority of the people. Changing dietary patterns and intakes in Ghana was detected in the early 1990s and has since been increasing, putting Ghana toward the last phases of the nutrition transition (Kushitor, 2023). The Ghanaian population has moved from traditional diets (mainly plant-based and less processed) to convenient meals (including quick and processed foods) (Abizari & Ali, 2019). Urbanization and technology have also lowered the rate individuals participate in physical exercise. This is no longer simply a concern in the industrialized world but has also reached underdeveloped nations, and teenagers are also impacted by this (Boakye et al., 2023). Physical activity reduces during adolescence, and physical activity in schools declines when children no

longer participate in physical exercise (Faulkner et al., 2009).

Malnutrition in all its manifestations is a worldwide concern but is particularly severe when it happens in impoverished nations (Hadush et al., 2021). The movement in food consumption and patterns towards unhealthier alternatives has a number of harmful repercussions on the population. Some of these impacts include vitamin A deficiency, iron deficiency anemia, obesity, underweight, stunting, and heightened risks for NCDs such as type 2 diabetes and heart disease (Abizari & Ali, 2019; Agedew et al., 2022; Akoto et al., 2022; Aryeetey et al., 2017; Hormenu, 2022).

Dietary patterns might have crucial public health interventions (Hu, 2002). Dietary pattern analysis is a functional epidemiological strategy to determining the association between total diet and illness conditions (Abizari & Ali, 2019). Dietary patterns are also readily comprehended by and exploited by the public (Hu, 2002). This research, therefore, intends to evaluate the eating habits and related characteristics among teenagers in Ghana.

1.2. Problem Statement

The prevalence of overweight and obesity among adolescents is on the rise in developing countries such as Ghana. This increase in prevalence has been partly attributed to the nutrition transition, urbanization, industrialization, and economic growth. The issue of overweight among the Ghanaian population is a matter of concern, especially amongst adolescents who may have to face a lot of social and medical negativities associated with obesity. This challenge has made the need for the study necessary to unearth information necessary to understand the phenomenon and tackle it. Existing research has focused more on obesity generally, with limited research focused

on adolescents who are at a crossroads in developing and transitioning between childhood and adulthood.

Ghana is among a few sub-Saharan African nations in the latter phases of the nutrition transition, where a change in food dynamics is already influencing the general population's health (Liguori et al., 2022). There is rising evidence of a coexisting burden of underweight, overweight, and obesity among school-going adolescents in Ghana (Abizari & Ali, 2019). There has been a rise in overweight and obesity from 8.7% in 2007 to 13% in 2015 (Abizari & Ali, 2019). Other research analyzed showed a growth in overweight and obesity from 11% to 18% between 2013 and 2017 (Coomson & Aryeetey, 2022; Yussif et al., 2024). The increase in overweight and obesity among young people is a significant concern, as it often leads to long-term health issues such as hypertension and increased cancer risk later in life, with data showing an increase in breast, cervical, and liver cancers (Coomson & Aryeetey, 2022), with women suffering more from the prevalence of underweight, overweight/obesity, and anemia than men (Kushitor et al., 2020). The overweight and obesity prevalence reported between 7.8% and 25.9% (Kumah et al., 2015), and 44% of rural teenage females are anemic, and over 60% in the northern coastal savannah areas, thereby confirming the double burden of malnutrition among adolescents in Ghana (Azupogo et al., 2022).

Adolescents are prone to make harmful food choices and frequently fail to achieve dietary guidelines for optimal nutritional status, health, and particular nutrient demands (Hormenu, 2022). Adolescents cannot fulfill the necessary nutritional needs due of fast physical growth, psychological development, and bad food patterns. Adolescents commonly eat high-dense fatty and sugary fast meals (Sinai et al., 2021). There is also a lower presence of fruits and vegetables in meals. These diets are heavy in calories, sugar, saturated, and trans-fat and are drivers of the

growing obesity incidence among teenagers (Akoto et al., 2022). Adolescents in Ghana often have dietary habits largely defined by eating sugar-sweetened snacks, energy drinks, and soft drinks (Akoto et al., 2022). Because of the severe repercussions associated with malnutrition, it is now of public health concern, therefore the need to study its prevalence and the variables that drive it (De & Chattopadhyay, 2019). This research will therefore strive to contribute to bridging the information gap in understanding malnutrition and obesity and how to manage the situation amongst teenage kids in Ghana.

1.3. Rationale of the Study

The growing incidence of overweight and obesity among teenagers in Ghana constitutes a serious public health problem (Laar et al., 2020). Understanding the eating behaviors and related variables affecting these circumstances is crucial to establish effective treatments and policies and better understand the issue. This research, therefore, intends to offer a complete analysis of these dietary behaviors using data from the Global School-Based Health Survey (GSBSG) to recommend focused methods for improving adolescent health and dietary practices.
Adolescents are less prone to illnesses and suffer less from severe life-threatening and chronic diseases, and this causes most governments concentrate health resources more on children and pregnant women (Buxton, 2014). Obesity and overweight are related with various health concerns, including an increased likelihood of chronic diseases such diabetes, hypertension, and several forms of cancer (WHO, 2024b). Adolescence is a key era of human growth and development, and hence, dietary behaviors during this period may have long-term repercussions for health (Moore Heslin & McNulty, 2023). By identifying and assessing teenage eating

behaviors, this research attempts to shed light on the variables leading to these diseases and assist create preventative interventions.

Furthermore, the outcomes of this research will give useful insights for legislators and health authorities. It will help to evidence-based policy-making by analyzing adolescents' food habits and related determinants. Also, policymakers may establish evidence-based treatments and educational programs targeted to meet individual needs and risk factors for successfully preventing and controlling overweight and obesity.

Also, this research is directly applicable to various Sustainable Development Goals (SDGs), such as SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-Being), and SDG 4 (Quality Education). Thus, by addressing the issue of overweight and obesity, the study contributes to improving nutritional quality and dietary practices among adolescents, supports efforts to reduce non-communicable diseases and promote healthy lifestyles among young people, and improves dietary practices, which go a long way to enhance overall well-being and academic performance. Dietary changes among teenagers in Ghana is a worry because of a move from traditional meals (low in fat, fruits and vegetables) to diets deficient in variety and calorie-rich processed foods. Adolescents spend a lot of their time in school and consequently their educational environment is likely to impact their food choices.

The results and conclusions of this research will enlighten stakeholders and serve as a baseline information for the creation of effective nutrition and health intervention programs which would assist address concerns linked to unhealthy food habits among teenagers in Ghana. Research on fundamental teenage eating patterns is similarly sparse (Buxton, 2014). This research would thus, investigate eating habits and its related characteristics among teenagers in Ghana and would depend on data from the Global School-based student health survey. The outcomes of this

research will guide the development of policies and programs targeted at improving teenage nutrition and reducing obesity. Matters such as establishing programs to teach teenagers about healthy eating habits and implementing regulations that encourage healthy eating habits and food alternatives in schools and communities. The research offers a platform for successful public health interventions and contributes to reaching relevant SDGs by examining food behaviors and related determinants. The findings will be essential in designing policies and initiatives to enhance teenage health and well-being.

1.4 Conceptual Framework

A CONCEPTUAL FRAMEWORK OF DIETARY PRACTICES AMONG ADOLESCENTS AND THE FACTORS INFLUENCING THEM.

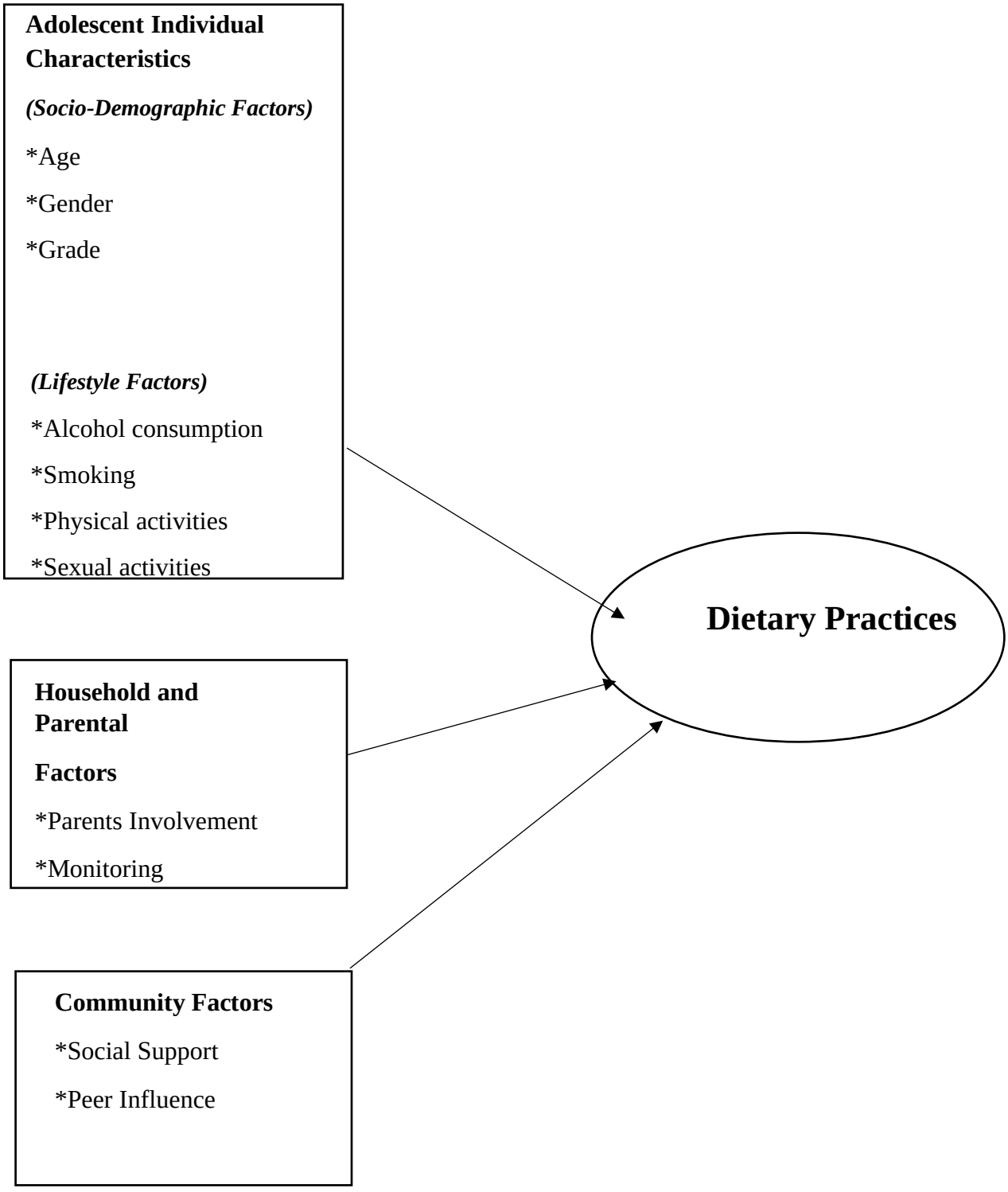

Figure 1 Source: Adapted from UNICEF's framework of nutritional status among adolescents (UNICEF Indonesia 2017).

The conceptual framework was taken from UNICEF's framework of nutritional status among adolescents (UNICEF, 2021). The model revealed patterns and risk factors of the double burden of malnutrition among adolescent girls and boys in Indonesia. The variables explored as factors associated with adolescent nutritional status included community-level characteristics, including district and residence (urban vs. rural), household/parental-level characteristics, and adolescent-level characteristics, including sociodemographic status, morbidity, dietary intake, physical activity, and others.

This framework was modified since it meets the aims of this research. It was then adjusted to omit certain variables. In this modified paradigm, the major dependent variable is dietary behaviors and there are three independent variables which comprise adolescent individual characteristics, household and parental, and community influences. There are two key sub-variables under the adolescent individual factors and these are sociodemographic factors which include age, gender, and grade of the teenager, and lifestyle factors which include alcohol intake, smoking, physical and sexual activity. Under the household and parental components, we have parental participation and supervision. The community aspects are social support and peer influence. This paradigm indicates that these three variables impact the primary dependent component, dietary behaviors.

1.5 Research Questions

1. What are the dietary practices of adolescents enrolled in the GSHS?
2. What is the correlation between lifestyle factors and dietary practices?
3. What are the factors contributing to dietary practices of adolescents enrolled in GSHS?

1.6 General Objective

This study seeks to determine the dietary patterns and its associated factors among adolescents in Ghana using GSHS data.

1.7 Specific Objectives

1. To investigate and analyze the dietary practices of adolescents enrolled in the GSHS.
2. To explore the correlation between lifestyle factors and dietary practices of adolescents enrolled in the GSHS.
3. To assess the factors contributing to the dietary practices of adolescents enrolled in GSHS.

1.8 Profile of Study Area

Ghana is a nation situated in western Africa. It shares borders with the Ivory Coast in the west, Burkina Faso in the north, Togo in the east, and the Gulf of Guinea and the Atlantic Ocean to the south. Ghana has a total land area of 238,535 km2 (92,099 sq mi), with varied biomes ranging from coastal savannas to tropical rainforests. Ghana is the second-most populous nation in West Africa, just behind Nigeria, with over 31 million inhabitants (as of the 2021 census). It has Accra as its capital and biggest city; other major cities include Kumasi, Tamale, and Sekondi-Takoradi.

Ghana is a lower-middle-income nation with an anticipated population of more than 32 million people in 2022 and a GDP (Gross Domestic Product) per capita of USD (United States Dollar) 2,445 in 2021. Ghana being a lower-middle-income country has significant rates of poverty and malnutrition notwithstanding national gains in eradicating acute malnutrition. Ghana being in the latter phases of the nutrition transition implies dietary patterns of teenagers are also changing towards unhealthier dietary patterns and practices. It is thus vital to find out from the literature the eating habits among teenagers and the variables that impact these patterns.

The educational system in Ghana is arranged into three primary stages which are basic education, secondary education, and university education. Basic education lasts 12 years (ages 4–15), consisting of a 6-year primary cycle and a 3-year junior high school (JHS) cycle, and is obligatory and free for all pupils. The curriculum is described as "the minimum period of schooling needed to ensure that children acquire basic literacy, numeracy, and problem-solving skills as well as skills for creativity and healthy living". Secondary education consists of a junior phase and a senior phase, each lasting 3 years.

The junior secondary phase complete the required school-age years. Children are then generally 15 years old. The senior phase covers senior high school, technical and vocational schools, and specialized institutions, and is not required. Tertiary education encompasses universities, polytechnics, and colleges of education. The Ghanaian educational system focuses a heavy emphasis on reading and numeracy, with English being the predominant language of teaching. The curriculum includes a broad variety of disciplines, including mathematics, science, social studies, and vocational skills. In recent years, there has been a movement to include more technology and practical skills into the curriculum to better prepare students for the job.

The Ministry of Education is responsible for education, supervising several institutions like as

the Ghana Education Service, the Ghana Library Board, and the National Commission for UNESCO. It administers policies for elementary and secondary education, including the Curriculum Research and Development Division. The Ministry is represented by regional and district offices, organizing national exams, and supervising technical and vocational education via the Council for Technical and Vocational Education and Training (TVET).

Figure 2: ***MAP OF GHANA SHOWING ALL THE 16 REGIONS AND THEIR CAPITALS.***

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

A literature review is a comprehensive and critical analysis of existing research and scholarly articles on a specific topic or research question. It aims to provide an overview of the current state of knowledge in a particular field, identify gaps, and highlight key themes, methodologies, and findings. A well-conducted literature review helps researchers understand the existing literature's strengths and weaknesses, informing the development of new research questions and methodologies.

The purpose of this chapter is to review the literature pertinent to the study on dietary practices and associated factors among adolescents in Ghana. This review aims to provide a comprehensive understanding of the subject by focusing on several key areas. Firstly, it examines the concept of healthy dietary practices, including global, regional, and local perspectives on what constitutes a balanced and nutritious diet. Secondly, it explores adolescent lifestyle and dietary patterns, including consumption behaviors, physical activity levels, and the influence of socioeconomic and environmental factors. Lastly, it evaluates existing interventions aimed at improving dietary practices among adolescents, highlighting both successful strategies and areas requiring further attention. By analyzing these topics, the chapter sets the stage for a detailed exploration of how dietary practices and associated factors impact adolescent health in Ghana, using data from the Global School-Based Health Survey (GSBSG).

The literature review on dietary practices and associated factors among adolescents in Ghana highlights the need for further research to address the knowledge gaps and develop effective interventions to promote healthy dietary behaviors among this population. By leveraging the insights gained from existing literature and analyzing GSHS data, this thesis aims to contribute to developing evidence-based strategies for improving adolescent nutrition in Ghana.

It emphasizes the critical role of healthy dietary practices in meeting the nutritional requirements of adolescents, maintaining energy balance, supporting cognitive function, and establishing lifelong habits that influence long-term health outcomes. By addressing these factors, interventions can be developed to promote healthy eating habits among adolescents, thus contributing to their overall well-being.

2.1 What is Health Dietary Practice

Healthy dietary practices are universally defined by guidelines that emphasize a balanced intake of nutrients, including adequate fruits and vegetables, a proper balance of macronutrients, and adequate hydration (Cena & Calder, 2020). According to global health organizations like the World Health Organization (WHO), a healthy diet helps prevent chronic diseases and supports overall well-being (WHO, 2024a). Key recommendations include consuming at least 400 grams of fruits and vegetables daily and reducing the intake of saturated fats, trans fats, and added sugars (WHO, 2020). These guidelines tackle global health issues such as obesity and cardiovascular diseases, providing a foundation for public health nutrition worldwide (Chen et al., 2023).

Regionally, dietary guidelines are adapted to reflect local dietary habits and health challenges (Woodside et al., 2022). For example, European guidelines emphasize reducing red and processed meat consumption and increasing dietary fiber (Cocking et al., 2020). The Comprehensive Africa Agriculture Development Programme (CAADP) promotes traditional diets rich in diverse food groups while addressing food security and malnutrition (CAADP & NEPAD, 2009). Regional studies, such as those in South Africa, highlight the impact of dietary shifts on public health, focusing on the transition to high-energy, low-nutrient foods and its implications for obesity and related conditions (Madlala et al., 2022).

In Ghana, dietary guidelines promote traditional foods like plantains, yams, and legumes, balanced with modern practices to reduce high-calorie, low-nutrient foods (Ministry of Food and Agriculture & University of Ghana School of Public Health, 2023). Local studies reveal adolescent dietary patterns, including high consumption of sugary snacks and low fruit and vegetable intake, contributing to rising obesity rates (Man et al., 2020). The impact of urbanization on changing food consumption patterns is emphasized and it indicates a shift toward processed foods in cities (FAO, 2023). Understanding these local dietary practices is crucial for designing effective nutritional interventions tailored to Ghanaian populations' specific needs and cultural contexts (Aberman et al., 2022).

2.2 Factors Influencing Dietary Practices among Adolescents

The dietary practices of adolescents in Ghana have been a subject of interest for researchers due to their potential impact on health outcomes (Hormenu, 2022). Several studies have examined Ghana's adolescent dietary patterns, food choices, and nutritional intake (Akoto et al., 2022; Azupogo et al., 2022). These studies have highlighted the prevalence of unhealthy dietary

practices, including low consumption of fruits and vegetables, highly processed foods, and inadequate micronutrient intake (Kushitor et al., 2023). Furthermore, socioeconomic factors such as household income, parental education, and urbanization are significant determinants of dietary practices among Ghanaian adolescents (Hormenu, 2022).

In addition to socioeconomic factors, several other determinants influence the dietary practices of adolescents in Ghana. Peer influence, media exposure, cultural norms, and food availability influence adolescents' dietary choices (Chung et al., 2021; Islam et al., 2019). Furthermore, the literature has also explored the impact of nutrition knowledge, food insecurity, and access to nutrition education programs on dietary practices among adolescents (Edin et al., 2024; Mortazavi et al., 2021)

The Global School-Based Health Survey (GSHS) provides valuable data on various health-related behaviors, including dietary practices, among adolescents in Ghana (Sheet, 2012). Analysis of GSHS data has revealed important insights into the prevalence of unhealthy dietary behaviors, such as high consumption of sugary beverages and low intake of essential nutrients among Ghanaian adolescents (Sheet, 2012). Furthermore, the survey data has allowed for identifying risk factors and protective factors associated with dietary practices, enabling a better understanding of the determinants of adolescent nutrition in Ghana.

Adolescence is a critical period of growth and development marked by rapid physical, cognitive, physiological, psychological, and social changes (Hayford et al., 2015). During this phase, nutritional needs are heightened, making healthy dietary practices crucial for optimal well-being (Marshall et al., 2022). The significance of understanding and promoting appropriate dietary

habits in adolescence cannot be overstated, as they lay the foundation for lifelong health (Brown et al., 2021).

Adolescence is a critical phase of human development marked by rapid physical growth, cognitive maturation, and the establishment of lifelong health habits (Appiah et al., 2021). As adolescents undergo dynamic changes, their nutritional needs become increasingly vital for fostering optimal growth, preventing nutritional deficiencies, and mitigating the risk of chronic diseases later in life (Soliman et al., 2022). Dietary practices during this period play a pivotal role in shaping immediate health outcomes and long-term well-being (Liu et al., 2022).

Sociocultural norms, economic constraints, peer influence, and access to nutritious food all play integral roles in shaping dietary behaviors (Singh et al., 2022). Consequently, any comprehensive examination of adolescent dietary practices necessitates an exploration of the broader social, economic, and cultural landscape in which these practices unfold (Story et al., 2009; Fulkerson et al., 2018).

During this developmental stage, poor dietary habits can lead to various health issues, including malnutrition, micronutrient deficiencies, and an increased susceptibility to diet-related diseases such as obesity and cardiovascular disorders (Kiani et al., 2022). Conversely, adopting and maintaining healthy dietary practices can contribute to improved cognitive function, enhanced academic performance, and a reduced risk of chronic diseases in adulthood (Puri et al., 2023; Tandoh et al., 2021).

2.3 Importance of Healthy Dietary Practices

The heightened on nutritional needs underline the significance of appropriate food behaviors among teenagers, the necessity for energy balance, the effect on cognitive function, and the ability to form lifetime habits that affect long-term health consequences (Saavedra & Prentice, 2023).

Adolescents experience rapid growth, hormonal changes, and the development of various organs, necessitating increased intake of essential nutrients such as proteins, calcium, iron, and vitamins. Adequate nutrition during this period supports proper physical and cognitive development (Sawyer et al., 2012). Adolescents often undergo changes in body composition, including increased muscle mass and bone density (Osei-Kwasi et al., 2020). Proper nutrition helps maintain a healthy energy balance, preventing issues like malnutrition or obesity, which can have long-term health implications (Larson & Story, 2009; Neumark-Sztainer et al., 2018).

Nutrition has a critical impact in brain function and academic achievement. Certain nutrients, notably omega-3 fatty acids and antioxidants, are critical for brain growth and function (Pearson, 2023). Adolescence is a pivotal time for developing eating habits that frequently remain into adulthood. Encouraging good dietary habits at this period may lead to a decreased risk of chronic illnesses later in life (Sawyer et al., 2012; Larson & Story, 2009).

2.4 The Significance of Understanding Dietary Habits

The significance of understanding dietary habits among adolescents in Ghana lies in the multifaceted influences on their eating behaviors and the potential impact on public health

(Hormenu, 2022). This understanding is crucial for designing effective interventions to promote healthy eating habits, prevent eating disorders, respect cultural and social norms, and address specific challenges this population faces (Magalhães et al., 2022). Adolescents are at a stage where nutritional requirements are heightened to support the demands of puberty, skeletal development, and organ maturation (Soliman et al., 2022). Concurrently, they often establish lifestyle patterns that can persist into adulthood, making this period a crucial window of opportunity for interventions to cultivate lifelong healthy eating habits (Chaudhary et al., 2020).

Adolescent dietary habits are influenced by biological, psychological, and social factors (Liguori et al., 2022). Understanding these influences is essential for designing effective interventions to promote healthy eating (Hantira et al., 2023). Adolescence is a vulnerable period for the development of eating disorders (Assina & Heary, 2014). Recognizing unhealthy dietary practices early can aid in prevention and timely intervention (Chen et al., 2023)

Cultural and social factors significantly impact adolescent dietary choices (Abera et al., 2020). Knowledge of these influences is crucial for tailoring nutritional guidance that respects diverse cultural norms and promotes healthy eating within those contexts (Nemec, 2020). Identifying specific dietary challenges faced by adolescents allows for targeted interventions. Addressing deficiencies in micronutrients or promoting awareness about balanced nutrition can be tailored to the unique needs of this age group (Sharifi et al., 2022). A comprehensive analysis of dietary practices among Ghanaian adolescents provides valuable insights for public health initiatives. Targeted interventions can be designed to address specific challenges, contributing to improved overall health outcomes in the adolescent population (Isaacs et al., 2024). Investigating factors associated with unhealthy dietary practices allows for the identification of potential risk factors.

This knowledge is essential for designing effective interventions and policies to promote healthy eating behaviors (Chaudhary et al., 2020)

Utilizing data from the Global School-Based Health Survey (GSHS) provides a standardized and comprehensive approach to examining dietary practices (Sheet, 2012). This enables comparisons across regions and countries, facilitating a broader understanding of the factors influencing adolescent nutrition

2.5 Adolescent Lifestyle and Dietary Practice

Understanding adolescent lifestyle could address largely the challenges associated with back dietary practices of adolescents and provide a means to curbing it (Sinai et al., 2021)s.

2.5.1 Dietary Patterns and Preferences

Adolescents are often attracted to and consume convenience foods, such as fast food and sugary beverages, due to their accessibility and appeal to adolescents (Ogum Alangea et al., 2018). Studies consistently show high consumption rates of processed foods by adolescents (Akoto et al., 2022). These foods are typically high in added sugars, unhealthy fats, and sodium (Chen et al., 2023). In Ghana, the rise of fast-food outlets, both indigenous and international, and the prevalence of sugary drinks, which have become too common, highly available, and cheaper, contribute to poor dietary patterns among adolescents (Kushitor, 2023). Research has shown that overweight and obesity are mainly the cause of these fatty and sugary foods, which can also cause other health issues such as metabolic syndrome and dental problems (Faruque et al., 2019).

In Ghana, cultural preferences and socioeconomic factors also influence the availability and consumption of the fruits and vegetables (Appiah et al., 2021). Efforts to increase fruit and vegetable intake through school programs and community initiatives are important for improving adolescent nutrition and preventing chronic diseases (Ili´c et al., 2022).

2.5.2 Physical Activity and Sedentary Behavior

The Global School-Based Student Health Survey (GSHS) data indicates that adolescent physical activity levels in Ghana are often inadequate (Sheet, 2012). Encouraging participation in sports and other physical activities can help mitigate the risks associated with sedentary behavior and promote a healthier lifestyle (Alupo & Lu, 2023)s. Research have shown that sports and activeness is a great means to delaing with obesity and overweight. In addition, increased screen time, especially the time spent on smartphones, and computers, is linked to sedentary behavior and poor dietary choices. High screen time is associated with reduced physical activity and increased consumption of unhealthy snacks. Studies have found that excessive screen time among adolescents contributes to weight gain and other health issues. Addressing sedentary behavior through interventions that promote active screen time alternatives and limit recreational screen use could positively impact dietary practices and overall health.

2.5.3 Socioeconomic, Environmental, and psychological Influences

Family dynamics and socioeconomic status play a significant role in shaping adolescent dietary practices. The food choices of food choices, how often families prepare meals at home, and other socioeconomic conditions also influence what adolescents eat. For instance, in Ghana, many middle-income earners spend a lot of time at work and out of the home, pursuing higher

education to the extent that time to prepare food at home or eat well becomes a challenge. This practice is automatically taught to the younger ones, making them pick up lifestyles of not being used to eating homemade meals. These socioeconomic disparities can affect dietary patterns and access to nutritious foods, highlighting the need for targeted interventions that address these inequalities. The same happens at schools as well, with peer influences and fewer break periods for students.

2.6 Patterns and Trends in Adolescent Dietary Practices

The prevalence of malnutrition remains a global concern among adolescents, manifesting in both undernutrition and micronutrient deficiencies and this has garnered significant attention in global health research. The World Health Organization (WHO) has highlighted the widespread impact of malnutrition, particularly iron deficiency and estimates that over 800 million adolescents suffer from iron deficiency, impacting cognitive development and overall health (WHO, 2021). In many low- and middle-income countries, adolescents face challenges such as inadequate access to nutritious foods, contributing to stunting and other forms of malnutrition.

Conversely, a comparable increase in obesity rates among teenagers has been documented, notably in high-income nations. The Global Burden of Disease Study revealed a large rise in the incidence of obesity among teenagers aged 10-19 from 1975 to 2016, with rates doubling in some countries (NCD Risk Factor Collaboration, 2017). This tendency has been ascribed to reasons such as sedentary lifestyles, increasing intake of high-calorie, low-nutrient meals, and insufficient physical exercise.

The association between adolescents' dietary habits and health risks has been extensively studied. Poor dietary choices have been linked not only to malnutrition and obesity but also to an increased risk of chronic diseases such as cardiovascular diseases, diabetes, and certain types of cancer (Popkin et al., 2020). Furthermore, the long-term consequences of unhealthy diets during adolescence on adult health and well-being have been a subject of growing concern.

Dietary practices in Sub-Saharan Africa are influenced by a wide range of factors, including cultural traditions, regional availability of food, and socioeconomic conditions. A study by Holdsworth and Osei-Kwasi (2018) highlighted the diversity of dietary habits across different countries in the region, emphasizing the impact of cultural and regional variations on nutritional patterns. The authors noted that traditional diets in Sub-Saharan Africa are often characterized by a reliance on starchy staples such as maize, cassava, and millet, along with a variety of legumes and vegetables.

Cultural and regional variations in dietary habits have been found to significantly influence adolescent nutrition in Sub-Saharan Africa. For example, a study by Neumann et al. (2019) identified differences in food preferences and consumption patterns among adolescents from urban and rural areas, with urban adolescents showing a higher intake of processed and fast foods compared to their rural counterparts. The authors emphasized the need to consider these variations when designing interventions to improve adolescent nutrition in the region.

The role of cultural beliefs and practices in shaping dietary choices has been explored in the literature. For instance, traditional food taboos and customs related to food preparation and consumption have been found to impact dietary diversity and nutrient intake among adolescents (Marquis et al., 2017). Understanding these cultural influences is crucial for developing

culturally sensitive nutrition programs that are effective in addressing the unique dietary needs of adolescents in different regions of Sub-Saharan Africa.

In addition to cultural factors, regional variations in food availability and access have been shown to affect dietary practices among adolescents. A study by Arimond and Ruel (2004) highlighted the importance of considering local food environments and market dynamics in promoting healthy diets for adolescents. The authors emphasized the need for context-specific interventions that take into account the diverse food landscapes across different regions in Sub-Saharan Africa.

Ghana, located in West Africa, is characterized by a rich cultural diversity and a variety of traditional dietary practices. Adolescents in Ghana, like in many other parts of the world, face unique challenges in maintaining a balanced and nutritious diet. Several studies have investigated the dietary practices among adolescents in Ghana, highlighting both nutritional deficiencies and excesses, as well as the cultural and economic factors influencing their dietary choices.

A study by Abizari et al. (2017) found that adolescents in Ghana commonly experience deficiencies in key nutrients such as iron, vitamin A, and zinc. The authors noted that poor dietary diversity and low consumption of animal source foods contribute to these deficiencies. Additionally, the consumption of energy-dense, nutrient-poor foods has been linked to an increasing prevalence of overweight and obesity among Ghanaian adolescents (Amoah-Boateng et al., 2020). This dual burden of malnutrition underscores the complexity of dietary challenges faced by adolescents in Ghana.

Cultural beliefs and practices play a significant role in shaping the dietary choices of adolescents in Ghana. For instance, traditional food taboos and customs related to food preparation and consumption have been found to influence dietary diversity and nutrient intake (Marquis et al., 2017). Moreover, a study by Amugsi et al. (2016) highlighted the influence of cultural norms on food preferences and meal patterns among Ghanaian adolescents, emphasizing the need to consider cultural factors when developing nutrition interventions.

Economic variables, particularly family income and food availability, can impact the eating behaviors of teenagers in Ghana. A research by Amugsi et al. (2017) indicated that socioeconomic status was connected with differences in dietary variety among teenagers, with those from lower-income homes having restricted access to various and nutritious foods. Additionally, the availability and cost of healthful foods were found as major factors of dietary choices among teenagers in urban and rural locations (Amugsi et al., 2017).

Interventions aimed at addressing the dietary challenges among Ghanaian adolescents should consider the cultural and economic determinants of dietary practices. For example, community-based nutrition programs that incorporate traditional foods and respect cultural food preferences have been suggested as effective strategies to improve dietary diversity and address nutritional deficiencies (Abizari et al., 2017). Furthermore, efforts to promote nutrition education and awareness about healthy eating habits are essential for addressing both undernutrition and overnutrition among adolescents in Ghana.

2.7 Role of Schools in Shaping Dietary Habits

The role of schools in shaping the dietary habits of adolescents is significant, as they provide an environment where students can be exposed to and influenced by various food options and educational initiatives (Medeiros et al., 2022). Several school-based interventions, policies, and programs have been developed to promote healthy eating habits among adolescents (Verdonschot et al., 2023). Numerous studies have highlighted the effectiveness of school-based nutrition education programs in promoting healthy dietary practices among adolescents (Chaudhary et al., 2020). These programs often incorporate classroom-based nutrition education, cooking demonstrations, and hands-on activities to increase students' knowledge about healthy food choices and improve their eating behaviors (Medeiros et al., 2022; Verdonschot et al., 2023).

Implementing healthy school food policies, such as regulating the types of foods and beverages available in school cafeterias and vending machines, has positively impacted adolescents' dietary habits. Policies prioritizing nutritious, balanced meals and limiting the availability of unhealthy snacks and sugary drinks can improve students' dietary intake (Grigsby-Duffy et al., 2022). Farm-to-school programs aim to increase access to fresh, locally sourced fruits and vegetables in school meals (Fair et al., 2023). These programs provide students with healthier food options and educate them about the benefits of consuming locally-grown produce, influencing their dietary choices at school and home (Fair et al., 2023; Moss et al., 2013).

Engaging adolescents in school garden activities and food preparation can enhance their understanding of where food comes from and how it is prepared (Fair et al., 2023). Research suggests that involvement in school gardening and cooking activities can increase students'

consumption of fruits and vegetables (Holloway et al., 2023). Creating a supportive school environment that promotes healthy eating through initiatives such as nutrition-focused curriculum integration, food tastings, and involvement of parents and community members can contribute to fostering positive dietary habits among adolescents (Medeiros et al., 2022).

2.8 Health Implications of Adolescent Dietary Practices

Numerous studies have examined the link between adolescent dietary practices and various health outcomes, shedding light on the short-term and long-term consequences of poor dietary habits during this critical developmental period (Brown et al., 2021). The short-term health implications include obesity and poor nutrient deficiencies (Brown et al., 2021). Cardiovascular disease, type 2 diabetes, and mental health are some of the long-term health implications.

Poor dietary habits, such as excessive consumption of high-calorie, low-nutrient foods and sugary beverages, have been associated with an increased risk of obesity among adolescents (Jakobsen et al., 2023). Obesity in adolescence is linked to a range of immediate health issues, including type 2 diabetes, hypertension, and metabolic syndrome (Puri et al., 2023)

Inadequate intake of essential nutrients, such as vitamins, minerals, and fiber, due to poor dietary choices can lead to short-term health issues like fatigue, poor concentration, and compromised immune function (Kiani et al., 2022). Unhealthy dietary patterns in adolescence, characterized by high intake of processed foods, saturated fats, and added sugars, have been linked to an increased risk of developing cardiovascular disease in adulthood (Anand et al., 2016).

Poor eating habits throughout adolescence, especially those leading to excess weight gain and insulin resistance, are related with an enhanced risk of acquiring type 2 diabetes later in life (Sami et al., 2017). Emerging research shows that poor food habits throughout adolescence may have long-term ramifications for mental health, including an increased risk of depression and anxiety disorders in adulthood (Selvaraj et al., 2022).

2.9 Interventions in Adolescent Dietary Practice

Rising concerns about overweight and obesity among adolescents have resulted in various interventions being implemented globally to improve dietary practices for this demographic group (Ogum Alangea et al., 2018). These interventions, mostly school-based or community-based, provide different implementation standards (Islam et al., 2019). What is the efficacy of these interventions? Interventions aimed at improving adolescent dietary practices vary in scope and approach, including school-based programs, community initiatives, and policy measures. Understanding these interventions from a Ghanaian perspective and focusing on Ghanaian interventions are important for this study.

2.9.1 School-Based Interventions

School-based nutrition education programs are generally regarded as beneficial in changing dietary patterns among teenagers (Medeiros et al., 2022). These programs often entail incorporating nutrition education into the school curriculum, giving children with knowledge on healthy eating habits, and nurturing skills for making better food choices. In Ghana, the “School Health Education Program” (SHEP), attempts to educate pupils on balanced meals and the

benefits of physical exercise (Tuffour et al., 2023). These health nutrition education programs are also incorporated in specific courses in Ghana such as Life Skills in the past, and others. For instance, the "Healthy Schools Program" in the United States has effectively raised students' understanding about nutrition and improved their eating practices (Richardson et al., 2023). Evaluations of these programs generally show better nutritional understanding and higher intake of fruits and vegetables among participants (Hormenu, 2022).

Another key intervention is the provision of healthier school meals, which Ghana initiated under President Kufuor's term (IFPRI, 2023). These initiatives that serve healthy meals as part of the school day may drastically alter adolescents' eating behaviors. The "National School Lunch Program" in the United States and the "Midday Meal Scheme" in India are examples of such programs (Saxena & Ahmed, 2020). The School Feeding Program strives to provide Ghana kids with nutritional lunches. The nutritional quality of, for instance, Ghana's school feeding program is controversial; yet, its aim and objective are to give healthy free meals to pupils (MoGCSP, 2017). Studies show that school lunch programs may enhance nutritional intake and academic performance (Gelli et al., 2019). However, food quality and consistency remain, and continual monitoring and adaption are necessary to guarantee success.

2.9.2 Community-Based Interventions

These interventions focus on the community, family, and groups within the societal structure.

Family-based interventions emphasize the role of family dynamics in shaping adolescents' dietary practices (Liu et al., 2022). Programs that involve parents and caregivers in nutrition education and meal planning have shown positive outcomes (Woźniak et al., 2022). The

"Family-Based Nutrition Program" in Australia is an example where parents are educated on healthy eating and involved in family meal planning (Breda et al., 2024). Such programs in Ghana can benefit from culturally tailored approaches that consider local dietary practices and preferences (Ogum Alangea et al., 2018).

Furthermore, Community-based initiatives that involve local organizations and health workers can also be effective (Islam et al., 2019). These programs often focus on improving food access, promoting healthy eating through community events, and offering cooking demonstrations (Doustmohammadian et al., 2022). Kenya's "Community Nutrition Program" explains how community engagement can improve dietary practices (AED, 2002). In Ghana, community-based programs that address food security and nutrition education are crucial for reaching adolescents in underserved areas (Gelli et al., 2019).

Other interventions include Regulation of Food Advertising policies that regulate food advertising, particularly targeting unhealthy foods, which can influence adolescents' dietary choices (Tsochantaridou et al., 2023). As implemented in various countries, restrictions on the marketing of sugary drinks and high-fat snacks have shown potential in reducing the consumption of these products among youths (Nartey & Obilie-Mante, 2024). In Ghana, such policies could help mitigate the influence of food companies' aggressive marketing.

2.9.3 Policy-Based Interventions

Policy-based interventions are those policies enacted by policymakers to guide a state's people into achieving a specific objective (Pollack Porter et al., 2018). In the case of nutrition-based interventions, these would include policies around the labeling of foods, regulations on

ingredients, and standards set to guide packaging, advertisement, and manufacture of food-based products (World Health Organization, 2020). Implementing and enforcing food labeling and nutrition standards can guide adolescents toward healthier food choices (Pfledderer et al., 2024). Policies that require clear nutrition labeling and set standards for school foods contribute to better-informed dietary decisions (Jones et al., 2019). The "Nutrition Labeling and Education Act" in the United States exemplifies how such regulations can impact dietary habits (Codjia et al., 2024). Ghanaian policies that ensure the availability of accurate nutrition information and enforce standards for food sold in schools could be beneficial (Ministry Of Health, 2017). In Ghana, for instance, all advertisements for alcoholic beverages cannot be done by celebrities and public figures. Also, all advertisements must be approved by the Food and Drugs Authority (FDA) before they can go public (FOOD AND DRUGS AUTHORITY-GHANA, 2013).

2.10 Conclusion

This literature review provides a comprehensive examination of the current knowledge surrounding dietary practices and their associated factors among adolescents, specifically focusing on Ghana. It highlights the global, regional, and local perspectives on healthy dietary practices, emphasizing the importance of balanced nutrition during adolescence to support physical, cognitive, and emotional development. The review underscores the influence of various factors, including socioeconomic status, cultural norms, and lifestyle choices, on adolescent dietary behaviors, revealing both the challenges and opportunities for intervention. By synthesizing insights from existing research and survey data, this review aims to inform the

development of targeted strategies to improve adolescent nutrition and health outcomes in Ghana.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter describes how the research topic was explored and which design and procedures were used and why they were used. The chapter also discusses the context in which the study was conducted, the sampling technique, the data collecting instrument, the data collection protocol, the analysis, the validity, and ethical considerations in the study.

3.1 Study Design

This quantitative study adopted a cross-sectional design to analyze adolescents enrolled in the Global School-Based Student Health Survey (GSHS) dataset. The cross-sectional study design, an observational approach, allowed for the simultaneous measurement of outcomes and exposures in study participants. This design proved cost-effective and time-efficient, leveraging readily available online datasets from the GSHS.

A cross-sectional study design facilitated the comparison of differences between various groups, providing a comprehensive snapshot of dietary practices among in-school adolescents (Siviroj et al., 2024). The 2012 Ghana Junior High Global School-Based Health Survey (GSHS) targeted students in grades JHS 1-3, generally ages 13-17, utilizing a two-stage cluster sampling procedure to guarantee data reflected all these students in Ghanaian Junior High Schools (Sheet, 2012). In the first step, schools were picked based on their enrollment numbers, and in the second stage, classes within these schools were randomly selected, with all students in these

courses asked to participate. The study examined a variety of themes including alcohol and drug use, dietary habits, hygiene, mental health, physical activity, protective factors, sexual behaviors, tobacco use, and incidences of violence and accidental injury.

Students filled out computer-scannable answer sheets, achieving a 100% school response rate and an 82% response rate from students, with a total of 1,648 participants contributing to the data. The prevalence estimates, along with their 95% confidence intervals, are detailed in the survey results. The reliance on existing GSHS datasets not only streamlined the research process but also ensured a diverse and extensive subject pool for data collection.

3.2 Study Sites

The GSHS was conducted in various schools across different regions of Ghana, that captured a diverse sample of in-school adolescents from urban, rural, and peri-urban areas.

3.3 Study Population

The study population comprised of Junior and Senior High School adolescents aged 13 to 17, who were sampled for Ghana's Global School-based Student Health Survey.

3.4 Including and Exclusion Criteria

3.4.1 Inclusion Criteria

The study included Senior High School adolescents sampled for the GSHS.

3.4.2 Exclusion Criteria

Adolescents not sampled for the Global School-based Student Health Survey were excluded.

3.5 Sample Size

This study included senior high school adolescents enrolled in the GSHS. A total of 1,984 participants were sampled.

3.6 Sampling Procedure

Students in grades SHS 1-4 (Senior High), generally attended by pupils aged 13–17, competed in the 2012 Ghana GSHS. In order to generate data that was typical of every student in grades SHS 1-4 in Senior High School, the GSHS employed a two-stage cluster sampling approach. Schools were originally picked with a probability that matched the amount of enrollment. classes were randomly picked for the second stage, and every student in those classes was able to participate. Thus, the two-stage cluster sampling approach was adopted. This strategy helps to acquire a representative sample of kids across multiple schools and classes, making the data more reflective of the whole student population in the grades indicated.

3.7 Data Collection Procedure

The Global School-based Health Survey (GSHS) is a nationally representative survey conducted among in-school adolescents in over 94 low- and middle-income countries (LMICs), including Ghana, by the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC), Middle Tennessee University, Ghana Education Service (GES), and Ministry of Health. The recent Ghana survey was conducted in 2012. Data on behavioral risk and protective factors, including drug and alcohol use, dietary habits, cleanliness, mental health, physical activity, protective factors (those that do not contribute to death or morbidity), sexual behavior, tobacco use, violence, and unintentional injury, were gathered through the survey.

3.8 Data Analysis

Secondary data received from the Global School-based Student Health Survey was downloaded to Excel 2019. Data was cleansed to assure data quality and then entered into STATA 17 for statistical analysis. Categorical variables were reported as percentages whereas means and standard deviations would be utilized for continuous data. To evaluate how respondents' sociodemographic factors impacted the prevalence of healthy eating among teenagers enrolled in school, binary logistic regression would be applied. Factors related with the detected patterns would be assessed using a chi-square test at the bivariate level. Statistical significance would be defined at $p < 0.05$ for all analyses.

3.9 Ethical Considerations

The Institutional Review Board of Ensign Global College would seek ethical approval for this study. Administrative permission would be requested from the organization hosting the dataset. As the study would utilize pre-existing data without direct contact with the adolescents, informed permission and other ethical considerations already handled by the original data would not be necessary.

CHAPTER FOUR

FINDINGS

4.0 Socio demographics characteristics of respondents

Table 4.1 presents the frequency and percentage distribution of the respondents based on their age, sex, and number of close friends. The majority of the respondents (53.5%) were 18 years and above, followed by 43.6% aged 15-17 years, and only 2.9% aged 12-14 years. The respondents were almost equally distributed between males (53.7%) and females (46.3%). Most respondents had three or more close friends (31.3%), followed by one close friend (29.6%), two close friends (25.1%), and 14% had no close friends.

Table 1 ***Socio demographics characteristics of respondents***

Variables	**Frequency (1,984)**	**Percentage (%)**
Age		
12 to 14 years	57	2.9
15 to 17 years	865	43.6
18 years and Above	1062	53.5
Sex		
Male	1065	53.7
Female	919	46.3
Number close friends		
None	278	14.0
One	587	29.6

Two	498	25.1
Three or more	621	31.3

4.1 Dietary practices among respondents

The following table provides a concise overview of the dietary habits of the participants regarding their intake of fruits and vegetables throughout the previous 30 days. Significantly, 75.4% of participants said that they consume a minimum of two fruits and two vegetables on a daily basis, indicating their adoption of healthy eating habits. By comparison, 24.7% failed to achieve this criterion of nutritious food consumption. Furthermore, a significant majority of participants, namely 87.5%, said that they consume a minimum of two vegetables on a daily basis. Conversely, an only 12.5% failed to meet this standard of vegetable intake.

Table 2 ***Dietary Practices among Respondents***

Variables	**Frequency (1,984)**	**Percentage (%)**
Eat at least two fruit per day past 30 days		
Yes	1495	75.4
No	489	24.7
Eat at least two vegetables past 30 days		
Yes	1736	87.5
No	248	12.5

4.2 Overall dietary practices of respondents

Figure 3 shows the overall dietary practices of respondents enrolled in the GSHS. The majority (92.4%) had healthy dietary practices whereas (7.6%) of the respondents had unhealthy dietary practices.

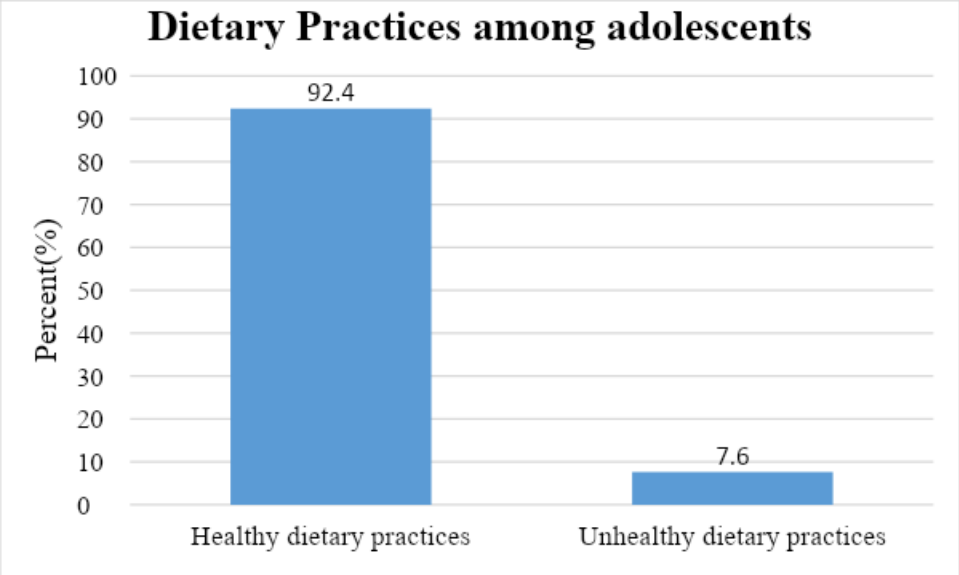

Figure 3 ***Overall dietary practices of respondents***

4.3 Lifestyle factors of adolescents enrolled in GSHS

Table 3 presents the frequency and percentage distribution of various lifestyle factors among the respondents. About 18.1% of respondents reported ever smoking cigarettes, while 81.9% had never smoked. Only 6.8% reported having people around them who smoke tobacco, while 93.2% did not. Concerning the use of tobacco, 8.8% of respondents reported that their parents use tobacco, while 91.2% reported their parents did not use tobacco. About 41% of respondents

reported ever drinking alcohol, while 59% had never drunk alcohol. Approximately 20.3% of respondents reported ever using drugs, while 79.7% had never used drugs. With regards to using amphetamines 4.3% of respondents reported ever using amphetamines, while 95.7% had never used amphetamines. With regards to ever having sex, 36.2% of respondents reported ever having sex, while 63.8% had never had sex.

About 72% of respondents reported going for physical education (PE), while 28% did not. Over 65% of respondents reported that their parents checked their homework in the past 30 days, while 34.8% reported their parents did not. About 9.3% of respondents were overweight, 2.7% were obese, and 4.9% were underweight, while the majority (90.7% and 97.3%, respectively) were not overweight or obese.

Table 3 ***Lifestyle factors of adolescents enrolled in GSHS***

Variables	**Frequency (1,984)**	**Percentage (%)**
Ever smoked Cigarette		
Yes	359	18.1
No	1625	81.9
People around me smoke tobacco		
Yes	135	6.8
No	1849	93.2
Parents use tobacco		
Yes	175	8.8
No	1809	91.2

Ever drunk alcohol		
Yes	833	41.0
No	1151	59.0
Ever used drugs		
Yes	402	20.3
No	1582	79.7
Ever used amphetamines		
Yes	86	4.3
No	1898	95.7
Ever had sex		
Yes	719	36.2
No	1265	63.8
Do you go for PE		
Yes	1428	72.0
No	556	28.0
Parents check homework past 30 days		
Yes	1293	65.2
No	691	34.8
Overweight		
Yes	184	9.3
No	1800	90.7
Obese		
Yes	54	2.7
No	1930	97.3
Underweight		
Yes	98	4.9
No	1886	95.1

4.4 Analysis of the dietary practices of adolescents enrolled in GSHS

Table 4 presents the results of an Analysis of Variance (ANOVA) model that examined the relationship between various lifestyle factors and dietary practices. The model has an R-squared value of 0.0130, which means that only 1.3% of the variation in dietary practices is explained by the lifestyle factors included in the model. The F-statistic (1.99) and its associated p-value (0.0181) indicate that at least one of the lifestyle factors in the model has a statistically significant relationship with dietary practices. Among the individual lifestyle factors, drug use (p=0.0021), amphetamine use (p=0.0282), and obesity (p=0.0093) have statistically significant associations with dietary practices.

Table 4 ***Analysis of the dietary practices of adolescents enrolled in GSHS***

		Number of obs =	**1,984**	**R-squared =**	**0.0130**
		Root MSE =	**0.263576**	**Adj R-squared=**	**0.0065**
Source	**Partial SS**	**df**	**MS**	**F**	**Prob>F**
Model	1.798418	13	0.13834	1.99	0.0181
smoking	0.00644	1	0.00644	0.09	0.7608
Other smoke tobaaco	0.106248	3	0.035416	0.51	0.6756
Parents smoke	0.000817	1	0.000817	0.01	0.9137
alcohol	0.074441	1	0.074441	1.07	0.3007
drugs	0.657393	1	0.657393	9.46	0.0021
amphetamine	0.334877	1	0.334877	4.82	0.0282
Ever had sex	1.84E-05	1	1.84E-05	0	0.987
Physical Education	0.031596	1	0.031596	0.45	0.5001

Overweight	0.023468	1	0.023468	0.34	0.5612
Obese	0.470302	1	0.470302	6.77	0.0093
underweight	0.044001	1	0.044001	0.63	0.4262
Residual	136.8609	1,970	0.069473		
Total	138.6593	1,983	0.069924		

4.5 Association between healthy dietary practices and lifestyle factors

Table 5 presents the crude odds ratios (cOR) and adjusted odds ratios (aOR) for the association between various lifestyle factors and healthy dietary practices. The only lifestyle factors that showed a statistically significant association with healthy dietary practices were not having parents check homework in the past 30 days (aOR=0.65, 95% CI: 0.48-0.91, p=0.012) and not being obese (aOR=0.39, 95% CI: 0.19-0.82, p=0.013). Respondents whose parents did not check their homework in the past 30 days had 35% lower odds of having healthy dietary practices compared to those whose parents checked their homework. Respondents who were not obese had 61% lower odds of having healthy dietary practices compared to those who were obese.

Table 5 ***Association between healthy dietary practices and lifestyle factors***

Variables	**cOR (95% CI), p-value**	**aOR (95% CI), p-value**
Age		
12 to 13 years	Ref	
14 to 16 years	1.20(0.42-3.42), 0.729	
17 to 18 years	0.99(0.35-2.82), 0.989	
Sex		
Male	Ref	
Female	1.14(0.82-1.59), 0.442	

Number close friends		
None	Ref	
One	0.65(0.39-1.10), 0.109	
Two	0.80(0.48-1.35), 0.404	
Three or more	0.83(0.50-1.37), 0.464	
Ever smoked Cigarette		
Yes	Ref	
No	0.71(0.47-1.05), 0.084	
People around me smoke tobacco		
Yes	Ref	
No	2.08(0.34-1.01), 0.053	
Parents use tobacco		
Yes	Ref	
No	0.80(0.46-1.37), 0.408	
Ever drunk alcohol		
Yes	Ref	
No	0.73(0.52-1.01), 0.059	
Ever used drugs		
Yes	Ref	
No	1.10(0.87-1.38), 0.424	
Ever used amphetamines		
Yes	Ref	
No	1.09(0.47-2.55), 0.834	
Ever had sex		
Yes	Ref	
No	0.89(0.63-1.26), 0.520	
36Do you go for PE		
Yes	Ref	
No	1.11(0.77-1.60), 0.575	
Parents check homework past 30 days		
Yes	**Ref**	**Ref**
No	**0.65(0.48-0.91), 0.012**	**0.68(0.51-0.94), 0.014**
Overweight		
Yes	Ref	
No	1.46(0.46-1.33), 0.367	
Obese		
Yes	**Ref**	**Ref**
No	**0.39(0.19-82), 0.013**	**0.36(0.17-0.80), 0.011**

Underweight	
Yes	Ref
No	0.79(0.39-1.62), 0.534

CHAPTER FIVE

DISCUSSION

5.0 Introduction

This chapter discusses the findings of the study, positioning them in light of past studies. It investigates how the results of the present investigation support or contradict those of past studies. Additionally, the results have consequences for adolescent health. The chapter is structured into four parts. The first part offers a basic review of the major discoveries. The second part presents a full examination of these results, contrasting them with earlier studies. The third part discusses the ramifications of the results, and lastly, the chapter finishes with a summary of the topic.

5.1 Overview of Significant Findings

This research intended to examine characteristics linked with eating patterns among teenagers in Ghana. It was noted that typically, virtually all (92.4%) of the teenagers maintained appropriate eating behaviors. About two-thirds (75.4%) and the majority (87.5%) of the teenagers ate two fruits and two vegetables in the prior thirty days before the study, respectively. In terms of lifestyle practices of teenagers connected with dietary practices, it was discovered that drug usage, being fat and taking amphetamine was statistically substantially associated with dietary practices. Individuals whose parents did not check their schoolwork had lesser chance of participating in appropriate eating behaviors. Lastly, teenagers who were not fat were less likely to also exercise good diets in their lifestyle.

5.2 Prevalence of Healthy Dietary Practices among Adolescents

In this study, most (92.4%) of the adolescents recruited demonstrated healthy dietary behaviors. Notably, the observed level of healthy dietary behaviors in this study is markedly higher than what has been reported in prior studies, such as the school-based, cross-sectional study conducted by Hormenu (2022) in Ghana. In that study, the prevalence of healthy dietary practices was 49.9% among 1,311 in-school adolescents. The two studies' discrepancies could be attributed to various factors, including food availability and accessibility in the participants' environment (Brown et al., 2021)). Another possible explanation for the difference in prevalence is that the participants in the current study knew about food nutrition, which influenced their food choices and consumption patterns (Galbete et al., 2017). This finding may suggest that adolescents practice healthy dietary habits that reduce their risk of obesity, overweight, and other cardiovascular diseases and improve cognitive development (Hormenu, 2022; Kulshreshtha et al., 2019).

5.3 Factors Associated with Healthy Dietary Practices and Lifestyle Factors

In this study, it was found that factors such as adolescent use of drugs were associated with engaging in unhealthy dietary practices. This finding is consistent with a qualitative study that revealed that individual-level factors such as alcohol and drug use were among several factors that influence adolescents' choice of food and food consumption, as the use of substances could lead adolescents to engage in unhealthy dietary practices, which in turn could be detrimental to their health (Nalugya et al., 2023). Adolescents may hide behind drug use in order to boost their

appetite which could lead to overeating, consuming high-calorie foods and alcoholic and sugar-sweetened beverages. Consumption of high caloric foods, alcohol, and sugar-sweetened beverages has been reported to lead to overweight and obesity, which are underlying risk factors for diabetes, hypertension, and other cardiovascular diseases (Said et al., 2023).

Furthermore, our analysis revealed that adolescents who are not obese are less likely to engage in healthy dietary practices. This observation aligns with the understanding that food choices among non-obese individuals are often influenced by various external factors, including the food environment, peer influence, media, and socioeconomic status of their parents and guardians (Facina et al., 2023). Adolescents who are not obese and have easy access to fruits and vegetables may consume these more frequently, while their obese counterparts might prioritize healthy eating due to awareness of their health condition and its consequences (Liu et al., 2022).

Nonetheless, the finding that non-obese adolescents are less inclined to adopt healthy dietary habits raises concerns. This behavior might stem from a perception among non-obese adolescents that they can afford to engage in poor dietary habits without immediate repercussions on their weight. This finding is consistent with the results of a systematic review, which indicated that obese and overweight adolescents consume significantly more energy and macronutrients and are more likely to skip daily meals compared to their normal-weight peers (Mohammadi et al., 2019). This pattern emphasizes the need for targeted nutritional education and interventions that encourage healthy eating habits among all adolescents, regardless of their weight status.

Prior studies have reported that several factors influence adolescents eating behavior (Said et al., 2023). The foods, flavors, and tastes they are exposed to early in life greatly influence their

eating behavior when they grow (De Cosmi et al., 2017). This has the potential to promote healthy or unhealthy dietary practices. Healthy eating habits contribute to adolescents' physical and mental health and well-being (Abera et al., 2020). However, psychosocial changes during adolescence (associated with a need for increased independence), environmental factors (advertising, peer pressure, spending more time away from home), and consuming greater quantities of fast foods and snacks have a combined effect on adolescents' eating patterns and food choices (Hormenu, 2022). These variables, such as family/immediate home environment, peer influence, parental unhealthy food behavior, area of residence, emotional state, and mass media exposure, impact diet intake and may raise adolescents' risk of unhealthy eating behaviors, resulting in poor nutritional health. Factors (Mahmood et al., 2021).

5.4 **Association between dietary practices and lifestyle factors**.

In the regression analysis, it was noted that non-obese teenagers exhibited a substantially reduced probability of participating in good eating behaviors ($p=0.013$). This discovery is rather paradoxical, since one would anticipate non-obese persons to have better dietary habits. Nonetheless, same tendencies have been seen in other research, indicating that variables beyond weight status, including socioeconomic and environmental effects, significantly impact food behavior (Popkin, 2006). This highlights the intricacy of diet-health correlations, especially in teens.

The research examined the impact of several lifestyle variables on the eating habits of teenagers in Ghana, using data from the 2012 Global School-Based Health Survey (GSHS). Physical exercise has become a crucial factor influencing good food habits. Adolescents who indicated

participation in regular physical exercise were more inclined to eat sufficient portions of fruits and vegetables. This corresponds with current evidence indicating a beneficial relationship between physical exercise and enhanced dietary quality. Kearney et al. (1999) observed that physically active teenagers are inclined to choose better diet options, including fruits, vegetables, and whole grains. A significant percentage of the teenagers in our research failed to achieve the necessary levels of physical activity, perhaps contributing to their inadequate food habits. This is comparable with studies from other African nations where physical inactivity is becoming more frequent among teenagers (Muthuri et al., 2014).

Alcohol intake was another important lifestyle factor inversely connected with good eating behaviors. Adolescents who used alcohol were less likely to satisfy the recommended dietary recommendations for fruits and vegetables. This is in accordance with studies that reveals a strong unfavorable association between alcohol intake and food quality (Breslow et al., 2010). The drinking of alcohol may be related with locations or social circumstances that favor unhealthy eating, as well as alcohol's recognized effects on appetite management, which may lead to inferior food choices (Yokoyama et al., 2010). These results allude to the necessity of targeting alcohol intake in efforts aiming at improving eating habits among teenagers.

Smoking was also discovered as a marker of poor eating behaviors. Adolescents who smoked were less likely to eat the required quantity of fruits and vegetables. Smoking is known to affect taste perception and reduce hunger, which may explain the choice for more energy-dense and less nutritious meals (McClure et al., 2009). Additionally, the unfavorable health behaviors linked with smoking typically extend beyond nutrition, creating part of a larger pattern of risk behaviors (Spring et al., 2003). Addressing smoking cessation in adolescence might be critical not just for decreasing the acute health concerns linked with tobacco but also for improving

nutritional outcomes.

An unexpected component of our results was the robust relationship between mental health and food choices. Adolescents who reported poor mental health were more likely to have bad eating behaviors. This association has been well reported in the literature, with research demonstrating that poor mental health is generally connected with emotional eating, worse diet quality, and a greater consumption of harmful foods (Jacka et al., 2010). Conversely, healthy dietary patterns, such as those rich in fruits, vegetables, and omega-3 fatty acids, have been proven to promote superior mental health outcomes (O'Neil et al., 2014). The bidirectional nature of this link implies that fostering greater mental health may lead to changes in food behaviors and vice versa. This underscores the necessity for integrated methods that target both mental health and food as part of comprehensive adolescent health promotion efforts.

In conclusion, the relationships between lifestyle variables and dietary choices among teenagers in Ghana mirror wider worldwide tendencies while also emphasizing context-specific problems. Physical activity, smoking, alcohol intake, and mental health are all key factors of nutritional quality. Future interventions targeted at improving adolescent health in Ghana should adopt a comprehensive approach, targeting both behavioral and emotional variables to encourage healthy eating habits. Furthermore, efforts to limit dangerous behaviors, such as smoking and alcohol use, should be matched with programs to enhance mental health and increase physical exercise, thereby establishing a whole environment for healthier living.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.0 Conclusion

This study evaluated the factors associated with eating patterns among teenagers in Ghana, offering a complete summary of major findings and putting these results within the larger framework of current research. Our data demonstrated a high prevalence of good eating habits among teenagers, with 92.4% indicating involvement in such activities. The prevalence is substantially greater than previously reported rates, showing possible changes in food habits or variances in sample features and surroundings.

Significant lifestyle factors associated with dietary practices included drug use, obesity, and parental involvement in homework checking. Notably, adolescents whose parents did not check their homework and those who were not obese were less likely to engage in healthy dietary practices. These findings suggest complex interactions between parental involvement, body weight, and dietary choices.

In line with previous research, our study confirmed that obesity is associated with a greater likelihood of adopting healthier dietary habits, possibly due to heightened health awareness. Conversely, non-obese adolescents may underestimate the importance of healthy eating, potentially leading to poor dietary habits. This underscores the need for a nuanced understanding of how weight status influences dietary behaviors.

6.1 Recommendations

Based on the findings from this study on dietary practices and associated lifestyle factors among adolescents in Ghana, several targeted recommendations are proposed to address the issues identified. These recommendations are directed at key stakeholders, including the Ministry of Health, schools, parents, and community organizations, to ensure a comprehensive approach to improving adolescent health.

6.1.1 Ministry of Health:

The Ministry of Health has a vital role in improving adolescent health. Given that a majority of teenagers currently participate in healthy eating behaviors, the Ministry's emphasis should be on enhancing existing policies and programs rather than introducing new ones. Current programs like the Good Life Campaign should be extended to guarantee constant teaching on the advantages of keeping a balanced diet, particularly the necessity of eating fruits and vegetables. To combat the relationship between bad food habits, alcohol usage, and smoking, the Ministry should establish targeted anti-substance initiatives. These messages should not only concentrate on the hazards of alcohol and tobacco use but also show how these activities adversely influence food choices and general health. Social media platforms, schools, and community outreach activities may be leveraged to deliver these ideas successfully to teenagers.

Additionally, mental health should be linked into current health programs. Addressing the relationship between poor mental health and bad food patterns would need a multi-pronged strategy, incorporating both education on nutrition and access to mental health services for teenagers.

6.1.2 Schools

Schools are crucial in molding teenage habits, including nutrition and lifestyle. Given that most teenagers are already adopting good food habits, schools should concentrate on reinforcing nutrition instruction. This may be done by incorporating comprehensive nutrition education into the curriculum. Instead of introducing new programs, schools should increase the practical parts of current nutrition courses, teaching students how to make smart food choices and encourage them to sustain these habits.

Physical activity promotion should also be encouraged. Mandatory physical education lessons should remain a priority, and after-school sports activities should be increased to encourage more children to participate. Physical exercise has been proven to correspond with healthy food patterns, making it a crucial aspect of any attempt to preserve teenage health.

6.1.3 Parental Involvement

Parents are essential in molding their children's nutritional choices. Since the research indicated that teenagers whose parents did not check their homework were less likely to participate in good eating habits, parents should be encouraged to take an active role in their children’s daily activities. This involves monitoring eating patterns and encouraging healthy food choices at home.

Parents should promote healthy eating habits by providing balanced meals that contain fruits and vegetables and restricting the availability of harmful snacks. Involving teenagers in meal

planning and preparation might help them acquire a better knowledge of nutrition. Parents should also emphasize mental health care, since emotional well-being has been connected to eating choices. Open communication and getting professional support when required will lead to improved overall outcomes for teenagers.

6.1.4 Community Organization

Community groups are well-positioned to complement the efforts of schools and families by developing conditions that support healthy living. These organizations should cooperate with the Ministry of Health and schools to conduct health fairs, cooking demonstrations, and seminars that emphasis on nutrition, physical exercise, and drug use prevention. Such treatments may reinforce the excellent dietary habits already found among youths and address lifestyle concerns like smoking and alcohol consumption.

Moreover, community organizations may play a vital role in providing safe and accessible spaces for physical activity. These facilities, whether in the form of community centers or sports fields, present teens the chance to engage in physical exercise and connect in favorable conditions. Programs given by counselors and health specialists may give additional information and support for teens, helping them make informed lifestyle choices.

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