UNIVERSITY OF CAPE COAST

FOOD INSECURITY AMONG PREGNANT ADOLESCENTS IN SHAMA DISTRICT

VIVIAN OFORIWAH ESSANDOH

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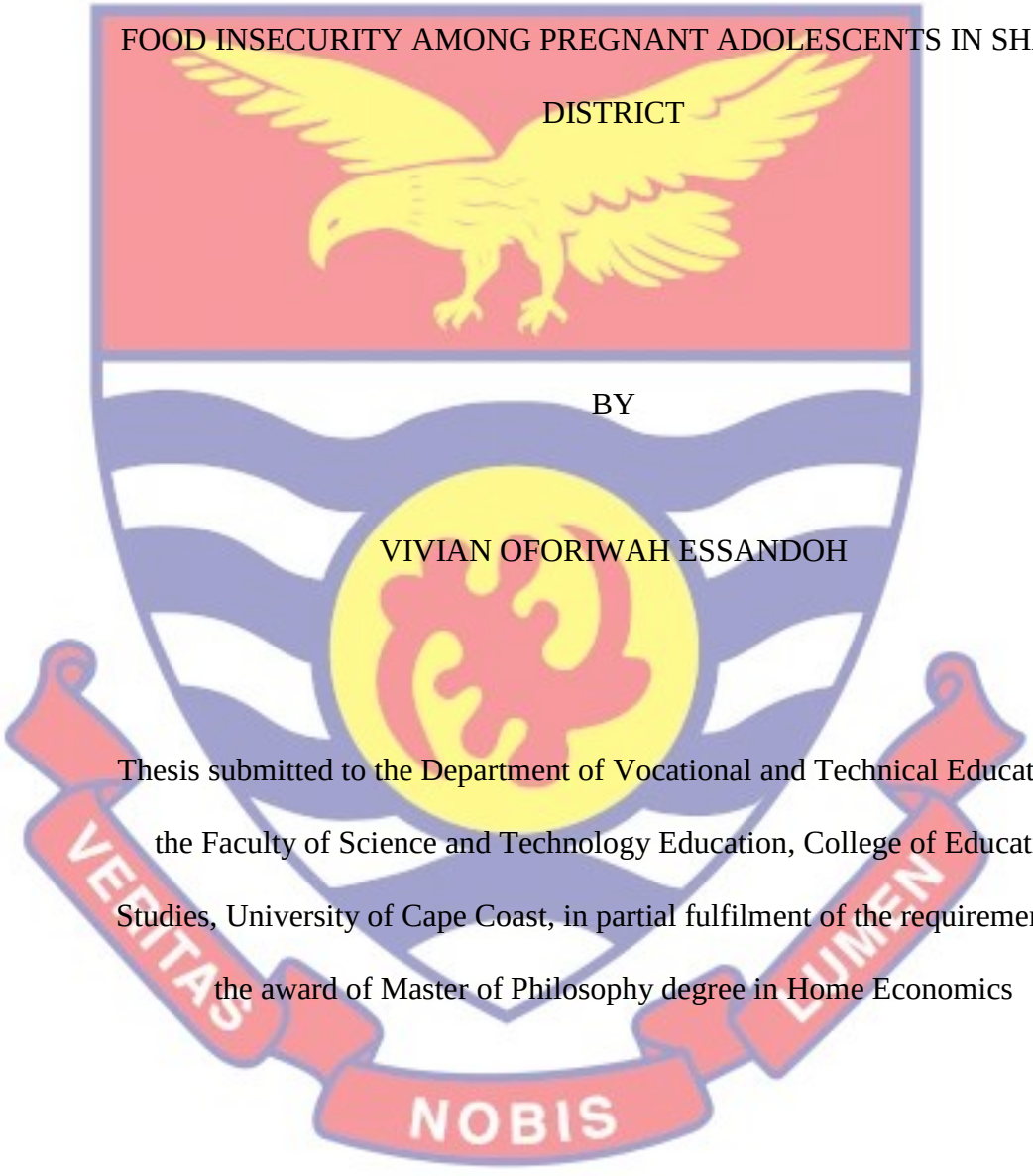

BY

VIVIAN OFORIWAH ESSANDOH

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AUGUST 2021

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature:……Date:……..

Name:…….

Supervisor's Declaration

I hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision laid down by the University of Cape Coast.

Principal Supervisor's Signature:……Date:……..

Name:…….

ABSTRACT

Food is a source of energy for humans, and insufficient availability of food affects our health of all people, most especially pregnant adolescents. The purpose of this study was to examine food insecurity status among pregnant adolescents in the Shama District. The study applied the descriptive research design, and sampled 238 pregnant adolescents using the convenient sampling technique. Respondents were required to answer a 31-item Likert-type questionnaire that assessed food insecurity status, factors affecting food insecurity and health-related quality of life. From the analyses of data, it was revealed that food insecurity among pregnant adolescents in Shama was low (Mean= 1.92, *SD*= .84). Also, it was found that the key factors affecting food insecurity among pregnant adolescents in Shama was household size (Mean= 3.02, *SD*= .53), insufficient food supply (Mean= 2.68, *SD*= .52), and unstable income (Mean= 2.66, *SD*= .52). Furthermore, it was found that food insecurity is negatively and significantly correlated with both physical (r= -.576, $p < .05$) and mental health (r= -.446, $p < .005$) dimensions of health-related quality of life. Finally, there was a significant difference in food insecurity status with respect to the economic status of pregnant adolescent [F (2, 235), 9.260, $p < .05$]. It was concluded that food insecurity among pregnant adolescents in Shama District is low. Furthermore, food insecurity has a negative impact on the health-related quality of life of pregnant adolescents. It was recommended that attention should be paid nutritional need of pregnant adolescents in Shama District.

KEY WORDS

Adolescents

Food Insecurity

Pregnant

Teenage Pregnancy

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DEDICATION

To my Family

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LIST OF ACRONYMS

APA	American Psychological Association
CSI	Coping Strategy Index
DNA	Deoxyribonucleic Acid
FAO	Food And Agriculture Organisation
FI	Food Insecurity
FNS	Food And Nutrition Security
FS	Food Secure
GSS	Ghana Statistical Service
HFIAS	Household Food Insecurity Access
HFSSM	Household Food Security Survey Module
KEEA	Komenda-Edina-Eguafo-Abrem
QOL	Quality Of Life
QOL	Quality Of Life
SES	Socioeconomic Status
TANF	Temporary Assistance For Needy Families
UNFPA	United Nations Population Fund
USDA	United States Department Of Agriculture Economic Research Service
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

Background to the Study

Food is our source of energy and insufficient availability of food in different ways affects health (Havas & Salman, 2011). In developing countries, achieving food and nutrition security (FNS) is a necessity. Yet, the greatest challenge for particularly less developed countries is to promote basic needs and well-being or make the world free from hunger, malnutrition and poverty (Seidu, 2015). According to Ghatta (2014), in achieving food stability, the world continues to face significant challenges due to its complexities. A realignment of appropriate policies is one of the main routes to achieving a resilient global food system and enhanced FNS (Pangaribowo & Gerber, 2016). The issue of food insecurity is context-specific since various combinations of interconnected and interdependent causal factors have an effect on different individuals, households, societies and countries (Pangaribowo & Gerber, 2016).

According to FAO (2000), the three main potential resources in most poor food-insecure countries are manpower, land and water productivity. As a result, when these resources are unproductive or underproductive, citizens tend to experience the negative effects of not providing the body with the right energy for the development of the nation. Food insecurity is therefore a household social and economic situation, where access to sufficient food is inadequate or uncertain (United States Department of Agriculture Economic Research Service [USDA], 2018).

Siega-Riz, Gundersen and Dole (2005) also define food insecurity as where there is a minimal or uncertain supply of nutritionally suitable and nutritious foods or the possibility to pick up socially acceptable foods. Again, the restricted access to adequate and healthy nutrients or inability to eat suitable foods in appropriate ways can cause food insecurity (Hasan-Ghami, Mirmiran, Amiri, Ashari, Sadeghian & Sarbazi, 2012). Consequently, about one billion people worldwide lack sufficient food to fulfil their nutritional needs and suffer from malnutrition and majority of these people are expectant mothers (Barrett, 2010). Abbasi, Ghoochani, Ghanian, and Kitterlin (2016) expressed that when food is unavailable for consumption due to insufficient resources, it has both physical and psychological implications. In addition, food insecurity concept encompasses the following four components: food access, food availability, food utilization, and sustainability and the denial of these rights at household, individual or community level is described as food insecurity (Abegas, 2017).

Gundersen (2013b) has classified food insecurity determinants under demographical factors and socio-economic factors. Guttas (2014) further argued that poverty, unemployment, inadequate access to education, social exclusion, poor mental health, and chronic disease have been constantly related to food insecurity; however, the most significant determinant of food insecurity is the socio-economic status of the household (Yadegari, Dolatian, Mahmoodi, Shahsavari, & Sharifi, 2017).

The American Psychological Association (APA) (2018) defines socioeconomic status (SES) as the social standing or class of an individual or group. Socioeconomic status (SES) as Oakes (2016) reports indicates one's

access to universally desired resources, whether material goods, income, power, food, networks of friendships, healthcare, leisure time, or educational opportunities. According to FAO (2010), people are considered food secure when they have ample physical, social and economic access to adequate, safe and nutritious food that satisfies their nutritional needs and preferences for an active and healthy life and having all these is linked to high socioeconomic status.

Food insecurity, particularly, in Sub-Saharan Africa, is increasingly recognized as a world health issue (Drammeh, Hamid & Rohana, 2019). It is therefore important to better understand the effects of food insecurity on feeding styles and practices among people at every stage of the life cycle. Lee, Gundersen, Laraia, and Johnson, (2012) reported increased rates of diabetes and obesity and adverse repercussions on mental health for young and medium-aging adults is due to food insecurity. Again, one major consequence of food insecurity is that it changes the pattern of eating and food diversity in a household. Seidu (2015) states that after observing the food consumption pattern of families, food insecure households mainly focus on receiving energy or getting the bellies full without satisfaction. For this reason, such families are forced to consume inexpensive foods with a high energy density. According to Richterman, Raymonville, Hossain, Millien, Joseph, Jerome, Franke, and Ivers (2020), higher prevalence of birth defects like spine palate, spina bifida, preterm, anenzephaly, etc. have been correlated with a higher severity of food insecurity. Maternal depression and decreased mental health status have also been associated with food insecurity.

Martin, Maddocks, Chen, Gilman, and Colman (2016) have also reported that women are more susceptible to food insecurity. Studies have shown that there is prevalence of mental illness among food unsecured women. Again, recent findings have shown that the life of a person would influence future generations (Weissman, 2017). Thus, the negative effect of food insecurity on physical health, such as diabetes, obesity and cardiovascular diseases, could be recorded over the centuries to increase the vulnerability of those who inherit genes from predecessors of food insecurity (Sullivan, 2013). Such intergenerational trauma is mostly prevalence among pregnant adolescents and their babies.

Adolescent pregnancy defined as pregnancy under the age of 20 years is a problem in both developed and developing countries (Ghose & John, 2017). In developing countries, the rates of teenage pregnancy are increasing and adverse maternal and perinatal results are rising (Kassa, Arowojolu, Odukogbe & Yalew, 2018). Early pregnancies among teenagers have serious health implications for teenage mothers and their children (WHO, 2020). Neal, Matthews, and Frost (2015) reported that the leading cause of death among girls aged 15-19 years worldwide is pregnancy and childbirth complications, with low- and middle-income countries responsible for 99 percent of global maternal deaths among women aged 15-49 years. Pregnancy anaemia as one of the complications is not caused by the age of people, but poor diet makes them vulnerable. Thus nutrition is one major requirement among pregnant adolescents (Ghose & John, 2017).

According to Abdirahman (2019), the quantity of nutrients taken affects the morbidity of pregnant mothers. Good nutrition will help achieve an

average increase in weight of at least 12 kg during pregnancy by 1 kg per month. It is also important to prevent anaemia which is common among pregnant mothers and teenagers. According to Khoushabi and Saraswathi (2010), sufficient nutrition before and during pregnancy has been found to support the long-term health of the mother and her child. As a result, the nutritional status of a pregnant woman has significant consequences for her health and her children's health (Abdirahman, 2019). A significant determinant of nutritional status is an individual's dietary intake, which in turn is influenced by the availability and use of food within the household (Yadegari, Dolatian, Mahmoodi, Shahsavari, & Sharifi, 2017). Therefore, determining the status of food insecurity among pregnant adolescents is important.

Statement of the Problem

Food insecurity and hunger can have adverse effects on physical, psychological, and social health of individuals (Carmichael, Yang, Herring, Abrams & Shaw, 2010). A number of detrimental childbirth outcomes, such as neural tube defects, anencephaly, and heart defects, are associated with increased stress, prolonged fasting, and micronutrient deficiency, especially in iron, foliate, and calcium during pregnancy (Carmichael et al., 2010). Females, especially adolescent, must have sufficient quantity and quality of food while pregnant for healthy foetal development. They need certain vitamins and minerals and should avoid foods that are unhealthy or unsafe (Carmichael et al., 2010). According to Rah, Christian and Shamim (2008), pregnancy is a major health and social concern during puberty, as it presents risks such as maternal morbidity and mortality, restriction of foetal development, and adverse birth effects. Malnutrition during this period can worsen the adverse

implications of teenage pregnancy. In literature, quite a number of studies have been conducted linking socio-economic status and food insecurity.

For instance, Laraia and Dole (2006) conducted a study which focused on the prevalence of food insecurity among pregnant women. Their findings reported that pregnant women especially adolescent from marginally food-secure and food-insecure households had significantly less income and education. They further reported that socioeconomic and demographic predictors for household food insecurity were income, black race, and age whiles psychosocial indicators of perceived stress, trait anxiety, and depressive symptoms, and a locus of control attributed to chance were positively associated with any household food insecurity.

Again, a study conducted by Mak (2019) where the relationship between household economic circumstances and food insecurity during pregnancy as well as the health and well-being of food-insecure pregnant women were investigated revealed that 13% of pregnant women reported experiences of food insecurity where lower household income, reliance on social assistance, renting one's dwelling and the presence of children in the household were associated with moderate-severe food insecurity. It was also identified in the findings that moderate-severe food insecurity was associated with greater adjusted odds of multiple measures of poorer mental health and that food insecurity during pregnancy is a public health problem, requiring evidence-informed policy solutions explicitly aimed to reduce food insecurity. Other authors including; Richterman et al. (2020), Siboni and Alimoradi (2018), Sani and Kemaw (2019) have reported on both the food insecurity and nutritional status of household and pregnant adolescent where their findings

suggested food insecurity among pregnant adolescent as a result of undernutrition especially in rural areas. Furthermore, especially in the findings of Sani and Kemaw (2019), it was reported that there was 43.9% food insecurity among pregnant women where pregnant women with food insecurity had the lowest score in role limitation due to physical reasons domain of quality of life respectively for mild, moderate and sever food insecurity). The results further indicated that one-unit reduction of household food security significantly decreased the total quality of life.

In the Ghanaian context, Manu, Akuamoah-Boateng and Akaba (2013) conducted a study which focused on finding out the food insecurity status of households engaged in farming activities in the Ketu district where food security scale was used. The results of the study revealed eight variables as the major predictors of food insecurity. These were age, number of children, land ownership, access to change agent, access to financial services, number of vegetables produced, amount of credit received and vegetable produce markets. Based on their findings, they advocated that change agents focus on these factors among families to improve the availability of nutritious and adequate food in households.

Since food insecurity among pregnant adolescent has been found to affect the long-term health of the mother and her child, investigating into the food insecurity status among pregnant adolescents is important since solutions would be obtained to ensure food security in order to improve their health and that of their children. In Ghana, pregnant adolescents especially those in rural communities suffer major nutritional deficiencies because of poor nutritional status due to the intake of insufficient and quality diet. However, it appears no

study has been conducted on the food insecurity status of pregnant adolescent. The Shama District is a fishing community in the Western Region of Ghana which has been identified to undergo seasonal food insecurity because of illegal fishing activities and low fish catch. This has led to poor socio-economic status of families leading to high prevalence of adolescent pregnancies. With the importance of good nutrition in improving pregnancy, delivery and birth outcome a study which sought to examine food insecurity status among pregnant adolescent in the Shama District is worthwhile.

Purpose of the Study

The purpose of the study was to examine food insecurity status among pregnant adolescent in the Shama District. The study specifically sought to:

1. determine food insecurity status of pregnant adolescents in Shama District.
2. examine the factors perceived to be contributing to food insecurity status of pregnant adolescents.
3. determine the perceived effects of food insecurity on the quality of life of pregnant adolescents.
4. determine whether there is significant difference in perceived factors contributing to food insecurity status among pregnant adolescents with different economic status/income levels.

Research Questions

The study was guided by the following questions formulated;

1. What is the food insecurity status of pregnant adolescents in Shama District?

2. What are the perceived factors contributing to food insecurity status of pregnant adolescents Shama District?
3. What are the perceived effects of food insecurity on the quality of life of pregnant adolescents in Shama District?

Hypothesis

H_0: There is no statistically significant difference in perceived factors contributing to food insecurity status among pregnant adolescents with different economic status.

Significant of the Study

The study will be very useful to policy makers because food insecurity is a major concern in global food debate. Research on food insecurity is important in order to identify areas that need food supply urgently. Also, findings from this research can help inform various household on how to strategize poverty alleviation and enhancement of food security programmes in order to get pregnant women to increase the quantity and consistency of their diet. In addition, multi-level efforts, including policy making, providing funding and providing adequate services, are required to ensure that pregnant women have access to high-quality food. The research will add up to the limited body of literature on food insecurity in the Western Region and Ghana at large.

Delimitation

The study was delimited to only pregnant adolescent. Also, the scope of the study covered pregnant adolescent within Shama District. The study also focused on variables that relate to the food insecurity status of pregnant adolescents as well their health-related quality of life.

Limitations

A major limitation of the study was the use of questionnaire which does not give in-depth description on respondents' experiences and allow for follow-ups on respondents' responses. It should be indicated that some of the items demanded further probing but the use of the quantitative methodology did not allow that Furthermore, the quantitative methodology that was used required a large sample size and due to lack of resources, the study was limited to some selected respondents (pregnant adolescent) in the Shama District in the Western Region of Ghana.

Definition of Terms

Food Insecurity: Food insecurity happens when there is a minimal or uncertain supply of nutritionally suitable and nutritious foods or the possibility to pick up socially acceptable foods

Adolescent Pregnancy: The occurrence of pregnancy in girls aged 10 to 19 (Sawyer, Azzopardi, Wickremarathne & Patton, 2018).

Coping Strategies: An individual's actions to master stressful situations by accept them, eliminate or mitigate them both behaviourally and psychologically.

Quality of Life: A person's satisfaction with their physical and mental health, life and environment.

Organisation of the Study

The study has been composed of five chapters. Chapter one involved the introduction which covers the background to the study, statement of the problem, purpose of the study as well as research questions. It also presents the significance of the study, delimitation and limitations of the study and

definition of terms. The second chapter focuses on the review of existing literature in relation to the food insecurity among pregnant adolescent and their nutritional status. Specifically, the literature has been reviewed in three main blocks namely: theoretical, conceptual and empirical review. The methodology that was used in the study also captures in the third chapter. The chapter provides a description of the research design, population, sample and sampling procedures and data collection instruments. The chapter also captures validity and reliability of the instruments, ethical considerations and field work as well as data processing and analysis. Chapter four presents the results and discussion of the study whereas the fifth chapter focuses on the summary, conclusions and recommendations from the findings. The chapter also makes suggestions for further studies.

CHAPTER TWO

LITERATURE REVIEW

The review of literature covered theoretical framework, conceptual review, conceptual framework and empirical review. The chapter therefore reviewed literature on the topic under study. The literature review of the study presented the findings, assertions, and observations of several authors on the food insecurity status among pregnant adolescent.

Theoretical framework

In developing countries, achieving food and nutrition security (FNS) is a necessity. The realignment of appropriate policies is one of the main routes to achieving a resilient global food system and enhanced FNS (Pangaribowo & Gerber, 2016). Studies have elaborated on the various approaches that can serve as the basis for forming a system which would help achieving a global food system. The Abraham Maslow's theory of need and the systematic innovation approach were the approaches proposed to solve social problem both in a linear or non-linear manner. The Abraham Maslow's theory of need and systematic innovation approach were the theoretical frameworks that underpinned the study.

Abraham Maslow's theory of need

Abraham Maslow advocated the principle of human need, often known in society as the hierarchy of needs of human world (Aruma, & Hanachor, 2017). Abraham Maslow as a renowned researcher in the study of human needs and motivation came up with his hierarchy of needs theory with a proposal that people are motivated by five levels of needs namely: (1) Physiological needs, (2) safety needs, (3) belonging needs, (4) esteem needs

that marks the beginning of the theory of motivation and stressed that two basic points should be taken into account.

b. Safety needs: while physiological needs are reasonably met, new needs are emerging which is classified as security needs (Maslow, 1943). There are needs such as danger security, trust and fear (Aruma, 2016). One aspect of your security needs is economically stable.

c. Love and affinity needs: the need for love, loyalty, and association arise once the physiological needs and safety requirements are met in full. Maslow stresses that people are social creatures at this time of philosophy (Adair, 2013). Eigeness and love requirements of the person are a number of requirements, such as feelings of belonging (commercial affiliations, clubs, churches, companies, etc.), wife, child and motherly love (Seeley, 1988).

d. Esteem Needs: there are two types of need for consideration. Firstly, those linked to a person's reputation, including rank, recognition and gratitude, must be valued and respected. The other is the need for self-respect and self-esteem, such as self -confidence, freedom, achievement and ability (Maslow, 1954, Griffin, 2013).

e. The self-actualization needs: Even though all the needs are met at the other levels of the hierarchy, the individual remains uneasy and unhappy. For this purpose, people should comply with their personal skills (McCabe, & Malefyt, 2013).

According to Tay and Diener (2011), Maslow has divided the needs into two groups: physiological, safety, love and esteem, all requirements for deficiency; most people must satisfy their lack needs before they achieve self-

fulfilment. It is important to note that Maslow's (1943, 1954) five stage model has been expanded to include cognitive and aesthetic needs (Maslow, 1970a) and later transcendence needs (Maslow, 1970b). However, Perater, Caintic, Canencia, and Evanoso (2019) expressed that Maslow found the most important physiological requirements as different needs proved helpful before those needs were met.

This theory is applicable to this study because the most important need on the hierarchy is food. Indeed, all human beings want food to be healthy and nutritious enough to consume. A world without hunger has a positive effect on the world's economy, health, education, equality and social change. Nutrition was one of the key factors for achieving sustainable development (Global Nutrition report, 2017). For individuals and their families, communities and nations, the impacts of food on growth, society, health and wellbeing have become serious and enduring. While progress has been made recently, Patrick (2014) reports that countries' food insecurity continues to evolve and expand and their solutions need effective and sustainable policy leadership. The problem of food insecurity is one barrier to the implementation of the Sustainable Development Goals in terms of nutrition (Cherry, 2010).

The systematic innovation approach

In today's world, change, whether social, economic, political, or technical, is unavoidable and widespread. Changes are often described as nonlinear and the process of change is often nonlinear and discontinuous, and occurs or is interpreted as multiple results or epiphanies (Matei & Antonie, 2014). Therefore, innovation is also viewed by many scholars as both a significant force of change and an important way of responding to change

(Jasper, 2009). Additionally, the emergence of a global economy clearly actualizes the need for new economic policies to create new ways of organizing socio-economic structures (Vasin, Gamidullaeva, & Rostovstaya, 2017) by employing specialized technological and social strategies to meet these global changes. Nevertheless, technological and social innovations of all kinds evolve under particular kind of socio-economic conditions (Vasin, Gamidullaeva, & Rostovstaya, 2017). Innovation was institutionalised as the end result of a linear process, starting with fundamental research, continuing with application research and finishing with development and diffusion (Godin, 2006) making the process of innovation systematic hence, the term 'systematic innovation'.

The term systemic innovation has been increasing in use in recent years (Midgley & Lindhult, 2017). Also, it is used to refer to new ideas (products, services and models) developed to fulfill unmet social needs (Matei & Antonie, 2014). Again, systemic innovation according to Jasper is a norm rather than the exception for many firms developing new products and services. Due to this characteristic, Suurs and Roelof (2014) expressed that it has led to fundamental changes in both social dimensions (values, regulations, attitude, etc.) and technical dimensions (infrastructure, technology, tools, production processes) and most importantly, in the relations between them. Matei and Antonie (2014) define systematic innovation as: "innovation that is explicitly for the social and public good". It is innovation inspired by the desire to meet social needs which can be neglected by traditional forms of private market provision and which have often been poorly served or unresolved by services organized by the state. Matei and Antonie (2014)

added that the emergence of new and complex multidisciplinary social, environmental and demographic problems affecting a growing number of participants has led society to become increasingly aware of the problem of systematic innovation around the world. Similarly, the aim of systemic innovation is to pursue solutions to social challenges by identifying and providing innovative programs that enhance the quality of life of individuals and community groups; identifying and introducing new labour market integration systems, new competencies, new employment and different modes of involvement (Matei & Antonie, 2014). Additionally, according to Andrew, Klein, and Mohamud (2010), in systemic innovation approach, persistence and intractability of wicked problems is seen as one of the forces of systematic innovation. The term 'wicked problem' was first coined by Rittel and Webber (1973) to describe the complex issues of social policy facing communities that cannot be definitively defined and which do not have conclusive and objective solutions. Wicked problem characteristics include: they have many causes, they have several interdependencies, various stakeholders have a different view of what the problem is and often have competing priorities, they have no straightforward solution, attempts to fix them frequently lead to unintended results and they are context-specific (Australian Public Service Commission, 2007). A solution ecosystem is all the projects which address some of the interdependent causal elements that underpin the wicked problem and all the organizations collaborating for such initiatives to address a particular wicked problem and geographical population.

Recently, however, researchers started to look at innovation even more intricately: namely, as an innovation process that becomes a vibrant, nonlinear

process (Link & Siegel, 2007) and in which information can be applied to both internal and external sources (Chesbrough, 2003a). This alerted socialists to look at these innovations in a more complex manner.

Linking systematic innovation approach to food insecurity

According to MacMillan and Dowler (2012), food insecurity is often described as a wicked problem. The problem of food insecurity has all the features of a wicked problem (Pangaribowo & Gerber, 2016). They expressed that attempts to tackle food insecurity often lead to unintended effects because of its multi-causality and interdependence. Again, the issue of food insecurity is context-specific since various combinations of interconnected and interdependent causal factors have an effect on different individuals, households, societies and countries (Pangaribowo & Gerber, 2016). The effectiveness of traditional approaches to addressing food insecurity has been challenged. It is expressed that since food insecurity is a wicked problem, the conventional approaches to addressing food insecurity are not satisfactory. The need to take an approach to systematic innovation is then articulated. It is also argued in the Final Report of the Social Innovation Europe Project (Davies, Mulgan, Norman, Pulford, Patrick, & Simon, 2012) that systemic innovation is the most suitable type of social innovation to solve wicked problems, as systemic reform is needed for wicked problems. Food insecurity is a wicked problem and needs to be tackled holistically by aligning the features of food insecurity with the features of wicked problems and showing how an authoring tool can be used to tackle food insecurity by increasing consistency and building the adaptive capacity of ecosystems to solve food insecurity. The ecosystem solution for food insecurity will consist of all

initiatives in a geographical community that addresses all of the causal factors of food insecurity and the organizations working on those initiatives (Zivkovic, 2017).

Food insecurity is seen as a major problem among individuals, households, and communities because of its multiple causal factors and how complex it looks. For example; According to Mentan (2014), different stakeholders in food insecurity have a different view of what the food insecurity issue is and hence have contradictory objectives. For instance: some argue that the current levels of production will meet the world's future food needs while others argue that they cannot; some stakeholders argue that there is enough food in the world and the problem is distribution; there are stakeholders who argue that national food security is what is important while others agree that this is no longer important because of global trade. Also, Eakin, Bohle, Izac, Reenberg, Gregory, and Pereira (2010) expressed that in the various views of the market-driven, environmental, and human rights viewpoints of food insecurity, another example of the varied understandings of food insecurity can be seen: market-driven approaches regard food as a product, the global debate on environmental change considers food as an ecosystem service and the viewpoint of human rights considers food as a fundamental need. Food insecurity has no straightforward solution, considering these diverse understandings of the problem and their contradictory objectives (Zivkovic, 2017).

This approach was employed in this study since it provides the avenue to determine the status, causes and effect of food insecurity as in this context. Understanding the state causes and effects of food insecurity form the basis for

intervention. Food insecurity is a major problem among individual's especially pregnant adolescents, households and communities at large and the causes varies (Rani et al., 2018). The status, causes, effects and influence of food insecurity are discussed in this chapter to grasp a better understanding of the concept.

Conceptual Review

Food insecurity

Food is our source of energy and insufficient availability of food in different ways affects health (Havas & Salman 2011). Worldwide, food insecurity remains a major challenge (Food and Agriculture Organization of the United Nations, 2014). Yet, over time, the concept of food insecurity has advanced (Seidu, 2015). Food insecurity is more broadly defined by the Food and Agriculture Organization of the United nations as where all people do not have access at all times to enough, safer and nutritious food that suits their diets and desires for active and healthy lives; physically, socially and economically (FAO as cited in Mak, 2019). However, according to Havas and Salman (2011), this description includes many requirements: food availability, food access, and the cultural appropriateness of food. Nevertheless, some countries across the globe find it difficult to have access to nutritiously appropriate food (World Health Organization, 2018). This was actually confirmed in a report by Laraia, Siega-Riz, Gundersen, and Dole, (2005) that in 2003, there was food poverty in about 11.2 percent of all-American households representing 36 million people. According to FOA (2000), the two main potential resources in most poor food-insecure countries are manpower and land and water productivity. When these resources are unproductive or

underproductive, citizens tend to experience the negative effects of not providing the body with the right energy for the development of the nation. Food insecurity is a household social and economic situation where access to sufficient food is inadequate or uncertain (United States Department of Agriculture Economic Research Service [USDA], 2018).

Additionally, according to FAO (2014), restricted access to adequate and safe nutrients or failure to eat suitable food can contribute to food insecurity. Mak (2019) expressed that food insecurity involves a number of interactions starting with anxiety about possible food insufficiency, qualitative sacrifices in food choice, and quantitative compromises such as foregoing meals due to lack of money in its most serious cases. Anderson as cited in Laraia, Siega-Riz, Gundersen, and Dole (2005) define food insecurity as where there is a minimal or uncertain supply of nutritionally suitable and nutritious foods or the possibility to pick up socially acceptable foods. This indicates that there is a clear gap between what the body needs to function well, what is socially accepted and what we actually get access to.

About one billion people worldwide lack sufficient food to fulfil their nutritional needs and suffer from malnutrition (Barrett, 2010) and majority of these people are expectant mothers. Food and nutrition are vital to promote healthy pregnancy and preterm birth and low birth weight reasons of infant death and morbidity. Women ought to have ample food quantity and quality during pregnancy (Grilo, Earnshaw, Lewis, Jessica, Emily, Tobin, & Ickovics, 2015) to avoid complications. Food insecurity is therefore described by the FAO (2014) as a limited or uncertain nutritionally adequate food availability that prohibits women from complying with healthy eating guidelines during

pregnancy. Drewnowski, as cited in Grilo et al. (2015) has related food insecurity to low food consumption and reduced nutritional status among women. Mason (2001) opines that in order to take steps to address food insecurity in most cases, the word hunger has also been used. Hunger is not inherently caused by food insecurity, but hunger is a potential consequence of food insecurity (HealthyPeople.gov, 2014). Abbasi, Ghoochani, Ghanian, and Kitterlin (2016) expressed that when food is unavailable for consumption due to insufficient resources, the most common type of food insecurity occurs and thus results in the physical and psychological results of hunger. Gattas (2014) reported that a clear picture of relationships between different variables, including the determinants and the effects of food insecurity, is required to establish efficient and targeted initiatives to address food insecurity.

On the other hand, food insecurity concept encompasses the following four components: food access, food availability, food utilization, and sustainability (Gregory & Ilgram as cited in Abegas, 2017). Access to food is assured when households and everyone has sufficient resources to provide adequate food for a balanced diet (Abegas, 2017). Lara, Ovando, and Ruiz (2017) also defined access as it refers to physical and economic proximity of the food. Abegas described food availability as to be achieved if enough food quantities for all people within a country are regularly available. Similarly, Lara, Ovando, and Ruiz (2017) explain availability to stand for the physical disposition of the food and is determined by the level of food production, reserve and trade. Food utilization refers food usage through proper diet, clean water, hygiene and health care to ensure a state of nutritional well-being that satisfies all physiological needs (FOA, 2006). Lara, Ovando, and Ruiz (2017)

also explains utilization as the biological way in which the body makes the most of the nutrients, food processing, diet and distribution by members of the family According to the FAO (2008b), food sustainability means that the above three food safety components are met at any time. It connects the permanency of the three previous dimensions along the process, which implies continuous availability, access and utilization (FAO, 2016).

The above components constitute the food insecurity status of any household. Therefore, the denial of these rights at household, individual or community level is described as food insecurity (Abegas, 2017). The FAO (2016) suggests that food insecurity is the inability to obtain a sufficient quantity of inexpensive nutritious food. Over time however, efforts have been made to revise this definition to bring maximum food safety visibility. Experts considered the need, from a macro paradigm which concerns national and international governments and communities, to a new micro-social dimension with room for individual choice in this fundamental social unit (Lara, Ovando, & Ruiz, 2017). In addition, it converges the complex relation and interdependence among the members of domestic social unit and the community it is part of, also the nation and the international context (Maxwell, 2016). Based on the above, tackling food insecurity means that food should always remain available and accessible to all individuals throughout the life course (Drammeh, et al. 2019).

Causes of food insecurity

According to FAO (2016), there are several factors that contribute to food insecurity. The key causes that have aggravated the problem of food production, distribution, and access are drought and violence. Within an

already tough setting of fragile ecosystems, high rates of population increase and poverty have also played a role. Because about 80% of the population in the region lives in rural areas and relies almost entirely on agriculture for food and income, solutions to poverty and food insecurity must be found primarily in the agricultural sector.

The Horn of Africa provides the world's most challenging task in reaching the UN Secretary-Millennium General's Goal of halving the proportion of people living in severe poverty by 2015, as stated in the UN Secretary-Millennium General's Report. In the Rome Declaration and Plan of Action, adopted at the FAO World Food Summit in 1996, world leaders pledged to halving the number of hungry and undernourished people in the world by 2015. More than half of the inhabitants in the region now live on less than $1 per person per day, according to estimates. Different poverty levels have been established in each country, reflecting the financial means required to acquire a meal that meets the minimum tolerable energy requirements, but the general picture is one of widespread and deep deprivation.

It is crucial to understand the link between poverty and food insecurity. Food production is important since agriculture is the main source of livelihood for the majority of the poor, and agriculture employs 76 percent of the IGAD population. However, the level of food insecurity can only be lowered if poverty can be relieved or reduced. As a result, the long-term solution to food insecurity entails more than just increasing food production; it also necessitates addressing rural livelihoods in general. Social safety nets of various kinds are also a part of the answer to absolute poverty and food insecurity, not just in exceptional conditions like drought, but also over the

lengthy periods of time required to arrive at socially inclusive and durable solutions.

In conclusion, food insecurity is a major concern in most household in Ghana, Africa, and the world at large. Food security encompasses access, availability, utilization and sustainability of food. This component determines whether a household is food insecure or not. Over millions of households cannot get access to nutritious diets at the right time. Most people especially expectant mothers face the high risk of food insecurity which in turn affects their health and their unborn child. Household and the government must put measures in place to make food accessible to all.

Measure of food insecurity status

There are five standard methods used to measure food insecurity: i) the Food and Agriculture Organization (FAO) method ii) household income and expenditure surveys; iii) individual's dietary intake; iv) anthropometry; and v) experience-based food insecurity measurement scales (Perez-Escamilla & Segall-Correa, 2008).

The FAO method: Using Food Balance Sheets and energy consumption variance data from household income and expenditure surveys, this approach estimates calories per capita at the country level. According to Perez-Escamilla, and Segall-Correa, the main advantages of this method are that: (i) almost all countries generate the data needed and estimate their daily per capita caloric availability; (ii) estimates are frequently updated thus allowing the national, regional, and global food insecurity trends across time to be examined and compared; (iii) the method is inexpensive. They expressed that this method has disadvantages. Some of these restrictions include: (i)

dietary quality isn't taken into consideration; (ii) the national normal per capita caloric intake does not permit for understanding the intra-country caloric dispersion as a function of family characteristics; (iii) strategy accept that caloric utilization over least caloric threshold demonstrates food security, when in reality obesity has become an issue among the poor with intemperate caloric consumption being related with mild to moderate levels of food insecurity4; (iv) high degree of measurement blunder in numerator (balance sheets provide data on the amount of calories accessible but not fundamentally consumed).

Household income and expenditure surveys: This approach is focused on interviewing household respondents. Information is given by respondents on the amount of money they spend on food and other necessities. Perez-Escamilla, and Segall-Correa state that in order to use these method, these inputs are required to be able to require full advantage of this strategy: (i) amount of food bought (or used) and costs related with distinctive food expended inside and outside the house; (ii) foods gotten by any family member as either a gift or as installment for work, goods or services; (iii) foods cultivated for utilization by family individuals. This strategy gauges calories devoured on average per family member per day, making it vital to have access to socially suitable and substantial food composition tables.

There are a few points of interest related with this strategy: (i) it permits for the recognizable proof of households at chance of food insecurity, hence in expansion to mapping from the local to the national level, the determinants and effects of food insecurity can be inspected (Perez-Escamilla, and Segall-Correa, 2008).

On the contrary, this strategy has the following restrictions: i) it measures the sum of food accessible but not essentially the sum of food consumed within the time allotment of interest, for case, it is very difficult to measure the amount of food squandered, consumed by visitors or bolstered to family animals; (ii) it is difficult to assess the amount of food consumed outside the family as many individuals can report how much they spend but have a difficult time detailing precisely the foods expended outside the family; given the frequent utilization by the lion's share of the world's populace of numerous distinctive sorts of street foods and fast foods, accurately reviewing this data is without a doubt an overwhelming task.

Individual's dietary intake: This can be measured through different methods including: (i) 24-hour recall; (ii) food frequency questionnaires; (iii) food records kept by individuals or by an observer. All dietary intake methods need to make use of a reference time frame.

In relationship to the past strategies talked about, dietary intake evaluation has some one of a kind, as well as common, advantages: (i) it measures food consumption specifically and not only food availability; (ii) it addresses both dietary quality (macro and micronutrients) and caloric impalpable at the individual level; (iii) it permits for mapping from the local to the national level, and the determinants and consequences of food insecurity at the individual level can be examined; this is often imperative for understanding, for example, intra-household food consumption patterns and how it is impacted by gender (Perez-Escamilla & Segall-Correa).

Also, the first major disadvantage of the 24-hour recall and other dietary intake methods according to them is a very high level of measurement

error since respondents have to recall whatever they have eaten in the past 24 hours. This can cause errors in the assessment. Also, the cost of applying 24-hour recalls in national survey is high. Lastly, the nutrient and phytochemical food composition data is usually based on a few samples of each food product and does not take into account the bioavailability of the nutrients in the foods.

Anthropometry: The measurement of height, weight, body proportions and eventually the composition of the human body is known as anthropometry. Anthropometric indicators measure the impact of both food insecurity and health status on the nutritional status of individuals (Perez-Escamilla & Segall-Correa). Measurements of weight and height according to them are highly standardized and highly reproducible across anthropometric individuals and settings. Moreover, the cost of doing the measurements is relatively low, making it a very common technique in worldwide national surveys. In contrast to the cut-off points for evaluating the adequacy of nutrient intake, the cut-off points used to interpret anthropometric measures are relatively stronger on the basis of their proof. Anthropometry also makes it possible to map nutritional protection from local to national levels and to consider patterns, determinants and effects of malnutrition at the person level.

When using anthropometric metrics as proxies for food insecurity, there are two key constraints (Perez-Escamilla & Segall-Correa). Firstly, since they calculate the nutritional status resulting from the relationship between food (in)security and health status, these metrics are an indirect estimate of food insecurity. Second, it is difficult to understand the relationship between food insecurity and obesity, since there is increasing evidence that while extreme food insecurity contributes to waste, mild to moderate food insecurity

may lead to obesity. Individuals in this category of food insecurity can depend heavily on cheap foods with low nutrient density and high energy (Perez-Escamilla & Segall-Correa).

Food insecurity experience-based measurement scales: Fortunately, substantial advances in the fundamental measurement of household food insecurity have been made over the past two decades using scales centred on the understanding or experience recorded by the affected person. According to Perez-Escamilla, and Segall-Correa (2008), the only methodology focused on experience-based food insecurity assessment scales is a basic or direct indicator of food insecurity. Whereas the FAO method concentrates on food insecurity risk at the national level, the remaining methods discussed concentrate on assessing the risk at the individual or household level. The use of experience-based food insecurity measurement scales is very promising and can greatly complement the information provided by the other food security assessment methods.

Over the past 25 years, the measurement of income-related household food insecurity in Canada's national surveys has differed (Mak, 2015). The first survey measuring food insecurity in Canada explored experiences of severe food insecurity in children on the 1994 National Longitudinal Survey of Children and Youth (National Longitudinal Survey of Children, 2007). This inquiry explored the most intense prevalence of food insecurity among adolescents, namely hunger.

Since 2004, Statistics Canada has monitored household food insecurity on the national level using the Household Food Security Survey Module (HFSSM), which measures “uncertainty and insufficiency of food availability

and access that are limited by resource constraints, and the worry or anxiety and hunger that may result from it" (The Household Food Security Survey Module [HFSSM], 2012). The use of such a household metric has stayed consistent since it enables the tracking of changes over time and the opportunity to merge sub-population samples for a more comprehensive analysis (Mak, 2015).

The HFSSM was developed by the United States Department of Agriculture and it consists of 18 self-reported questions about the experience of food insecurity in a household among adults and children over the past 12 months (Bickel, 2010). HFSSM questions relate to the nature and frequency of a number of interactions linked to inadequate access to food in households (Mak, 2015). Using responses from the HFSSM, Health Canada categorizes households into three categories: i) food-secure, ii) moderately food-insecure and iii) severely food-insecure (Health Canada, 2004). Summary of the categories of household is provided in Table 1.

Table 1: Categories of Household Food Security

Status	Interpretation	10-item adult scale	8-item child scale
Food-Secure	No or one indication of difficulty with income-related food access	0 or 1 item on either scale	
Moderate food insecurity	Compromise in quality and/or quantity of food consumed	2 to 5 positive responses	2 to 4 positive response
Severe food insecurity	Indication of reduced food intake or disrupted eating patterns	6 or more positive responses	5 or more positive response

Source: Household food security status as defined by Health Canada (2004)

However, The USDA classifies household food insecurity differently than Health Canada. Most notably, categorization of a household as food-insecure begins at a higher threshold, with 3 or more responses to the HFSSM considered food-insecure. Studies studying the health and well-being of people living in marginally food-insecure households from infancy to adulthood have reported poorer physical and mental health than those in completely food-secure and moderately food-insecure households (Tarasuk, Mitchell, McLaren, & McIntyre, 2013).

Determinants of food insecurity

The variables that decide food insecurity have been well explored at global, national, regional, sub-regional, provincial, district, village, household and individual levels (silvestri, Sabine, & Patti, 2015). Different types of factors are used in the macro (national) level assessment of food insecurity, including national food supply and consumption patterns that measure total food energy availability against population energy needs (Jones, Ngure, Pelto & Young, 2012). Determinants of food insecurity make it easier for interventions on reducing food insecurity to target pregnant teenagers who are at higher risk of experiencing food insecurity (Seidu, Ahinkorah & Agbablo, 2020). Food insecurity at the household level is related to several factors, including poverty, low income, level of education, household size, employment status, age, the type of household head (gender) and food price (Drammeh, Hamid, & Rrohana, 2019). According to Drammeh et al. (2019), identifying the determinants of food insecurity involves exploring the factors that lead to the key characteristics of food security. The determinants for both food availability/access: the two commonly studied aspects of food insecurity

in the household must be examined. They designed a conceptual model which vividly explains the determinants of food insecurity of a household. The household food insecurity conceptual model incorporates the three components of household food insecurity and the factors that dictate each of them. The determinants of the availability aspect of household food insecurity have been described as factors such as production, education, household head's age, commerce and food supports. Income and its distribution within the household, the household size, food prices and employment status are identified as the determinants of the access component.

Dietary intake, dietary safety, gender and hygiene are considered as determinants of the utilization component. Diskin as cited in Kumunto (2013) points out that conventional wisdom among many food protection policymakers who have found that a high degree of association exists between food availability and access, food access and consumption, and food consumption and nutritional status. In other words, increased food availability leads to increased access, which leads to increased consumption, which in turn leads to increased nutritional well-being. In general, it can be said that the elements of food insecurity include availability, access, and utilization. The presence of each element is necessary, but not sufficient for food security (Kazemi, Masoumi, Shayan, & Yasaghi, 2020). Availability is related to the production, import, distribution, and exchange of food in the community. Access is based on factors such as family income and purchasing power, and utilization is dependent on the adequacy and health of the food, preparation, processing, and cooking of food, the nutritional attitudes of family members about food selection, and personal health (Barrett, 2010).

According to Gundersen (2013), the level of food insecurity is often strong with many negative health impacts associated with food insecurity. He added that food insecurity is a function of economic factors, and demographic factors. Havas and Salman (2011) also expressed that there is hunger in every country of the world, mostly along economic and social lines. Gundersen classified food insecurity determinants under demographical factors and socio-economic factors. Household food security is affected by myriad demographic and contextual factors, including socio-economic status, ethnicity, age, education, head of household, job loss, no fixed job, no savings, single-parent households, increased size of household, age composition of family members, children under 18 years of age in the family, monthly household income, residential home ownership status, chronic illness of family members, and smoking habit of a family member (Alimoradi, 2015).

But, the most significant determinant of food insecurity is the socio-economic status of the household (Yadegari, Dolatian, Mahmoodi, Shahsavari, & Sharifi, 2017). Also, few of the multiple factors highlighted in the article by Dremmeh, et al. (2019) concluded that the gender of the household head; age, educational status, household size, income, poverty and food price are the main determinants that affect the status of household food security and lead to child malnutrition in Sub-Saharan Africa. In relation to income and support Gross, Mendelsohn, Arana, and Messito (2019) reported that pregnancy increased its susceptibility to food insecurity in that adolescents encountered difficulties in pregnancy due to financial constraints, physical limitations and health complication attributable to frequent medical visits hence are not able to meet their nutritional needs for a healthy living. They also added that access

to public support can reduce the ability to buy healthy food thereby exposing expectant mothers to food insecurity.

Lastly, Guttas (2014) reported in his write up that even though the more comprehensive systemic determinants of food insecurity (social, economic and agricultural policy) have not been established by experience-based interventions, they have been related to poverty, unemployment, inadequate access to education, social exclusion, poor mental health, and chronic disease.

Socioeconomic status

The American Psychological Association (APA) defines socioeconomic status (SES) as "the social standing or class of an individual or group" (APA 2018). According to Bofah and Hannula (2017), SES has been widely used as a latent variable for family history measurement. Socioeconomic status (SES) as Oakes (2016) reports indicates one's access to universally desired resources, whether material goods, income, power, food, networks of friendships, healthcare, leisure time, or educational opportunities. He added that SES matters because for as long as social groups existed, it was connected to health and life performance. In particular, food insecurity (FI) has emerged as a key element of economic insecurity linked to high sexual activity that compromises economic empowerment (McCoy, Ralph, Njanu, Msolla & Padian, 2014).

According to FAO, (2010), people are considered food secure when they have ample physical, social and economic access to adequate, safe and nutritious food that satisfies their nutritional needs and preferences for an active and healthy life and having all these is linked to high socioeconomic

status. Additionally, FI and socio-economic status (SES) are thus hypothesized to be overlapping yet in unique terms, one not inherently suggesting the other (McCoy, Ralph, Njanu, Msolla & Padian, 2014). Indeed, in some studies, after adjustment for SES, the impact of FI on sexual risk behavior arises. In addition, a 2012 World Food Program study highlighted that economic development does not inherently translate into improved access to household food, and even though the poor may have additional income, it is not often used to buy more food or more nutrient-dense food. Furthermore, Kharisma and Abe (2020) reported that the combination of rapid economic growth and urbanization, consumer reliance on food purchases, the disposal of a large portion of food income and numerous dietary requirements increases the susceptibility of urban households to food insecurity.

In Ghana, among the regions of greatest concern, which include Upper East, Upper West, Northern, Brong Ahafo, and Volta, 16 percent of households are considered food insecure (Doku & Neupane, 2015). Food insecurity is linked to households' inability to produce enough staples to meet their food needs due to poor soil quality, unfavourable weather conditions, limited access to inputs, and limited financial resources to expand production (World Food Programme 2016a). The trend in Ghana is consistent with other African countries that have experienced rapid economic growth; this led to changes in lifestyle including a rise in processed food intake. Overweight/obesity rates are higher among those with higher socio-economic status; older urban women in Ghana (40–44 years of age) are of particular concern (Doku & Neupane, 2015).

In conclusion, the major determinants of food insecurity in a household are social, economic and demographic factors. These factors include age of the household head, gender, academic status, income, poverty, ethnicity, family size and disability. The socioeconomic status of an individual determines whether he/she will be able to afford a quality food. This has made socioeconomic status the major determinant of food insecurity.

Consequences of food insecurity among pregnant women

Food insecurity, in particular in the Sub-Saharan Africa, is increasingly recognized as a world health issue (Drammeh, Hamid & Rohana, 2019). According to Gross, Mendelsohn, Arana, Messito (2019), to create more concrete guidelines to help families cope, to strengthen measures for low income communities and to enlighten on food insecurity, it is important to better understand the effect of food insecurity on feeding styles and practice. They further added that pregnancy, early life and adolescence in families are vulnerable to food insecurity. A report by Lee, Gundersen, Laraia, and Johnson, (2012) indicated that the increased rates of diabetes and obesity and adverse repercussions on mental health for young and medium-aging adults have been linked to food insecurity.

1. **Changes in diet**: One major consequence of food insecurity is that it changes the pattern of eating and food diversity in a household. Seidu (2015) reported that after observing the food consumption pattern of a family, he stated that food insecure households mainly focus on receiving energy or getting the bellies full without satisfaction. For this reason, such families are forced to consume inexpensive foods with a high energy density, but a low value in terms of micronutrients, diets

that are poor in vital nutrients and vitamins, and food patterns with a low health level (Moafi, Kazemi, Siboni & Alimoradi, 2018). Therefore, as the first consequence of insufficient access to food resources, diversity of foods is reduced in such families.

2. **Birth outcomes**: Mak (2015) reported that, in one case-control analysis, associations between insecurity of the food of the mother and birth defects have been assessed in California. This shows how birth outcome is one way or the other dependent on the dietary intake of the expectant mother. From the report, a higher prevalence of birth defects like spine palate, spina bifida, preterm, anenzephaly, etc. was correlated with a higher severity of food insecurity. Moreover, Richterman, Raymonville, Hossain, Millien, Joseph, Jerome, Franke, and Ivers (2020) buttressed the fact that food insecurity is a risk factor for a preterm birth (delivery before 37 weeks gestational age). Consequently, about 15 million preterm babies are born around the world (World Health Organization, 2015) and about 20 million are born with low birth weight (Diddana, 2015) due to food insecurity. Again, studies indicate that increased risk of low birth weight, some birth defects, overweight gain, gestational diabetes and other complications of embryo are related to food insecurity (Laraia, Siega-Riz & Gundersen, 2010).
3. **Mental health**: Maternal depression and decreased mental health status have been associated with food insecurity. Longitudinal studies have shown how food insecurity has a lasting effect on Canadian adolescent mental wellbeing (Mak, 2015). According to McIntyre,

Wu, Kwok, and Patten (2017), using data from the Canadian National Longitudinal Study, children and young people with ever-serious food insecurity are more likely to experience both depression and adolescent suicide. Women tend to experience mental health issues as compared to men in terms of food insecurity. This was confirmed in a report by Martin, Maddocks, Chen, Gilman, and Colman (2016) which expressed that women are more prominent in relation to food insecurity: studies show that the prevalence of mental illness among secure women and insecure women are more prominent in relation to food insecurity: studies show that the prevalence of mental illness among secure women and insecure.

4. **Intergenerational Trauma:** Recent findings have shown that the life of a person would influence future generations (Weissman, 2017). Epigenetics is the study of heritable gene function changes not affecting the DNA sequence but nevertheless transmitted to at least one generation (Hughes, 2014) which demonstrates that food insecurity can affect more than the mental and physical health of a person. The negative effect of food insecurity on physical health, such as diabetes, obesity and cardiovascular diseases, could in fact be recorded over the centuries to increase the vulnerability of those who inherit genes from predecessors of food insecurity (Sullivan, 2013). Intergenerational trauma associated with food insecurity is of particular significance for marginalised groups, such as Americans and African Americans, since they have suffered severe trauma, including traumatic behavior such as genocide, slavery and deculturalization (Curran et al., 2005). The

dramatic increase in dietary intake, including elevated risk of cardiovascular disease, has reportedly been profound in intergenerational well-being and the world record of obesity among Native Americans (Ogden, Carroll & Kit 2014).

There is currently no research on the direct epigenetic effects of food insecurity on intergenerational physical and mental health in African America (Weissman, 2017). African Americ ans, however, have a high rate of obesity, one of the most common results of food insecurity (Wetter & Hodge, 2016). Accumulation of African Americans in food-insecure environments after generation could therefore directly influence their propensity to inherit a trait that raises the risk of inherited obesity (Dong et al., 2005).

The conduct of human eating is based on both biological and cultural factors. Both beliefs and food taboos also affect the consumption of food during pregnancy. Perceptions and food taboos are also impacted by traditions passed down from generation to generation (Obayalo, 2012).

Coping Strategies to Food Insecurity Situations

Coping, according to Skinner and Zimmer-Gembeck (2016) is a fundamental adaptation and survival mechanism explains how people identify, evaluate, contend with, and benefit from traumatic experiences. Taylor (2017) in a report explained Coping Strategies as individual actions of an individual to master stressful situations, accept them, eliminate or mitigate them both behavioural and psychological. She further stated the two general coping strategies that have been distinguished: problem-solving strategies are attempts to systematically fix stressful situations, whereas emotion-focused

coping strategies involve efforts to regulate the emotional consequences of stressful or potentially stressful events.

Socio-economic and demographic factors that have led to food insecurity among households has forced many homes and individuals especially pregnant adolescents into coping strategies in order to survive. Coping strategies are employed due to vulnerability that results from the lack of a reliable access to food (Seidu, 2015). Saaka, Oledele, Larbi and Hoeschle-Zeledon, (2017) expressed that the coping strategies adopted by households to minimize the impact of food insecurity included borrowing food or relying on help from friends and relatives, relying on less expensive foods, limiting portion size of meals and reducing numbers of meals eaten in a day. Chilton (2013) also confirmed in a report said that social networks can relief families from food insecurity, including sending a child to a neighbour's house for dinner, relying on a grandparent, living with other people, or sharing resources (including Food Stamps) to feed the family.

Sani and Kemaw (2019) reported that almost 50% of the households were food insecure and to cope up with food shortage and insecurity, household opted for reduction in number and size of meal served (decline in food quantity), working as daily labourer, selling charcoal and firewood, gathering of wild fruit and petty trade were opted as top six coping mechanism. There are studies that examine coping strategies at the household level such as short-term change in dietary pattern, reduction in quantity and quality of food, increased use of credit, sale of assets such as livestock and land etc (Shakeel & Shazli, 2020).

Similarly, Kisi, Tamiru, Teshome, Tamiru, and Tolu (2018) stated that household food insecurity is associated with having households headed by uneducated, widowed and guard household heads and having large family size. They further explained that food insecure households used both consumption and asset-based coping strategies such as eating less preferred, lower quality or less expensive foods and receiving donation from relatives or friends to cope with food insecurity. It was the suggested that Government policies should consider revising the current social protection scheme for citizens from low-income households.

Cordero-Ahiman, Santellano-Estrada, and Garrido (2017) also reported that households use various strategies to address the problem of access to food, including, eating cheaper food, limiting portion sizes at meals and reducing meals for whole days, among others. In addition, they explained that households that are vulnerable to shocks such as poverty and food insecurity may develop different temporary or permanent measures or defence mechanisms in order to survive in the absence of food and economic resources. These mechanisms are considered as strategies for coping with food insecurity that can go from dietary changes to permanent migration.

Researchers over the last two decades have unveiled several methods families use to combat food insecurity and to avoid the influence of food insecurity on their children (Chilton, Rabinowich, Breen, & Mouzon, 2018). However, they stated that the majority of studies examining coping strategies have used qualitative methods and have taken into account other correlations and effects of food insecurity. In addition, only a few studies have highlighted coping strategies in relation to the level of food insecurity

reported. Table 2 shows the types of coping strategies that families have reported in a variety of research studies (Chilton, Rabinowich, Breen, & Mouzon, 2018). There are multiple techniques in each group that can be seen as adaptive or maladaptive. Overall, the greater the severity of food insecurity, the riskier the coping strategy families utilize.

Table 2: Types of Coping Strategies

Coping Strategy Type	Strategy
	Appraisal
	a. Comparing self to others who are worse off (i.e., those begging on the streets). b. Saying not hungry / reducing appetite / blaming not eating on stress. c. Acceptance Minimizing importance of food insecurity
	Problem-focused
Nutrition and Food Related	a. Using coupons and sales / Shopping at different stores b. Getting food assistance c. Changing quality of diet d. Hunting e. Gardening f. Reducing amount of food eaten g. Adults reducing food to allow children to eat h. Cutting meals i. Using a food bank/soup kitchen j. Volunteering at a food bank/ taking leftovers from work k. Eating at homes of family or friends l. Searching in trash, scanning locales for leftovers
Other trade-offs	a. Going without heat, electricity or water b. Reducing use of prescribed medications/foregoing medical care c. Not paying rent d. Limiting connectivity: phone/internet/computer
Income generation	a. Finding another legal/on the books job b. Working overtime c. Working under the table (waitress, cooking, housekeeping, childcare) d. Selling blood/plasma e. Selling items (food, clothing, furniture, jewellery, tin cans,

	recyclables, scrap metal, drugs) Pole Dancing/Stripping (formal and informal work) f. Sex work/tricking g. Selling food stamps
Public Assistance Participation	a. Temporary Assistance for Needy Families (TANF) b. Supplemental Nutrition Assistance Program c. Women, infants and Children d. LIHEAP Subsidies: Childcare, housing, etc. Lying about presence/knowledge of birth father/not reporting small increments of income
Social networks	a. Social/emotional support b. Sending kids to friends and family c. Store credit with well-known family store owners d. Moving in with others e. Sharing food stamp money f. Pooling financial resources g. Borrowing money h. Seeking gifts of food/money
Stealing	a. Stealing food b. Stealing other items to offset cost of food or to sell
Giving up children	Turning children over to social services
	Emotion-focused
Aspirational	"This too shall pass," faith/religion, breaking the cycle with my children, this is better than when I was a kid
Disengagement/Resignation	Isolating oneself, not asking for help
Substance Abuse	Using alcohol, tobacco or illicit drugs to escape
Distraction	Mind tricks, looking at menus to curb hunger
Self-harm	Not eating intentionally
Enduring abuse	Tolerating physical, sexual, or emotional abuse for financial support
Anger/violence	Frustration, short fuse, anger as an outlet

The coping strategy index (CSI) is a surrogate measure for the food access aspect of food safety and is measured based on a particular set of behaviours, each with a universal gravity weighting of its own (Maxwell & Caldwell, 2008). The five standard coping strategies and their severity weightings are:

1. eating less preferred/expensive foods (1.0);
2. borrowing food or relying on help from friends and relatives (2.0);
3. limiting portion sizes at meal times (1.0);
4. limiting adult intake so that small children can eat (3.0) and
5. reducing the number of meals per day (1.0).

Answers to the simple question "In the past 7 days, if there have been times when you did not have enough food or enough money to buy food, how many days has your household had to adopt a particular food-based coping strategy" are used to create the CSI. For each household, a score is given to each coping strategy. The score = (frequency with which coping strategy is used) × (severity weight). The scores for each coping strategy are added together to give a composite score for each household. Higher values of the index indicate more severe food insecurity (Saaka, Oledele, Larbi & Hoeschle-Zeledon, 2017).

In conclusion, many households opt for mechanisms to help ease and takeout food insecurity completely. These mechanisms are classified as coping strategy and are measured with a coping strategy index to assess the behaviours, attitudes to solve problems of food insecurity. Some of these coping strategies employed by pregnant teenagers include reducing family size, eating once in a day, seeking help from neighbours, working overtime, stealing foods, among others.

Teenage pregnancy

A pregnancy can take place at any time before or after puberty (Ghose & John, 2017). WHO (2020) described the era between 10 and 19 years as adolescence; with distinctive traits of physical, social, psychological and reproductive health. Adolescent pregnancy is defined as pregnancy under the age of 20 years and in both developed and developing countries, this is a problem (Ghose & John, 2017). In developing countries, the rates of teenage pregnancy are increasing and adverse maternal and perinatal results are rising (Kassa, Arowojolu, Odukogbe & Yalew, 2018). UNFPA (2020) stated that, every day in developing countries, 20,000 girls under age 18 give birth. Altogether, approximately one-fifth of teenagers in Africa are pregnant (WHO, 2020). Additionally, WHO stated that every year, an estimated 21 million girls aged 15–19 years in developing regions become pregnant and approximately 12 million of them give birth. Darroch, Woog, Bankole, and Ashford (2016) also expressed that at least 777,000 births occur to adolescent girls younger than 15 years in developing countries. These have made adolescent births in high, medium and low incomes countries are a global issue (WHO).

Various factors lead to pregnancy and birth in young people (WHO, 2013). According to Kozuki, Lee, and Silveira (2013), girls are under pressure in many societies to marry and give birth early. Several socio-demographic factors like residence, marital status, educational status of adolescents, their mother's and father's, and parent to adolescent SRH communication were associated with adolescent pregnancy (UNFPA, 2015). Girls choose to get pregnant in many countries because they have limited opportunities for

education and jobs. Motherhood is also respected in such cultures, and marriage or partnership and childbearing can be the best of the few available choices (WHO, 2014). In the previous years, WHO (2011) emphatically reported that because of knowledge gaps and misconceptions on where to obtain contraceptive methods and how to use them, adolescents who may want to prevent pregnancies may not be able to do so. Another cause of unintended pregnancy is sexual harassment, which is common in some nations, with more than a third of girls claiming that their first sexual experience was coerced (Raj & Boehmer, 2013). Again, several biological factors such as timing of pubertal development, hormone levels, and genes are also related to adolescent pregnancy risk because of their association with adolescent sexual intercourse (Dawan & Himanshi, 2018).

As many teenagers are not ready for pregnancy or childbirth physically or mentally, this sexual occurrence makes them more susceptible to complications that have devastating health effects for them (Ghose & John, 2017). Early pregnancies among teenagers have serious health implications for teenage mothers and their children (WHO, 2020). These implications can be physical, psychological, emotional and social. Neal, Matthews, and Frost (2015) reported that the leading cause of death among girls aged 15-19 years worldwide is pregnancy and childbirth complications, with low- and middle-income countries responsible for 99 percent of global maternal deaths among women aged 15-49 years. Adolescent mothers between the ages of 10 and 19 face a greater risk of eclampsia, puerperal endometritis and systemic infections than women between the ages of 20 and 24 (WHO, 2016). It was

further reported that infants born to mothers under the age of 20 face greater risks of low birth weight, preterm delivery and extreme neonatal conditions.

Pregnancy anemia per se is not caused by young people, but poor diet and inconsistent healthcare practice make them vulnerable (Ghose & John, 2017). They further reported that nutritional requirement for an adolescent mother is more in comparison to adult mother as the former's body is still developing. Raj, and Boehmer (2013) identified stigma, alienation or abuse by partners, parents and peers as some of the social repercussions for unmarried pregnant teenagers. They added that girls who become pregnant before 18 years of age are more likely to experience marital or partner abuse. Similarly, WHO (2015) reported that adolescent pregnancy and childbearing usually causes girls to drop out of school, while efforts are underway to encourage them to return to school after childbirth, this may well jeopardize the potential education and career opportunities of girls. This poses numerous human rights concerns, i.e. an adolescent pregnant girl is forced to leave school, deprives her right to education, and is also prohibited from using any knowledge related to contraception or reproductive health, so her right to health is also denied (Ghose & John).

Research results are most consistent with the fact that the closeness or connectedness of parents/children, parental supervision or control of children's behavior, and the value of parents against teen intercourse (or unprotected intercourse) minimize the risk of teenage pregnancy (Miller, Benson & Galbraith, 2010). Consequently, Ghose and John concluded that if the youth is healthier, the future generation and country will become healthier. Therefore, teenagers need our special attention.

Health-related quality of life of pregnant adolescents

According to Samiyan (2011), quality of life" is an ambiguous term. Quality of life (QOL) is characterized by the World Health Organization as individuals' perception of their role in life in relation to their goals, desires, standards, and concerns in the sense of the culture and value systems in which they live. Also, quality of life is described by Carter, Breen, Yaruss, and Beilby (2017) as a person's satisfaction with their life and environment. Needs, demands, interests, life style, and other visible and intangible factors that influence a person's well-being are all included in his description. Ahmadi and Taghavi (2015) opine that a person's quality of life is their idea of how they want to live their life and in the other hand, it requires the quality of the available circumstances, such as the society's or culture's prevailing atmosphere. Sovariova (2016) lists demographic predictors such as age and sex, socio-economic characteristics such as education and social status, cultural influences and importance, health factors such as functional status, health care facilities, and personality traits as the key indicators of quality of life. Health, physical comfort, and mental and social dimensions all contribute to one's quality of life. The subjective sense of physical and/or mental well-being is often included in the definition of quality of life, which has several dimensions. It is often referred to as "life satisfaction" in its broadest and most inclusive sense.

After World War II, the word quality of life (QOL) was coined in the United States. It used to mean the good life, and it was limited to whether or not you had traditional consumer products. Affluence – owning a vehicle, a home, or other valuables – was correlated with a high quality of life. To put it

another way, the QOL idea evolved from “have” to “be”. High quality of life was reserved for the healthy back then. Only a stable society, according to the statement, is capable of generating material and cultural resources, allowing people to use them, and achieving the high level of production that is reflective of a higher quality of life. The method of determining QOL was given special attention. Finally, general QOL was described as an individual's assessment of his or her own life situation over a period of time (Owczarek, 2010).

Chinnakali, Upadhyay, Shokeen, Singh, Kaur, and Singh (2014) report that a healthy lifestyle is a valuable resource for reducing the incidence and effect of health conditions, promoting health, adapting to stressors, and improving quality of life by contributing to the conservation, protection, and promotion of health and well-being. According WHO, quality of life is a general term that is affected in a variety of ways by the subject's physical health, psychological condition and degree of freedom, social relationships, and relationship with the basic elements of his or her environment. As a consequence, Mogos, August, Salinas-Miranda, Sultan, and Salihu (2013) expressed that quality of life is based on a combination of objective (related to the nature of the atmosphere and living conditions) and subjective variables (linked to the personal sphere and measurable in terms of satisfaction and well-being).

In addition, Health-related quality of life refers to the state of one's health as an important factor in one's overall satisfaction. Health-related quality of life falls under the broader term quality of life (QoL) (Zack & Centers for Disease Control and Prevention [CDC], 2013). Health-related

quality of life is made up of what the person feeds his/her body with which in turn affects the nutritional status of the body (Karimi & Brazier, 2016). Health-related quality of life further encompasses the physical and mental health of an individual (Singh & Dixit, 2010). Nutrition, exercise, self-care, tobacco and alcohol use, social relationships, and stress management are all aspects of life style that are related to food security (Keino, Plasqui, Van den Borne, 2014). The "good life" is incomplete without food and nutrition. Food is a sensory and psychological delight in and of itself. Meals can also bring a sense of protection, purpose, order, and structure to a person's day; they can give them feelings of freedom, power, and superiority over their surroundings; and they can allow them to make food choices (Amarantos, Martinez, & Dwyer, 2011). Malnourished people are more likely to be disabled, and disabled people are more vulnerable to food issues due to their reliance on others. This will go in a long way to affect their quality of life since they won't be able to live their life to their satisfaction.

The relevance of health-related quality of life during pregnancy cannot be overstated (Mazuchova, Kelcikova, & Dubovicka, 2017). Pregnant women's physical, spiritual, and social wellbeing, as well as their overall quality of life, experience major changes during pregnancy. Desmir, Balci, and Gunay (2010) state that a number of changes that women go through during pregnancy may have a negative effect on their health-related quality of life. Physical symptoms associated with pregnancy include weakness, nausea, vomiting, heartburn, leg cramps, hemorrhoids, and shortness of breath, all of which may have a detrimental impact on a woman's life during her pregnancy. As a result, pregnant women's quality of life is estimated to be poorer than that

of non-pregnant women of the same generation. Chang, Kenney, and Chao (2010) added that even in uncomplicated pregnancies, these changes can impact pregnant women's quality of life as well as maternal and child health (pregnancy monitoring, pregnancy outcomes, maternal postpartum health, and the psychomotor development of the infant). Also, during a normal pregnancy, women's vitality is diminished, resulting in a decline in health-related quality of life (Abbaszedeh, Bagheri, & Mehran, 2009). The pregnancy cycle has a negative impact on the mother and child as a woman's physical, psychological, and social growth has not been completed. As a result, pregnant teenagers are estimated to have a poorer quality of life than pregnant adults. The key indicator for determining prenatal health status is quality of life, which is one of the major concerns of health professionals (Zarei, Mirghafourvand, Mohammad-Alizadeh-Charandabi, Effati- Daryani, & Shiri-Sarand, 2018). The use of data on health-related quality of life could lead to more successful interventions.

In conclusion, food insecurity has an adverse impact on the quality of life of pregnant women, pregnant adolescents to be precise. Not having access to quality nutritious food can cause a lot of health implications to the mother and the unborn child. These complications can live with the pregnant adolescent for the rest of her life. Food insecurity is therefore a major concern when it comes to the life of pregnant adolescent since it can affect the quality of life of the individual

Empirical review

This section of the chapter focuses on studies which are related to this study. The empirical review of the study is vital since it would serve as the

basis to compare, contrast, critically evaluate how each source contribute to the body of knowledge about the topic under study. It also helps the researcher to integrate the findings of the sources into his/her argument about the state of knowledge on the topic. The reviews are organized based on the research questions.

Food Insecurity Status among Pregnant Adolescent

Gholami, Sani, Askari, Jahromi, and Dehghan (2013) conducted a study on Food Insecurity Status and Associated Factors among Rural Households in North-East of Iran. The purpose of the study was to assess the prevalence of food insecurity and associated factors among pregnant teenagers in north-east of Iran. The researcher employed a cross-sectional study design where 4647 rural households (18,061 persons) were studied in Neyshabur, a city in north-east of Iran. The Iranian version of the Six-Item Short questionnaire of Household Food Security Scale was used to measure food insecurity. Logistic regression model was used to estimate odds ratios (OR) and 95% confidence intervals (CI). From the study, the total prevalence of food insecurity in this study was 40.9% (95% CI 39.49-42.31). They concluded that food insecurity is prevalent among pregnant teenagers of Neyshabur, so it is an important public health problem in this region

Also, Obayelu (2012) conducted a research to examine the food insecurity status among households of pregnant teenagers in Nigeria. This study employed a well-structured questionnaire to obtain data from a cross-sectional survey of 396 households selected from Kwara and Kogi States of NCN with a multi-stage sampling technique. To analyse the data, descriptive statistics and multivariate-ordered logit analyses were used. The study presents

findings on food insecurity in the North Central Nigeria. The descriptive results revealed that only 16% of the households of pregnant teenagers were food secure (FS), 36% food insecure without hunger, 28% FS with moderate hunger and 21% food insecure with severe hunger. The results from the ordered logit revealed that marital status, total household expenditure, level of education, occupation of the adolescent, household dependency ratio, and social capital significantly affect pregnant teenager's household's food security status. He further suggested that in order to elevate the burden and to transit from food insecure to Food Secure, birth control should be encouraged.

Similarly, a study by Kazemi, Masoumi, Shayan and Yasaghi (2020) on the prevalence of food insecurity in pregnant adolescents and its association with gestational weight gain pattern, neonatal birth weight, and pregnancy complications in Hamadan County, Iran, in 2018 indicated the effects of food insecurity on the weight of the pregnant adolescent and the unborn baby. The cross-sectional study was conducted on 772 mothers who visited comprehensive health service centres during the first 10 days after delivery in 2018. The instruments included the demographic and midwifery information questionnaire and an 18-item questionnaire devised by the U.S. Department of Agriculture. The significance level was considered to be 0.05. The findings showed high prevalence of food insecurity in pregnant adolescents and the relationship between their food insecurity status and pregnancy complications such as weight gain.

Yadegari, Dolatian, Mahmoodi, Shahsavari, and Sharifi (2017) also conducted a study on the relationship between socio-economic factors and food insecurity in pregnant adolescents. The study aimed at defining the

levels of food insecurity and investigating its correlation with socioeconomic factors among pregnant adolescents in city of Rasht (Iran) in 2014. The cross-sectional study included 420 pregnant women in their 14 to 42 weeks of pregnancy. The sampling method was convenience, and the data were collected using demographic-obstetrics, socioeconomic factors, and food security status questionnaires through face-to-face interviews. The data were analyzed using SPSS 19. The results from the study indicated that 30.9% of the pregnant women had food insecurity (19.6% had food insecurity without hunger, 8.9% had moderate hunger, and 2.4% had severe hunger) and there was a significant relationship between socio-economic status of the teenager and food insecurity that is, teenagers with poor economic status had higher odds of having food insecurity as compared to pregnant teenagers with good economic status.

Ijarotimi and Erota (2018) have also conducted in Africa a study investigating the food insecurity of household and its nutritional implications for pregnant teenagers from selected local authorities in Lagos, Nigeria. A cross-sectional analysis was conducted in public and private secondary schools among school children (9-20 years). Participants (2000) from rural and urban communities in three Local Government Areas of the State of Lagos were selected with a multi-stage sample technique. The access scale to food insecurity (HFIAS) was collected using an advance and semi-structured questionnaire. The results revealed that the prevalence of food insecurity was mild (15.9%), moderate (8.0%) and severe (4.6%) in households, while the remaining families enjoyed food coverage. The study concluded that nutrition

and economic intervention programmes are needed to enhance optimal nutrition for pregnant women.

Again, a study by Moafi, Kazemi, Siboni and Alimoradi (2018) in Iran to investigate the relationship between the health-related quality of Life during pregnancy among pregnant adolescents and their household food insecurity status. The study was cross-sectional study where a random cluster sampling method was used to select eight urban health and medical centres from four geographical regions of Qazvin city, Iran. Data was collected using the SF-36 Health-related Quality of Life, Household Food Insecurity Access Scale and a demographic questionnaire for recording the women's gestational and demographic information through interviews. Descriptive and inferential statistics including Chi-square test, one-way analysis of variance with Bonferroni post-hoc test and multiple linear regression were used for data analysis. In relation to the food insecurity status, 56.1% of the pregnant adolescents were in a food secure status, but 43.9% of them experienced mild to severe food insecurity. The main findings of the present study showed that the prevalence of food insecurity during pregnancy was considerable. The household food insecurity causes changes in the food consumption pattern and also leads to the reduced food diversity of the family. Furthermore, the household food insecurity has adverse effects on pregnant teenager's health in relation to Quality of life.

Also, a study by Grilo, Earnshaw, Lewis, Stasko, and Magriples (2015) on Food Matters: A cluster randomized controlled trial (RCT) of group prenatal care at 14 community hospitals and health centres in New York City. Study sites were randomized to deliver group prenatal care (Centering

Pregnancy Plus) Food Insecurity among Pregnant Adolescents and Infant Birth Outcomes. The findings of their study revealed that more than one-half which is 26.1% of pregnant adolescents reported acute food insecurity 26.1% and 26.6% was chronic food insecurity. Pregnant adolescents who were food secure were more likely to be financially self-sufficient, less likely to be housing insecure, and less likely to drink or smoke during pregnancy.

In Ghana, a related study on Household food insecurity, coping strategies, and nutritional status of pregnant teenagers in rural areas of Northern Ghana was conducted by Saaka, Oledele, Larbi, and Hoeschle-Zeledon (2017). The study assessed household food insecurity, its determinants and relationship with nutritional status of pregnant teenagers belonging to different gestational ages. This study was an analytical cross-sectional survey involving pregnant women in different stages of gestation and with a sample size of 400. The result from the study indicated that food insecurity was highly prevalent but it was not associated with maternal thinness of pregnant teenagers. The risk of maternal thinness increased as the gestational age increased and this has a great potential of adversely influencing pregnancy outcomes and overall quality of life.

Additionally, Seidu, et al. (2020) sought to assess food insecurity among pregnant adolescents in Ghana. In the study, both bivariate and multivariate analyses were done. The findings of the research indicated that 57.8% of pregnant adolescents had experienced food insecurity. This shows that the prevalence of food insecurity among pregnant adolescents in Ghana is high.

Factors Contributing to Food Insecurity among Pregnant Adolescents

Obayelu (2012) conducted a research to examine the food insecurity status in Nigeria. This study employed a well-structured questionnaire to obtain data from a cross-sectional survey of 396 households selected from Kwara and Kogi States of North Central Nigeria with a multi-stage sampling technique. To analyse the data, descriptive statistics and multivariate-ordered logit analyses were used. The study presents findings on food security in the North Central Nigeria (NCN). The descriptive results revealed that only 16% of the pregnant teenager's households were food secure (FS), 36% food insecure without hunger, 28% FS with moderate hunger and 21% food insecure with severe hunger. The results from the ordered logit revealed that marital status, total household expenditure, level of education, occupation of the adolescent, household dependency ratio, and social capital significantly affect the pregnant teenager's household's food security status. He further suggested that in order to elevate the burden and to transit from food insecure to Food Secure, birth control should be encouraged.

Research by Abdirahman (2019) aimed to assess nutrition knowledge, dietary practices and nutrition status of pregnant adolescents. A cross sectional analytical design was used, to carry out the study. A sample size of 258 pregnant adolescents visiting the various Health Facilities was selected using a systematic sampling technique. The researcher administered questionnaire was used for collecting data. Additional data was collected using focus group discussions guides and key informants' interviews. Nutrisurvey software was used to analyze dietary data for amount of nutrients consumed. From the study, Results showed that the proportion of the pregnant adolescents (22.1%)

were unmarried and with up to primary level education (68.4%). They were mainly casual workers or pastoralists earning an average monthly income of 6,934± 625 KES. The mean nutrition knowledge score was 46.4 ± 6.8 was low with majority (47.5%) having moderate nutrition knowledge. The study concluded that the food insecurity was as a result of by low education level as well as low nutrition knowledge level.

Also, Drammeh, Hamid and Rohana (2019) focused on the determinants of household food insecurity and its association with child malnutrition in Sub-Saharan Africa: A Review of the Literature. The purposes of this article were Inform governments, law makers and government agencies on the role of domestic food and child malnutrition determinants and to prepare strategies on improving domestic food security in Sub-Saharan Africa especially among pregnant teenagers. Few of the multiple factors highlighted in the article included the gender of the household head of the adolescent; age, educational status, household size, income, poverty and food price were the main determinants that were shown to affect the status of household food insecurity and lead to child malnutrition and food insecurity among pregnant teenagers in Sub-Saharan Africa.

A research on household food insecurity and related dietary and socioeconomic factors for pregnant teenagers was carried out in Asia, Jahan, Mahbub and Ahmed in central Bangladesh by Moafi, Kazemi, Siboni and Alimoradi (2018). Participants' food insecurity was measured using the scale of Household Food Insecurity Access (HFIAS). The study was cross-sectional study where a random cluster sampling method was used to select eight urban health and medical centres from four geographical regions of Qazvin city,

Iran. Descriptive and inferential statistics including Chi-square test, one-way analysis of variance with Bonferroni post-hoc test and multiple linear regression were used for data analysis. Around 76% of respondents were food-safe, 23% were slightly food-insecure and only 1% were moderately food-insecure. Severe food insecurity was not noted among respondents in Rajshahi. Some 17 percent of the participants were nervous as well as unsure about food supply in their household, some 23 percent said they had to eat inadequate quality food, and only one percent indicated that they had not eaten enough food during the months prior to the survey. Some socio-economic variables were significantly correlated with household food insecurity in respondents, such as household size, respondents' level of education, grooms' level of education, husband employment and income per month.

Similarly, Patel and Surkan (2016) conducted a study on unwanted childbearing and household food insecurity in the United States. The main purpose of the study was to investigate the association between mother's and father's report of unwanted teenage pregnancy and exposure to household food insecurity among teenagers residing in two-parent households in the United States. The finding of the study indicated that parents reporting unwanted teenage pregnancy are more likely to be exposed to food insecurity and potentially related stressors.

Effect Food Insecurity on the Quality of Life of the Pregnant Adolescents

Moafi, Kazemi, Ziboni and Alimoradi (2018) conducted a study on the effect of food insecurity and quality of life among pregnant adolescents. The study was cross-sectional study where a random cluster sampling method was used to select eight urban health and medical centers from four geographical

regions of Qazvin city, Iran. Data was collected using the SF-36 Health-related Quality of Life, Household Food Insecurity Access Scale and a demographic questionnaire for recording the women's gestational and demographic information through interviews. Descriptive and inferential statistics including Chi-square test, one-way analysis of variance with Bonferroni post-hoc test and multiple linear regression were used for data analysis. Overall pregnant women's quality of life had the highest score in the domain of 'social performance' and the lowest one in the domain of 'role limitation due to physical reasons'. Pregnant adolescents with food insecurity had the lowest score in role limitation due to physical reasons domain of quality of life for mild, moderate and sever food insecurity. The results of multiple linear regression showed that one-unit reduction of household food security significantly decreased the total quality of life.

Another study conducted by Darmo and Caillavet (2017) focused on the effect of food insecurity on a household level of pregnant teenagers in developed countries. The study focused on two issues: the individual determinants of food insecurity, and the impact of food insecurity on quality of life. On the problem of the link between food insecurity and quality of life, reviewing the impact on children's health, adult health, diet and nutritional intake, and weight status, the results coincide to demonstrate that food insecurity is linked and has significant effect on poor quality of life at all ages.

Similarly, a research conducted by Diddana (2019) on the factors associated with the food insecurity and quality of life of pregnant adolescents in Dessie town, northeastern Ethiopia. Community-based cross-sectional study design was employed and Six hundred four (604) pregnant women have

participated. A two-stage sampling method was applied to select participants. Also, Socio-demographic and socio-economic data were collected using a structured interviewer-administered questionnaire. From the data collected, the findings showed that poor quality of life which came with food insecurity (AOR = 3.25; 95% CI: 1.91, 5.54) was significantly associated (P < 0.05) with undernutrition.

Lastly, Abdirahman (2019) aimed to assess nutrition knowledge, dietary practices and quality of life of pregnant adolescents. A cross sectional analytical design was used, to carry out the study. A sample size of 258 pregnant adolescents visiting the various Health Facilities was selected using a systematic sampling technique. The researcher administered questionnaire was used for collecting data. Additional data was collected using focus group discussions guides and key informants' interviews. Nutrisurvey software was used to analyze dietary data for amount of nutrients consumed. From the study, Results showed the quality of life was poor with 31.1%. Also, there was a significant relationship (r=0.069; P<0.033) between the dietary diversity score and quality of life. The poor quality of life was associated with food insecurity and frequent illness.

Food Insecurity Status and Economic Status of Pregnant Adolescents

Carter, Lanumata, Kruse and Gorton (2010) conducted a study which aimed at investigating the demographic and socio-economic determinants of food insecurity in New Zealand. Respondents were classified as food insecure if, in the past 12 months, they had to use special food grants or food banks or have been forced to purchase cheaper food to afford other items or have not had any fresh meal in a while. Logistic regression analyses were used to

investigate the association of demographic and socio-economic factors on food insecurity. From the study, food insecurity was associated with sole parenthood, unmarried status, younger age groups, Māori and Pacific ethnicity, worse self-rated health status, renting, being unemployed and lower socioeconomic status. Income was the strongest predictor of food insecurity in multivariate modelling. They further suggested that targeted policy interventions aimed at increasing money available in households are needed.

Again, Obayelu (2012) conducted a research to examine the food security status in Nigeria. Study presents findings on food security in the North Central Nigeria (NCN). This study employed a well-structured questionnaire to obtain data from a cross-sectional survey of 396 households selected from Kwara and Kogi States of NCN with a multi-stage sampling technique. To analyse the data, descriptive statistics and multivariate-ordered logit analyses were used. The descriptive results revealed that only 16% of the households were food secure (FS), 36% food insecure without hunger, 28% FS with moderate hunger and 21% food insecure with severe hunger. The results from the ordered logit revealed that marital status, total household expenditure, level of education, occupation of the adolescent, household dependency ratio, and social capital significantly affect household's food security status. He further suggested that in order to elevate the burden and to transit from food insecure to Food Secure, birth control should be encouraged.

Seidu (2015) conducted a study to investigate the socio-economic factors influencing pregnant teenager's food insecurity in the Tano South district of the Brong Ahafo Region of Ghana. The explanatory variables found to be influencing the food insecurity status included level of education,

income, and access to finance. Access to finance was the most important for the attainment food security.

In a similar study conducted by Yadegari, Dolatian, Mahmoodi, Shahsavari, and Sharifi (2017) also focused on the relationship between socioeconomic factors and food insecurity in pregnant adolescents. The study aimed at defining the levels of food security and investigating its correlation with socioeconomic factors among pregnant adolescents in city of Rasht (Iran). The present cross-sectional study included 420 pregnant women in their 14 to 42 weeks of pregnancy. The sampling method was convenience, and the data were collected using demographic-obstetrics, socioeconomic factors, and food security status questionnaires through face-to-face interviews. The data were analyzed using SPSS 19. The results from the study indicated that 30.9% of the pregnant women had food insecurity (19.6% had food insecurity without hunger, 8.9% had moderate hunger, and 2.4% had severe hunger) and there was a significant relationship between socio-economic status of the teenager and food insecurity. that is, teenagers with poor economic status had higher odds of having food insecurity as compared to pregnant teenagers with good economic status.

Chapter Summary

The chapter has reviewed relevant literature on the theoretical review, conceptual and empirical review. In theoretical review, Abraham Maslow's theory of needs and the systematic innovation approach were used to support the purpose of the study. The relevant concepts were also reviewed based on the purpose of the study whiles relevant studies conducted on the topic under investigation were also review and discussed in the empirical review.

CHAPTER THREE

RESEARCH METHODS

The study was conducted to collect food security data from pregnant teenagers in the Shama district. This chapter covers the research methodology applied in the study. This involves research design, study area, population, sample and sampling procedure, data collection instruments, data collection procedure and data processing and analyses.

Research Design

The descriptive research design was adopted for this study. According to McCombes (2019), descriptive research aims at defining a population, condition or phenomenon accurately and systematically. It can answer questions about what, where, when and how, but not why. A descriptive design provides a general descriptive picture of a situation to establish norms and base line data for consideration by researcher in making their decisions to assist them raise relevant questions (Ary, Jacob & Razavieh, 2010). Also, Price, Jhagiani, and Chiang (2018) defined descriptive research design as a qualitative and quantitative method in which interest variables are calculated using self-reports in which respondents explicitly report on their thoughts, opinions, feelings and behaviours. The descriptive research design defines the characteristics of the population or phenomena being investigated (Adi, 2019). In this study, the food insecurity status of pregnant adolescents was ascertained. Descriptive research designs according to Ary, Jacob and Razavieh (2010) is the assessment of the status of a given population in relation to certain factors of interest to a researcher like the food insecurity situation of pregnant teens, the factors which are thought to contribute to

pregnant adolescents' levels of food safety, the perceived effects of food level levels.

Furthermore, descriptive research design determines and reports the way things are. In view of that, the researcher sought to obtain current information on the food insecurity among pregnant adolescent in the Shama District and the therefore the descriptive survey was appropriate. One of the major advantages of using descriptive design is the flexibility in the type of range of variables that can be measured. As Collie and Rine (2009) pointed, some of these variables (food insecurity and quality of life among pregnant adolescents) may be difficult to investigate in any other way, at least quantitatively. The fact that descriptive designs are non-experimental and relatively adaptable in terms of the data collection procedure allows them to be used in situations where other methods cannot be employed. The researcher considered this design because it is a successful way to gather data about a wide number of individuals considering the sample size for this research (Collie & Rine 2009).

Study Area

Shama District is one of the 18 districts in Ghana's Western Region. Shama is its capital. The district is one of the districts and municipalities. It opened on 29 February 2008. The population in Shama district is around 88,314 and it covers a border with the metropolis of Sekondi-Takoradi and the municipality of Komenda-Edina-Eguafo-Abrem (KEEA) (Ghana Statistical Services, 2014). Of the population, 60.9 percent are literate and 38.4 percent are non-literate. The proportion of literate males is higher (63.2 %) than that of females (58.6%). A little over six out of ten people (60.9%) indicated they

could read and write both English and Ghanaian languages. With reference to school attendance, of the population aged 3 years and above, out of 31,721 in the District, 34.1 percent has never attended school, 50.9 percent are currently attending and 41.3 percent have attended in the past. With regard to the occupation of the populace, 15 years and older population, representing 63.1% are self-employed, 5.6% contribute to family labour, 1.9% are in formal employment and 0.3% are domestic workers (house helps). The private informal sector is the main employer in the district and hires 86.5 per cent of the population (Kankam & Robadue, 2013). The Shama district's people are mainly involved in fishing and trade. The main occupation of the district citizens is fishing. The map of Shama District is provided in Figure 1.

Figure 2*: Map of Shama District*

Source: Ghana Statistical Service (GSS)

Population

According to Nitko (2004), a population refers to the entire aggregation of cases that meet a designated set of criteria. Bryman (2001) defined population as any set of persons or subjects that possess at least one common characteristic**.** The target population comprised pregnant adolescents from Seventeen (17) Health Centres and Clinics in the district (Benedict Hospital, VRA Hospital, St. Edwards Clinic, Help Line Hospital, Komfueku Health Centre, Supom Dunkwa Health Centre, Anto Chip Compound, Bentsir Chip compound, Anopansu Chip Compound, Twriboano Chip Compound, Abuesi Chip Compound, Living well Chip Compound, Assorku-Essaman Chip Compound, Upper Inchaban Chip Compound and Lower Inchaban Chip Compound) and its environs with a total population of 471. This number was obtained from the various hospitals and clinics based on their available data on pregnant adolescents. The breakdown of pregnant women in the various hospitals and health centres is provided in Table 3.

Table 3: Distribution of Pregnant Adolescents in the various Health Centres

Health Centre	Number of Pregnant Adolescent
Benedict Hospital	60
VRA Hosptial	35
St. Edwards Clinic	35
Help Line Hospital	20
Komfueku Health Centre	23
Supom Dunkwa Health Centre	32
Anto Chip Compound	34
Bentsir Chip compound	23
Anopansu Chip Compound	35
Twriboano Chip Compound	43
Abuesi Chip Compound	21
Living well Chip Compound	43
Assorku-Essaman Chip Compound	42
Upper Inchaban Chcnip Compound	12
Lower Inchaban Chip Compound	13
Total	471

Source: Field Survey (2020)

Sample and Sampling Procedures

According to Creswell (2014), a sample refers to a sub-group of the population that is studied in order to make a generalisation regarding the target population. In selecting the sample for the study, Krejcie and Morgan (1970) table for determining sample size was used and according to Krecjie and Morgan's (1970), for a population 471 a corresponding sample of 238 was needed. Therefore, a total of 238 pregnant adolescents from the seventeen (17) selected Health Centres and Clinics in the Shama District were used for the study. In selecting the 238 pregnant adolescents, the proportionate stratified sampling technique was used to distribute the 238 pregnant adolescents over the seventeen health centres and clinics. The proportionate sample for each health facility was calculated by dividing the number of pregnant adolescents in that hospital by the total population of pregnant adolescent in all the seventeen heath centres multiplied by the sample size of 238. For instance, the sample size for Benedict Hospital was calculated by $\frac{60}{471} \times 238 = 30$. The proportionate sample for each of the health centres can be seen in the Table 4.

Table 4: Distribution of Proportionate Samples for the Health Centres

School	Population	Sample
Benedict Hospital	60	30
VRA Hospital	35	18
St. Edwards Clinic	35	18
Help Line Hospital	20	10
Komfueku Health Centre	23	12
Supom Dunkwa Health Centre	32	16
Anto Chip Compound	34	17
Bentsir Chip compound	23	12
Anopansu Chip Compound Twriboano	35	18
Chip Compound	43	21
Abuesi Chip Compound	21	11
Living well Chip Compound Assorku-	43	21
Essaman Chip Compound Upper Inchaban	42	21
Chcnip Compound	12	6
Lower Inchaban Chip Compound	13	7
Total	471	238

After knowing the number of pregnant adolescents to be sampled from each of the health centres, convenient sampling technique was used to sample the pregnant adolescent as they enter each of the health centres until the required number is ascertained.

Data Collection Instrument

In the data collection, a questionnaire was used. The questionnaire was made up of closed-ended questions. Questionnaire was the main data collection instrument. This is as a result of the benefits that can be derived from its usage including; the benefits of both time and money, among which are its low cost (Sarantakos, 2005). Again, questionnaire was used due to the cost-effective way of gathering data from a large number of respondents. The limitation of close-ended questions could give inaccurate responses since respondents would only be required to tick appropriate responses. The questionnaire was built on the basis of the Household Food Insecurity Access Scale (HFIAS, 2016). It must be emphasized that the instrument for measuring the food insecurity status of pregnant adolescent were crafted from this scale. The instrument consisted of 4-point Likert scale which has four sections consisting of A to D. Section A focused on the respondents' demographics. This consisted the age of respondents, level of education, residency, perceived economic status and number of pregnancies. The section B also contained items on food insecurity status of pregnant. The section C of the instrument also consisted of items which focused on the factors perceived to be contributing to food insecurity status of pregnant adolescent while section D focused on the health-related quality of life of pregnant adolescents.

Validity and Reliability of Instrument

Face validity

Face validity is the evaluation of an instrument's appearance by a group of experts and/or potential participants. It establishes an instrument's ease of use, clarity, and readability. The face validity points out that the instrument is pleasing to the eye and applicable for intended purpose (Alhassan, 2010) and measures what it is meant to measure. The questionnaire was given to experts to read for necessary corrections and suggestions. My colleagues, supervisors and other measurement and evaluation experts reviewed the instruments to ensure face validity.

Content validity

Content validity is the appropriateness of the content of an instrument (Biddix, 2009). That is, content validity determines whether the questions accurately assess what one wants to know. It involves taking representative questions from each of the sections of the unit and evaluating them against the desired outcomes. For example, in this study, the items on the questionnaire were constructed based on the literature reviewed. The items were constructed to generate responses to answer the research questions and hypothesis as much as possible. Also, the content of the instruments was assessed by the supervisors of this thesis and were found to be satisfactory.

Reliability of the instruments

To improve the reliability of the instrument, the instrument was piloted at Dwomo Chip Compound in order to ascertain the reliability. The pilot testing was conducted at Dwomo Chip Compound since it has characteristics of pregnant adolescents similar to the main Health Centres and Clinics used

for the study. The respondents were given draft copies of the questionnaire. After the pilot testing, Cronbach's alpha was used to determine the reliability coefficient of the items on the questionnaire. The reason for choosing Cronbach's alpha is that it measures internal consistency of items that are non-dichotomous (Kuder & Richardson, 1937; Cortina, 1993). The reliability coefficient calculated after the pilot testing was 0.73. According to George and Mallery (2003), a reliability coefficient greater than .70 is appropriate for data collection. Therefore, the reliability coefficients of .73 obtained in this study confirmed that the questionnaire used in the main study is within the acceptable benchmark of instrument being reliable.

Data Collection Procedures

An introductory letter and ethical clearance were acquired from the Department of Vocational and Technical Education, and the Institutional Review Board in the University of Cape Coast respectively and submitted to the Shama District Health Directorate for letter of approval. Contact was made with the authorities of the various hospitals as well as the heads of the antenatal units of the hospitals. Permission was sought from the appropriate authorities to be allowed to conduct the survey with the respondents during clinic hours. Data collection was done personally by the researcher. Upon contact with the respondents, the researcher briefly introduced the topic, the purpose of the research and the importance of the study to the participants. The participants were assured of confidentiality and voluntary participation was elicited. The questionnaires were distributed to respondents who accepted to participate in the survey. There was no identification information on the questionnaire thus the questionnaires were filled anonymously by the

participants. The researcher explained items that were confusing to the respondents, and those who were not able to read and write were assisted in responding to the questionnaire. Participants took about 20 to 35 minutes to complete the questionnaire. It is estimated that data collection lasted for 6 weeks; with the help of an assistant where necessary. The acquired data was kept confidential.

Data Processing and Analysis

When data collection was complete it was important to subject the data to statistical analysis and interpretation. In order to ensure that data gathered was devoid of errors, the questionnaires returned were thoroughly screened by the researcher in order to check for anomalies. Upon checking, incomplete and wrongly filled questionnaires were excluded. Information on the questionnaire collected from the survey was organised and entered in Statistical Package for Social Science (SPSS version 26). Once the data was entered into SPSS, it was subjected to data cleaning in order to correct any mistakes made during data entry. Frequencies were run to check for all errors such as outliers and missing values. The data was then collated and edited in order to address objectives that guided the study. Table 5 shows the statistical analytic tools that were used to analysed data on the three research question and the hypothesis that guided that study.

Table 5: Statistical analytic tool used in analysing data on the research question and hypothesis

Research Question/Hypothesis	Statistical Tool
Research question one	Means and Standard deviations
Research question two	Means and Standard deviations
Research question three	Pearson Product Moment Correlation Coefficient
Research hypothesis one	One-way Analysis of Variance (ANOVA)

Data on research questions 1 was analysed with means and standard deviation because the research sought to determine the level of food insecurity status of pregnant teenagers. Thus the means obtained communicate the food insecurity status. Data on research questions 2 was also analysed with means and standard deviation; this is because the focus was to determine factors that contribute to food insecurity among pregnant teenagers. Thus the factors with the highest means were considered as the major factors that contribute to food insecurity among pregnant teenagers in Shama District. Pearson Product Moment Correlation Coefficient was used to analyse data on research question 3. This was done in order to establish a relation between food insecurity and health-related quality of life (physical and mental health). The Pearson Product Moment Correlation Coefficient test was conducted at .05 level of significance and 95% confidence level. The relationship, further communicated the effect food insecurity has on the health-related quality of life of pregnant adolescents in Shama District. Finally the hypothesis was tested using one-way analysis of variance (ANOVA) which sought to examine

whether a statistically significant difference exists in perceived factors contributing to food insecurity status with respect to the economic status of pregnant adolescents in Shama District. This ANOVA test was also conducted at .05 level of significance and 95% level of confidence. The dependent variable was perceived factors of food insecurity, while the independent variable was economic status which was categorised as weak, moderate and good. The respondents were required to rank their own perceived socio-economic status.

Chapter Summary

This chapter examined the research methodology employed in the study. The chapter looked at the research design, population, sample and sampling procedure, instruments, data collection procedure and data analysis. The study adopted the descriptive research design, with Shama District as that study area. The estimated accessible population is 471, which consisted of pregnant teenagers gathered from healthcare facilities in the Shama district. The sample size used was 238 based on the recommendation of Krejcie and Morgan (1970) and applied the convenience sampling. The instrument used was the questionnaire which comprises various inventories. Data collection was done systematically. Preliminary data analysis included descriptive approaches such as mean, standard deviations, percentages and frequencies for the sample description. Further statistical analysis included inferential approaches such as Pearson Product Moment Correlation Coefficient and one-way ANOVA. All statistical tests were conducted at .05 level of significant and 95% confidence level.

CHAPTER FOUR

RESULTS AND DISCUSSION

The main purpose of the study is to examine food insecurity status among pregnant adolescent in the Shama District. The chapter four of this research report focused on presentation, analyses and discussion of the responses from the participants of the study. The statistical tools employed were descriptive and inferential, specifically, mean and standard deviation, Pearson product moment correlation coefficient and one-way ANOVA. The results have been presented in in two parts: presentation of the respondents' demographic results and the presentation of results to address the research questions and hypothesis.

Description of Sample: Demographic Information of Participants

This section presents the participants responses on their demographic characteristics which included age, level of education, residency, economic status and number of pregnancies. The summary of their responses on the demographic characteristics is presented in Table 6 to 10.

Age of respondents

Age of respondents was considered to be relevant for study since the focus was on teenagers. The ages range of pregnant adolescents are presented in Table 6

Table 6: Distribution of Age of Pregnant Adolescents

Age	Frequency	Percentages (%)
10-15	109	45.8
16-19	129	54.2
Total	238	100

Source: Field survey (2021)

From Table 6, it can be observed that, out of the 238 pregnant adolescents, 109 representing 45.8% were between the ages of 10 to 15 years whiles 129 representing 54.2% were also between the ages of 16 to 19 years. This means that from the pregnant adolescents which were sampled for the study, more of those between the ages of 16-19 years took part in the study than those between the ages of 10-15 years.

Educational level

The level of education of participants was another essential demographic that need to be established. The level of education of pregnant adolescents is presented in Table 7.

Table 7: Distribution of Level of Education Pregnant Adolescents

Level of Education	Frequency	Percentages (%)
No Formal Education	31	13.0
Basic Education	100	42.0
Secondary	107	45.0
Total	238	100

Source: Field survey (2021)

From Table 7, it can be observed that, out of the 238 pregnant adolescents, 31 representing 13.0% had no formal education whiles 100 pregnant adolescents representing 42.0% had only primary education. Again, 107 representing 45.0% had secondary. This also suggests that from the pregnant adolescents which were used for the study, more of those who have secondary education took part in the study than those had no formal education and those with only primary education.

Residency

As part of the demographic data, the residence of participants was considered. The distribution of place of residence of pregnant adolescents is presented in Table 8.

Table 8: Distribution of Residency of Pregnant Adolescents

Residency	Frequency	Percentages (%)
Rural	153	64.3
Urban	85	35.7
Total	238	100

Source: Field survey (2021)

Table 8 shows that out of the 238 pregnant adolescents, 153 representing 64.3% were pregnant adolescents living in the rural centres whiles 85 representing 35.7% were pregnant adolescents living in the urban centres. This indicates that from the pregnant adolescents which were sampled for the study, more of them were living in the rural centres.

Economic status

As part of the purpose of the study, there was the need to identify the economic status of respondents. The economic status was categorised and respondents were required to select whether their economic status was weak, moderate or good from the perspective of the participants. The distribution of economic status of pregnant adolescents is presented in Table 9.

Table 9: Distribution of Economic Status of Pregnant Adolescents

Economic Status	Frequency	Percentages (%)
Weak	134	56.3
Moderate	94	39.5
Good	10	4.2
Total	238	100

Source: Field survey (2021)

From Table 9, it is obvious that, out of the 238 pregnant adolescents, 134 representing 56.3% have weak economic status whiles 94 representing 39.5% have moderate economic status. Furthermore, 10 representing 4.2% also have good economic status. This means that from the pregnant adolescents which were used for the study, majority of them had weak economic status.

Number of pregnancies

Finally, the research sought to establish the number of pregnancies the participants have experienced. The distribution of number of pregnancies of pregnant adolescents is presented in Table 10.

Table 10: Distribution of Number of Pregnancies of Pregnant Adolescents

Number of Pregnancy	Frequency	Percentages (%)
One	175	73.5
Two	63	36.4
Total	238	100

Source: Field survey (2021)

It can be observed from Table 10 that, out of the 238 pregnant adolescents, 175 representing 73.5% were pregnant adolescents who have been pregnant for the first time whiles 63 representing 36.4 % were pregnant adolescents who have also been pregnant for the second time. This indicates that from the pregnant adolescents which were used for the study, majority of them have been pregnant for the first time.

Research Question 1: What is the food insecurity status of pregnant adolescents in Shama District?

This research question sought to find out the food insecurity status of pregnant adolescents in Shama District. To achieve the objective of this

research question, pregnant adolescents were required to respond to items measured on a four-point Likert-type scale with 1= never, 2= rarely, 3= sometimes and 4= very often. Thus 4 indicate the strongest agreement to the statement while 1 indicates the least agreement to the statements. Means and standard deviations were used to analyse the responses of respondents. In the analysis, mean values above 2.5 (1+2+3+4/4 =2.5) shows that majority of the respondents are not in favour of the statement whiles a mean value below 2.5 shows that majority of the respondents are in favour of the statement. To further judge the food insecurity pregnant adolescents, the overall mean was used. A summary of the responses is presented in Table 11.

Table 11: Food Security Status of Pregnant Adolescents

	Statements	M	SD
1	In the past four weeks how often were you or any household member have to eat some foods that you really did not want to eat because of a lack of to obtain other types of food.	2.16	0.99
2	In the past four weeks how often were you or any household member have to eat a smaller meal than you felt you needed because there was not enough food	2.07	0.96
3	In the past four weeks how often were you or any household member have to eat fewer meals in a day because there was not enough food	1.97	0.75
4	In the past four weeks how often were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources.	1.91	0.68
5	In the past four weeks how often did you worry that your household would not have enough food.	1.82	0.94
6	In the past four weeks how often were you or any household member had to eat a limited variety of foods due to a lack of resources.	1.77	0.79
7	In the past four weeks how often was there food to eat due availability of resources to get food.	1.74	0.77
	Total	1.92	0.84

Source: Field survey (2021) N = 238

$$\text{Overall Mean} = \frac{Total\ Mean}{Number\ of\ items} = \frac{13.44}{7} = 1.92 \quad (1)$$

From the results in Table 11, it can be observed that, statement "In the past four weeks how often were you or any household member have to eat some foods that you really did not want to eat because of a lack of to obtain other types of food" obtained a Mean of 2.16 (*SD*= .99). Also the statement "In the past four weeks how often were you or any household member have to eat a smaller meal than you felt you needed because there was not enough food" had a Mean of 2.07 (*SD*= .96). A greater percentage of the pregnant adolescents also favoured the statements "In the past four weeks how often were you or any household member have to eat fewer meals in a day because there was not enough food" (Mean = 1.972, SD = 0.75), "In the past four weeks how often were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources" (Mean = 1.91, SD = .68), "In the past four weeks how often did you worry that your household would not have enough food" (Mean = 1.82, SD = .94), "In the past four weeks how often were you or any household member had to eat a limited variety of foods due to a lack of resources." (Mean = 1.77, SD = 0.79), "In the past four weeks how often was there food to eat due availability of resources to get food" (Mean = 1.74, SD = 0.77). Judging from the overall mean (1.92), it can be inferred that pregnant adolescents have low food insecurity status. This is because the overall mean of 1.92 is less than the standard mean of 2.50. The result therefore means that pregnant adolescents in the Shama Districts have low food insecurity.

Research Question 2: What are the perceived factors contributing to food insecurity status of pregnant adolescents Shama District?

Research question also sought to explore the perceived factors contributing to food insecurity status of pregnant adolescents Shama District. To achieve the objective of this research question, pregnant adolescents were required to respond to items measured on a four-point Likert-type scale with 1- strongly disagree, 2- disagree, 3- agree and 4- strongly agree where 1 indicates the disagreement to the statement and 4 indicating the strongest agreement to the statements. Means and standard deviation were used to analyse the responses of the pregnant adolescents. In the analysis, mean values above 2.5 (1+2+3+4/4 =2.5) shows that majority of the pregnant adolescents agreed with the statement while a mean value below 2.5 shows that majority of the pregnant adolescents disagreed with the statement. A summary of the responses is presented in Table 12.

Table 12: Factors Contributing to Food Insecurity Status among Pregnant Adolescent's

	Statements	M	SD
1	The household size affects the rate food is consumed which affects food insecurity.	3.02	0.53
2	Not having enough food supplies often increase food insecurity among pregnant adolescents.	2.68	0.52
3	Not having stable income would prevent you to have frequent food supplies which increase food insecurity among pregnant adolescents.	2.66	0.52
4	Not having the entitlement to food in most cases affect food insecurity among pregnant adolescent.	2.47	0.52
5	Not eating at the appropriate time also affects food insecurity of the pregnant adolescent.	1.56	0.52
6	Not eating a balanced diet often increases food insecurity among pregnant adolescents.	1.54	0.51
7	The level of education also informs a person about the kind of food to eat as and when.	1.42	0.50

Source: Field survey (2021)

It can be observed from Table 12 that, majority of the pregnant adolescents agreed to the statement "The household size affects the rate food is consumed which affects food insecurity" (Mean = 3.02, SD = .76). A greater percentage of the pregnant adolescents also agreed that "Not having enough food supplies often increase food insecurity among pregnant adolescents" (Mean = 2.68, SD = 0.98), "Not having stable income would prevent you to have frequent food supplies which increase food insecurity among pregnant adolescents" (Mean = 2.66, SD = .95). Inferring from the responses of pregnant adolescents show that factors relating to "The household size affects the rate food is consumed which affects food insecurity", "Not having enough food supplies often increase food insecurity among pregnant adolescents" and "Not having stable income would prevent you to have frequent food supplies which increase food insecurity among pregnant adolescents" are the perceived factors causing food insecurity among pregnant adolescents in the Shama District. However, from Table 12 the statement "The level of education also informs a person about the kind of food to eat as and when" obtained a Mean of 1.42 (*SD*= 0.50) From the responses, it can be inferred that factors relating to the size of household, insufficient food supply and unstable income are the factors contributing to food insecurity among pregnant adolescents.

Research Question 3: **What are the perceived effects of food insecurity on the quality of life of pregnant adolescents in Shama District?**

This research question sought to also find out the effects of food insecurity on the health-related quality of life of pregnant adolescents in Shama District. In achieving the objective of this research question, Pearson

product moment correlation was used. The independent variable was food insecurity while the dependent variable was health-related quality of life. Health-related quality of life has two subscales: physical health and mental health. Therefore, Pearson product moment correlation was appropriate since effects of food insecurity on the health-related quality of life of pregnant adolescents can also be measured in terms of the relationship they have. Since the items were measure on the four-point Likert scale; 1= strongly disagree, 2= disagree, 3= agree, and 4= strongly agree, composite scores were calculated for each of the items of food insecurity and quality of life of pregnant adolescents before the conduct of the analysis. The research question was tested at .05 level of significance and 95% confidence level. The summary of the analysis is presented in Table 13.

Table 13: Relationship between Food Insecurity and Health-related Quality of Life of Pregnant Adolescents

		Food insecurity	Physical health	Mental health
Food insecurity	Pearson Correlation	1	-.576**	-.446**
	Sig. (2-tailed)		.000	.000
Physical health	Pearson Correlation	-.576**	1	-.485**
	Sig. (2-tailed)	.000		.000
Mental health	Pearson Correlation	-.446**	.485**	1
	Sig. (2-tailed)	.000	.000	

** Correlation is significant at the 0.05 level (2-tailed). N= 238

The results in Table 13 show that there is a moderate, negative and significant relationship between food insecurity and both dimension of health-

related quality of life in pregnant adolescents. From the results, food insecurity is negatively correlated with physical health dimension of health-related quality of life (r= -.576, $p < .01$), and was also negatively correlated with the mental health dimension of health-related quality of life (r= -.446, $p < .01$). The result means that an increase in the level of food insecurity leads to a decrease in the health-related quality of life of pregnant adolescents and the vice versa. This further implies that when food insecurity among pregnant adolescents is high, it has negative effect on their health-related quality of life.

Hypothesis

H_0: There is no statistically significant difference in perceived factors contributing to food insecurity status of pregnant adolescents Shama District with respect to their Economic Status.

This hypothesis sought to investigate whether statistically significant difference exists in perceived factors contributing to food insecurity status of pregnant adolescents in the Shama District with respect to their Economic Status. In achieving the purpose of this hypothesis, composite scores for the factors contributing to food insecurity status among pregnant adolescents were calculated and measured with their economic status which was made up of three categories such as Weak, Moderate and Good. One-way analysis of variance (ANOVA) was used to ascertain if significant differences exist in the factors contributing to food insecurity status of pregnant adolescents with respect to their Economic Status.

Before the analysis, all the conditions as well as the assumptions were adhered to and tested respectively. In checking the first condition which highlights that, the dependent variables should be measured on interval or ratio

scale (i.e. continuous), it must be established that, composite scores were obtained from items used to measure factors contributing to food insecurity status. The second condition which also state that the independent variable must consist of two or more categorical independent groups was also met since the independent variable is economic status with three levels namely; Weak, Moderate and Good.

Considering the assumptions, the normality test was conducted using Shapiro Wilk where the dependent variables were approximately normally distributed on the independent variables. Based on the assumptions of the Shapiro-Wilk test, it can be said that normality is assumed. Each of the categories (factors) has a statistic of 2.979, 2.909 and 2.972 ($p > .05$) respectively. Another important assumption which was tested for was the homogeneity of variance. In testing for this assumption, Levene's test for homogeneity was used. From the Levene's test, it was revealed that the variance were homogeneous (Levene's statistic= 2.71, $p > 0.05$).

With all the assumptions met, the ANOVA test was conducted. Summary of results from the ANOVA Test of within Subjects Effect is also provided in Table 14.

Table 14: ANOVA Test of Within Subjects Effect

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	225.671	2	112.335	9.260	.021
Within Groups	303.077	235	1.290		

Source: Field survey (2021).

From Table 14, there is a statistically significant difference in the factors contributing to food insecurity among pregnant adolescents with

respects to their economic status, F (2,235) = 9.260, $p < .05$. This explains that there are significant differences in the factors contributing to food insecurity among pregnant with respects to their economic status and that suggest that, the hypothesis that there is no statistically significant difference in perceived factors contributing to food insecurity status of pregnant adolescents Shama District with respect to their Economic Status is rejected in favour of the alternate hypothesis. A post hoc test was then conducted to find out where the differences existed among the groups of economic status. The summary of the post hoc test using Tukey's test is presented in Table 15.

Table 15: Multiple Comparisons

Economic Status	Economic Status	Mean Difference	Std. Error	Sig
Weak	Moderate	9.894*	3.773	.025
	Good	18.043*	4.131	.000
Moderate	Weak	-9.894*	3.773	.025
	Good	8.148	4.291	.041
Good	Weak	-18.043*	4.131	.000
	Moderate	-8.148	4.291	.041

*. The mean difference is significant at the 0.05 level.

From Table 15, there is a significant difference in mean scores between Weak and Moderate ($p < .05$) and between Good and Moderate ($p < .05$), as well as between Weak and Good ($p < .05$). In conclusion, the results indicate that perceived factors contributing to food insecurity status of pregnant adolescents differs with respect to their Economic Status within Shama District.

From the results so far, it can be observed that pregnant adolescents in the Shama Districts have low food insecurity. The results further showed that

factors relating to the size of household, insufficient food supply and unstable income are the perceived factors causing food insecurity among pregnant adolescents in the Shama District. More so, it was revealed that food insecurity has negative significant effect on the quality of life among pregnant adolescents. Lastly, the results further indicated that there are statistically significant differences in the factors contributing food insecurity status among pregnant adolescents with respect their economic status where the factors were high in pregnant adolescents with weak economic status.

Discussion of Findings

In this aspect of results, the findings of the study have been discussed. The discussion of the research findings was done in line with the following themes:

1. Food insecurity status among pregnant adolescents.
2. Factors contributing to food insecurity status among regnant adolescents.
3. Effects of food insecurity on the quality of life of pregnant adolescents.
4. Difference in factors contributing to food insecurity status among pregnant adolescents.

Food Insecurity Status among Pregnant Adolescents

The first research question sought to find out food insecurity status of pregnant adolescents in Shama District. The findings which emerged from this result communicate food insecurity among pregnant adolescents in the Shama Districts as low. Gathering from this, it can be stated that pregnant adolescents have access to the appropriate amount of food needed during pregnancy.

The findings of the study agree with the findings of Gholami et al. (2013) and that of Ijarotimi and Erota (2018) who focused on investigating the food insecurity of household and its nutritional implications for pregnant teenagers from selected local authorities in Lagos, Nigeria. Ijarotimi and Erota (2018) reported that the prevalence of food insecurity was mild (15.9%), moderate (8.0%) and severe (4.6%) in households, while the remaining families enjoyed food coverage. This means that a total percentage of 28.5% represents the food insecurity status of the pregnant adolescents which were used. The findings of the study are in consonance with the findings of Ijarotimi and Erota (2018) since both findings have reported low food insecurity status among pregnant teenagers. The findings of the study are again consistent with the findings of Moafi, Kazemi, Siboni and Alimoradi (2018) who investigated the relationship between the health-related Quality of Life during pregnancy among pregnant adolescents and their household food insecurity status. Their findings reported that with regards to the food insecurity status of pregnant adolescents, 56.1% of the pregnant adolescents were in a food secure status, but 43.9% of them experienced mild to severe food insecurity. The consistencies the findings of this study and other previous studies like the work of Ijarotimi and Erota (2018) and Moafi et al. (2018) can be associated to the similarities in research participants; as all these studies focused on pregnant adolescents. It is likely that similarities in the various factors examined account for consistencies in the findings of this study and other previous studies.

The findings of the study however disagree with the findings of Obayelu (2012) who examined the food insecurity status among households of

pregnant teenagers in Nigeria. Obayelu's findings revealed that only 16% of the households of pregnant teenagers were food secure (FS), 36% food insecure without hunger, 28% FS with moderate hunger and 21% food insecure with severe hunger. Comparing the percentages, pregnant teenagers recording 36% suggest that majority of the pregnant teenagers used for the study were food insecured. Obayelu's findings are in disagreement with the findings of this study since the findings of the study have reported low food insecurity among pregnant adolescents as against Obayelu's findings who have reported otherwise. This might have happened as a result of differences in the characteristics of pregnant adolescents or teenagers which were used in both studies. Again, the findings of the study are in disagreement with the findings of Kazemi, Masoumi, Shayan and Yasaghi (2020) who conducted a study on the prevalence of food insecurity in pregnant adolescents and its association with gestational weight gain pattern, neonatal birth weight, and pregnancy complications in Hamadan County in Iran. Their findings reported a high prevalence of food insecurity in pregnant adolescents. The findings of this study disagree with the findings of Kazemi et al. (2020) since both studies have reported different findings with regards to food insecurity among pregnant adolescents. This is because whiles the findings of this study have reported low food insecurity among pregnant adolescents, Kazemi et al. (2020) have reported otherwise.

A study conducted by Seidu et al. (2020) which sought to assess food insecurity among pregnant adolescents in Ghana also disagrees with the findings of the study. This is because Seidu et al. (2020) reported that 57.8% of pregnant adolescents had experienced food insecurity which indicated a

high prevalence of food insecurity among pregnant adolescents. Both findings are in disagreement since they have reported differences in findings. The findings of this study have reported low food insecurity among pregnant adolescents as compared to the findings of Seidu et al. (2020) who have reported otherwise. Although both studies were conducted in Ghana, there are differences in the findings. These differences can be associated to the discrepancies in the study population and the sample. Seidu et al. (2020) for instance studied 1,266 in-school adolescents; however this study specifically focused on pregnant adolescents in the Shama District of the Western region of Ghana. It is possible that these factors accounted for the differences in the findings.

Factors Contributing to Food Insecurity Status among Regnant Adolescents

The second research question also sought to explore the perceived factors contributing to food insecurity status of pregnant adolescents Shama District. The findings from this research question showed that factors relating to the size of household, insufficient food supply and unstable income are the perceived factors causing food insecurity among pregnant adolescents in the Shama District.

The findings from this research question partially corroborates with the findings of Drammeh, Hamid and Rohana (2019) who focused on determinants of household food insecurity and its association with child malnutrition in Sub-Saharan Africa. The findings indicated that gender of the household head of the adolescent; age, educational status, household size, income, poverty and food price were the main determinants that contributes to

household food insecurity and lead to child malnutrition and food insecurity among pregnant teenagers in Sub-Saharan Africa. The findings of this study are in consonance with the findings of Drammeh et al. (2019) since both findings have indicated household size and income as the factors contributing to food insecurity. Again, the findings of the study agree with that of by Moafi, Kazemi, Siboni and Alimoradi (2018) who investigated the household food insecurity and related dietary and socioeconomic factors for pregnant teenagers in Asia. The results of their study revealed that factors such as household size, respondents' level of education, grooms' level of education, husband employment and income per month contributes to food insecurity among households. The findings of this study are in agreement with the findings of Moafi et al. (2018) because both findings have reported household size and status of income as factors contributing to food insecurity. The similarities in the findings can be related to similarities in the sample since the studies of Moafi et al. (2018) and Drammeh et al. (2019), and this study specifically focused on pregnant adolescents.

However, the findings of the study disagree with findings obtained from the study conducted by Abdirahman (2019). Abdirahman (2019) reported that low level of education and low level of nutrition knowledge are the factors causing food insecurity. It is clear that the two findings are in consonance since they have reported differences in findings. Whiles the findings of this study have reported household size, insufficient food supply and unstable income as factors contributing to food insecurity, Abdirahman have reported that low level of nutrition knowledge as the main factors causing food insecurity.

Effects of Food Insecurity on the Quality of Life of Pregnant Adolescents

The third research questions sought to find out the effects of food insecurity on the quality of life of pregnant adolescents in Shama District. The findings indicated that food insecurity has negative significant effect on the quality of life among pregnant adolescents. This finding further means that an increase in the level of food insecurity leads to a decrease in quality of life of pregnant adolescents.

A study conducted by Darmo and Caillavet (2017) focused on the effect of food insecurity on a household level of pregnant teenagers in developed countries. The study also focused on two issues: the individual determinants of food insecurity, and the impact of food insecurity on quality of life. Their study revealed that food insecurity is linked and has significant effect on poor quality of life at all ages. Darmo and Caillavet's findings are consistent with the findings of this study since both studies have reported a significant effect of food insecurity on quality of life among pregnant adolescents or teenagers. Similarly, the findings of this study agree with finding reported by Diddana (2019) which indicated that poor quality of life which came with food insecurity was significantly associated with under nutrition.

Additionally, in another study conducted by Abdirahman (2019) which investigated the nutrition knowledge, dietary practices and quality of life of pregnant adolescents have also reported consistencies with the findings of the study. This is because Abdirahman's findings reported a significant relationship between the dietary diversity and quality of life. Abdirahman further reported that the poor quality of life was associated with food

insecurity and frequent illness. The two findings are in agreement since both have proved a significant effect or relationship between quality of life and food insecurity.

Factors Contributing to Food Insecurity Status among Pregnant Adolescents with Respect to Their Economic Status

Another objective of this study was to investigate whether statistically significant difference exists in perceived factors contributing to food insecurity status of pregnant adolescents based on their socio-economic Status. The findings which emerged from the hypothesis indicated that there are statistically significant differences in food insecurity status among pregnant adolescents with respect to their economic status where the factors were high in pregnant adolescents with weak economic status. The findings of this study are consistent with the findings of Carter, Lanumata, Kruse and Gorton (2010) who investigated the demographic and socio-economic status determinants of food insecurity in New Zealand. Their findings reported that the socio-economic status such as worse self-rated health status, renting, being unemployed and income was the strongest predictor of food insecurity among teenagers. The findings of this study agree with the findings of Carter et al. (2010) because the study have reported difference in the factors contributing to food insecurity with respect to the economic status of pregnant adolescents which is in line with the findings reported by Carter, et al. (2010) who reported predictors of food insecurity status based on socio-economic status comprising of self-rated health status, renting, being unemployed and income.

Again, the findings of the study are in agreement with the findings of Yadegari, Dolatian, Mahmoodi, Shahsavari, and Sharifi (2017) who have

reported a significant relationship between socio-economic status of the teenager and food insecurity. They further reported that teenagers with poor economic status had higher odds of having food insecurity as compared to pregnant teenagers with good economic status. This is an indication that differences exist in factors or determinants of food insecurity based on socio-economic status of pregnant adolescents.

In Ghana, Seidu (2015) have also reported an influence of socio-economic status comprising of level of education, income, and access to finance on food insecurity status of pregnant teenagers. This confirms and support the findings obtained from this study since it was revealed that differences exist in the factors or determinants of food insecurity status of pregnant adolescents where the factors or determinants of food insecurity were high among pregnant adolescents with weak economic status.

Chapter Summary

This chapter dealt with the analyses of data and presented the results and discussion of findings. Various findings were made. It was found that food insecurity among pregnant adolescents in Shama District was low. Household size, insufficient food supply and unstable income were among factors that contribute to food. Furthermore, it was revealed that food insecurity has a negative impact on the health-related quality of life of pregnant adolescents. Finally, there was a significant difference in the level of food insecurity with regards to the perceived socio-economic status of pregnant adolescents. Findings were discussed in relation to the literature reviewed. Conclusions and recommendations are presented in the next chapter.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This is the concluding chapter of the study. It summarizes the study highlighting the methodologies adopted in collecting and analysing data so as to come out with the main findings in addressing the research questions and hypothesis formulated on food insecurity status among pregnant adolescent in the Shama District. Based on the main findings, conclusions are reached to permit the provision of appropriate recommendations as well as suggestions for further studies.

Summary

The research was undertaken to determine food insecurity status of pregnant adolescents in Shama District, examine the factors perceived to be contributing to food insecurity status of pregnant adolescents, determine the perceived effects of food insecurity on the quality of life of pregnant adolescents and determine whether there is a significant difference in perceived factors contributing to food insecurity status of pregnant adolescents in the Shama District with respect to their Economic Status.

The following research questions guided the study:

1. What is the food insecurity status of pregnant adolescents in Shama District?
2. What are the perceived factors contributing to food insecurity status of pregnant adolescents Shama District?
3. What are the perceived effects of food insecurity on the quality of life of pregnant adolescents in Shama District?

The hypothesis developed for the study was:

H_0: There is no statistically significant difference in perceived factors contributing to food insecurity status of pregnant adolescents Shama District with respect to their Economic Status.

The study employed descriptive research design using the questionnaire as the only instrument to collect the relevant data in addressing the research questions formulated for the study. In selecting the samples for the study, Krejcie and Morgan (1970) table for determining sample size was used to arrive at 238 pregnant adolescents selected through proportionate and convenient sampling techniques. Both descriptive and inferential statistics were used to analyse the data. Specifically, for the descriptive statistics consisting of percentages and frequencies used to analyse the demographic characteristics of the respondent, the mean and standard deviation for research question one and two and for the inferential statistics, Person Product Moment Correlation as well as One-Way ANOVA were used to analyse research question three and the hypothesis respectively.

Key Findings

The key findings are outlined in consonance with the objectives of the study as follows:

1. The first objective investigated food insecurity status of pregnant adolescents in Shama District. The key findings were that pregnant adolescents in the Shama Districts have low food insecurity
2. The second research objective was to explore the factors perceived to be contributing to food insecurity status among pregnant adolescents. The key findings that emerged were that, factors relating to: (a) the

size of household (b) Insufficient food supply and (c) Unstable income are the major perceived factors causing food insecurity among pregnant adolescents in the Shama District

3. The third research objective sought to assess the perceived effects of food insecurity on the quality of life of pregnant adolescents. The key findings were that, food insecurity has negative and significant effect on the quality of life among pregnant adolescents
4. The fourth objective sought to determine whether there is a significant difference in perceived factors contributing to food insecurity status of pregnant adolescents in the Shama District with respect to their Economic Status. The key findings were that there are statistically significant differences in the factors contributing food insecurity status among pregnant adolescents with respect their economic status where the factors were high in pregnant adolescents with weak economic status.

Conclusion

Based on findings, the following conclusion could be made:

1. Pregnant adolescents within the Shama districts have low food insecurity. This means that pregnant adolescents within Shama District have enough and right quantity of food to eat and therefore have low food insecurity, according to the ranking.
2. Factors such as the size of household, insufficient food supply and unstable income contribute to the food insecurity status of pregnant adolescents within the Shama District.

3. There is a negative and significant effect of quality of life on the food insecurity status among pregnant adolescents within the Shama District. Based on this, it can be concluded that food insecurity leads to poor health in the expectant mother and thus low quality of life.
4. Socio-economic status can have an effect on food security. The pregnant adolescent is likely to suffer food insecurity during lean or off season when income levels of the household is low and not sufficient.

Recommendations

In view of the above research findings and the conclusions, the following recommendations are made:

1. Although the study found that pregnant adolescents within the Shama District had low food insecurity, family members, healthcare providers should educate and encourage them to continue to increases their food security since that can be of great benefits to their unborn babies.
2. Local government authorities should provide some support in terms food or income to those from large families and household, weak income backgrounds, and those with insufficient food supply to help them improve their food security status.
3. Healthcare providers should provide nutritional information and education to pregnant adolescents since proper nutrition influences the health-related quality of life.
4. It is also recommended that adolescent mothers should engage themselves in income generating skills and trades to enable them

maintain a good socio-economic status; this would help them improve their food security.

Suggestions for Further Research

To further extend the research on examining food security status among pregnant adolescent in the Shama District, the following suggestions are provided for further studies:

1. Since this study focused on pregnant adolescents in the Shama District, it is recommended that additional studies of this nature should be conducted in other parts of Ghana in order reach a nationwide generalisation.
2. Future researchers can also consider using mixed method design in order to give an in-depth understanding of the study variables. This is because this study only used a quantitative approach which did not provide ample in-depth knowledge on how food insecurity really affects adolescent mothers.

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APPENDICES

APPENDIX B

QUESTIONNAIRE

UNIVERSITY OF CAPE COAST

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION

QUESTIONNAIRE FOR RESPONDENTS

This questionnaire is purely designed for academic work and is intended to examine food insecurity among pregnant adolescent in the Shama District. It is the hope of the researcher that you will give the best answer to facilitate the work. Be assured that any information given will be treated with high sense of confidentiality.

INSTRUCTIONS

Please put a check mark (√) where appreciable in the box corresponding to your choice concerning each statement. The information given will be used only for academic purpose. Your identity remains confidential.

SECTION A: DEMOGRAPHY OF RESPONDENTS

1. Age of Respondents

(a) 10-13 [ ]

(b) 16-19 [ ]

2. Level of Education

(a) No formal education [ ]

(d) Primary education [ ]

(b) Secondary education [ ]

3. Residency

(a) Rural [ ]

(b) Urban [ ]

4. Perceived Economic Status

(a) Weak [ ]

(b) Moderate [ ]

(c) Good [ ]

5. Number of Pregnancies

(a) 1 [ ]

(b) 2 [ ]

(c) >2 [ ]

SECTION B: FOOD INSECURITY STATUS OF PREGNANT ADOLESCENTS IN SHAMA DISTRICT.

INSTRUCTIONS

Tick (√) the appropriate option that corresponds with your answer to the following questions. Supplied also are four options corresponding to these statements.

Never (N) Rarely (R) Sometimes (S) Often (O)

No.	**STATEMENTS**	**N**	**R**	**S**	**O**
6	In the past four weeks how often did you worry that your household would not have enough food.				
7	In the past four weeks how often were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources.				
8	In the past four weeks how often were you or any household member had to eat a limited variety of foods due to a lack of resources.				

9	In the past four weeks how often were you or any household member have to eat some foods that you really did not want to eat because of a lack of to obtain other types of food.				
10	In the past four weeks how often were you or any household member have to eat a smaller meal than you felt you needed because there was not enough food				
11	In the past four weeks how often were you or any household member have to eat fewer meals in a day because there was not enough food?				
12	In the past four weeks how often was there food to eat of any kind in your household due availability of resources to get.				

SECTION C: PERCEIVED FACTORS CONTRIBUTING TO FOOD INSECURITY STATUS OF PREGNANT ADOLESCENT SHAMA DISTRICT

Tick (√) the appropriate option that corresponds with your answer to the following questions. Supplied also are four options corresponding to these statements. Strongly agree **(SA),** Agree **(A),** Disagree **(D),** and Strongly Disagree **(SD**).

No	**STATEMENTS**	**A**	**SA**	**D**	**SD**
13	Not having enough food supplies often increase food insecurity among pregnant				

	adolescents				
14	Not having stable income would prevent you to have frequent food supplies which increase food insecurity among pregnant adolescents.				
15	Not eating a balanced diet often increases food insecurity among pregnant adolescents				
16	The household size affects the rate food is consumed which affects food insecurity				
17	The level of education also informs a person about the kind of food to eat as and when				
18	Not eating at the appropriate time also affect food insecurity of the pregnant adolescent				
19	Not having the entitlement to food in most cases affect food insecurity among pregnant adolescent				

SECTION D: HEALTH-RELATED QUALITY OF LIFE OF PREGNANT ADOLESCENT IN SHAMA DISTRICT

Tick (√) the appropriate option that corresponds with your answer to the following questions. Supplied also are four options corresponding to these statements.

SA (Strongly Agreed) A (Agreed) D (Disagreed) SD (Strongly Disagreed)

	Statements	**1**	**2**	**3**	**4**
20	I can perform moderate activities				
21	I am able to climb several flights of stairs				
22	I accomplish less than what I would like				
23	I am limited in the kind of work or activities to do				
24	Severe pain interferes with normal work				
25	In general, my health is good				
26	I have a lot of energy				
27	My physical health and emotional health interferes with my social activities				
28	I accomplish less than what is required of me				
29	I work and do other activities more carefully				
30	I feel calm and peaceful				
31	I feel sad and depressed				

THANK YOU