UNIVERSITY OF EDUCATION, WINNEBA

FOOD TABOOS AND COMMON BELIEFS ASSOCIATED WITH PREGNANT WOMEN IN KASOA ZONGO COMMUNITY IN THE CENTRAL REGION OF GHANA

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DECLARATION

Student's Declaration

I, AMIDATU YAKUBU, hereby declare that this thesis with the exception of references and quotations contained in published works which have all been identified and duly acknowledged 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.

Signature……..……..…….……

Date…….…..……

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation was supervised in accordance with the guidelines on supervision of dissertations laid down by University of Education, Winneba

Name of Supervisor: Dr. Faustina Yaa Amoako-Kwakye

Signature……..……..…….……..……

Date…….…..……

DEDICATION

I dedicate this work to my family, especially my husband Sheikh Osumanu Jibililu for his love and support, to my parents and role models Mr. Alhaji Yakubu Nuhu and Mrs Wardatu Shaibu for their love care and support. I also dedicate this work to my children Anisah and Fadlullah.

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ACRONYMS

ANC	Ante Natal Care
BMI	Body Mass Index
EDH	Ethiopian Demographic and Health Survey
FAO	Food and Agriculture Organization of the United Nations
ENGIENE	Empowering New Generations to Improve Nutrition and Economic opportunities
FGD	Focus Group Discussion
GWG	Gestational Weight Gain
IOM	Institute of Medicine, American
Km	Kilometer
OR	Odds Ratio
PTB	Pre-term Birth
RDA	Recommended Dietary Allowance
RR	Relative Risk
SES	Socio- economic status
SPRING	Strengthening Partnership, Result, and Innovations in Nutrition Globally
SPSS	Statistical Package for Social Science
WHO	World Health Organization

ABSTRACT

The purpose of the study was to investigate the prevalence and adherence to food taboos associated with pregnancy in the Kasoa-Zongo community. The study employed descriptive cross-sectional survey, specifically, mixed-methods and combination of purposive, snowballing, and convenience sampling methods were used to select 106 respondents for the study. A structured questionnaire, with both closed- and open-ended items were used for data collection and analysed using SPSS version 20 by descriptive and inferential analyses. The results were presented by tables and frequencies. Key findings were that snails, ripe plantains, mushrooms, pork, eggs, mudfish, groundnuts, python, and tortoise formed some of the pregnancy-related tabooed foods avoided by the pregnant women in the study area. Religious belief, foods being spiritually unwholesome, ancestral taboo prevention of miscarriage, deformity, prolonged labour, allergies and depression were some of the major reasons for adhering to food taboos during pregnancy. Over half of the pregnant women had good or fair knowledge of nutrition issues and adherence to food taboos was relatively more prevalent and higher among pregnant women with low levels of education compared to their counterparts with higher educational levels. It is recommended that education on nutrition during pregnancy should be intensified in all communities.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

What one society considers as standard or even highly desirable, another society may deem revolting or completely disgusting. Animal milk is generally consumed and liked by many people in Africa, Asia, Europe and the Americas, but rarely taken in China. Similarly, crabs, lobsters and shrimps are usually considered as highly esteemed delicacy foods by many people in Europe and North America, but are nauseating or disgusting to many people in Asia and Africa, particularly those who live far from the sea (Chilton, Burton, Reid, & Reid, 2015). Consequently, in Ghana like any other country, many people delightedly eat the flesh of dogs, monkeys, snakes, rats or even insects, however many others find these foods most unpleasantly disgusting. Religions do play a significant role in forbidding the consumption of certain foods. Thus, Muslims, Jews and even some Christians do not consume pork, and Hindus do not have beef and are habitually vegetarians (Chilton, Burton, Reid, & Reid, 2015).

Customs and food habits which have been followed for years may not be necessarily good. Due to ignorance, poverty, superstition and religion among other factors; people tend to eat whatever they lay hands on (Specker, 2015). The resultant effect is malnutrition which most pregnant women are prone to, that is, they are vulnerable. According to UNICEF (2009), every year, more than half a million women die from mortality and childbirth complications as well as nearly four million new born babies die within 28 days of birth. Furthermore, according to UNICEF (2009), millions of new-borns suffer from diseases, disabilities, infections and injuries due to pregnancy and childbirth complications. These lifetime menaces of maternal complication for a

woman are very common in the developing countries (UNICEF, 2009). Asia and Africa account for about 95% of the world's maternal health problems, with predominantly high burdens in Sub-Saharan Africa which accounts for 50% as well as South Asia with about 3% (Parks, 2007).

Patil, Vedapriya, Khan, Iqbal and Raghavi, (2010) posit that people whether living in the rural or urban areas have their own beliefs and practices, these beliefs might be based on centuries of trial and error. Some of these beliefs may possibly be useful while others are harmful (Parks, 2007). However, Meyer-Rochow (2009) and Purnamasari (2010) suggests that some of these beliefs and practices might be related to food that should be eaten by members of the society, ethnicity, culture or faith. Whereas some foods are demanded for consumption by a particular group of people for health purpose, others are not (Meyer-Rochow, 2009; Purnamasari, 2010).

Foods that are restricted are usually referred to as food taboos. Purnamasari (2010) believes food taboos can be termed as the actions to stay away from certain foods based on some fundamental explanation which may be logical, supernatural, religious or sometimes difficult to explain rationally. More so, Whitehead (2010), referred to food taboos as part of a complex attitudes relating to the sense of taste, feelings and abstentions which are concerned in the creation and maintenance of cultural differences, male authority and gender inequalities. To Fontana, Partridge, and Longo, (2010), food taboos could either have positive or negative effects on humans. For example, certain depression and allergies are associated with the consumption of certain foods, therefore, these foods are usually declared as food taboos to protect the health safety of individuals who might consume it (Meyer-Rochow, 2009). To all intents and purposes, such food taboos have a positive consequence on individuals.

However, negatively, food taboos may possibly undermine the health and nutritional needs of people particularly the vulnerable in the society (Azumah, 2010).

A taboo may be followed by a whole national group, tribe, part of a tribe or by certain groups in the society. Geddavalasa (2013) suggests that there are different food customs that may be practiced by women or children within a society, or by pregnant women or female children. However, in certain instances, traditional food customs are practiced by a particular age group, occupation or imposed on individuals to curb the outbreak of a viral disease; or for a particular event such as an initiation ceremony of a king or a traditional authority (Azumah, 2010).

Taboos and misconceptions during pregnancy have been part of Ghanaian cultures since centuries. According to Ali and Azim (2016), the avoidance of certain foods and the incorrect knowledge regarding its benefits can deprive women from adequate nutrition. A balanced and adequate diet is therefore of utmost importance during pregnancy to meet the increased needs of the mother and the foetus, and to prevent nutritional stress. In various studies, it was seen that pregnant women in various parts of the world are forced to abstain from nutritious foods as a part of their traditional food habits (Maduforo, 2010). During pregnancy, the nutritional necessities of women increase to support the optimum foetus growth and development. Poor maternal nutrition during pregnancy usually may results in birth complications, miscarriages, pregnancy anaemia, low birth weight, still birth, and high pre–natal and infant mortality (Marangoni, Cetin, Verduci, Canzone, Giovannini, Scollo, Corsello & Poli, 2016).

Kasoa-Zongo community is a heterogeneous community with inhabitants of various ethnic groups, religious background, educational and socio-economic background. This may all affect the food they choose to eat. However, the body needs nutrients in food to enable it function properly. In cases where some nutrients are not adequately provided deficiencies result and morbidity and in the ultimate, mortality set in. Thus, it becomes necessary to find alternatives that will provide the limited nutrients to support life. The situation even becomes more serious in cases where pregnant women are prohibited from consuming certain foods. In such situations, both the women and the developing foetus may have to suffer health problems as a result of nutrient inadequacies (Maduforo, 2010). For the sake of the lives of the expectant mothers and their unborn babies, pregnancy related food taboos have to be identified, examined to see if what the women and their unborn babies will be losing if the taboos are adhered to and find measures to make up for any nutritional inadequacies as a result of adherence. Food taboos have been identified as one of the factors contributing to maternal under nutrition in pregnancy. The question that arises is which pregnancy related food taboos exist and are adhered to among the residents of Kasoa Zongo community?

1.2 Statement of the Problem

The prevalence of Malnutrition among pregnant women in the rural community of Ghana poses a great challenge to nutritionist and the health sector as well as to the Government of Ghana (Ghana Health Service, 2015). Besides, there is more to be done in terms of achieving the sustainable development Goals 3, which target reducing the global maternal mortality ratio to less than 70 per 100,000 live births by 2030 (United Nations, 2019). Malnutrition has ranked high as the major cause of maternal mortality, and it is a major determinant of a successful pregnancy and a

healthy well-nourished baby (Yetunde & Olubukunola, 2015). Indeed, malnutrition of the mother does not just affect the pregnant woman only, but also has a devastating effect on the foetus (unborn child) (State of the World's Mothers, 2012). A casual discussion with the health personnel of the Kasoa Polyclinic revealed from the home units and Outpatient reports that most pregnant women do not eat adequate food, whereas others avoid foods that would improve their nutritional status, and this has predisposed most pregnant women and foetuses to poor foetal formation, miscarriage and anaemic conditions in pregnancy.

Over the years, it has also been observed that pregnant woman of developing countries (including Ghana) have been losing their pregnancy, having birth defects and even losing their lives. In most cases the women are said to be bewitched by the old women in the families. Their trusts and beliefs are rooted in culture, traditions and fetishism (Malla, Giri, Karki & Chaudhary, 2011). This has become a worrying threat which affects the women in the various countries when they are pregnant (Yetunde & Olubukunola, 2015). That notwithstanding, the Government has shown commitments by putting in resources to improve health infrastructure and a number of interventions to improve maternal healthcare within the country. This includes the following: The implementation of free maternal health services, repositioning family planning and training as well as repositioning reproductive and child health staff; the intensive training for midwives on the specific use of partograph. Knowledge in the use of partograph promotes confidence, reduces prolonged labour, caesarean sections and intrapartum still births; The High Impact Rapid Delivery (HIRD) approach is also being implemented as a complementary strategy to reduce maternal and child mortality. Several districts including Awutu Senya East- Kasoa have indicated progress in service indicators achieved and innovative strategies implemented with

regard to improving maternal health; Other interventions also include Ghana VAST Survival Programme, Prevention of Maternal Mortality Programme (PMMP), and Safe-Motherhood Initiative. There are also projects such as Making Pregnancy Safer Initiative, Prevention and Management of Safe Abortion Programme, Maternal and Neonatal Health Programme and Roll Back Malaria Programme, Intermittent Preventive Treatment (IPT); and Emergency Obstetric and Neonatal Care (EmONC) that are being implemented in all 10 regions of Ghana, but not yet with full complement of required resources (midwives, equipment) (Ghana Health Service, 2015).

Despite these numerous health interventions and the educational activities on nutrition and healthy living given to pregnant women at ante-natal care clinics in Ghana, some pregnant women have still been battling nutritional problems regardless of age, marital status, economic and educational backgrounds (Edusei, Bentum & Nkum, 2014). Even though pregnant women are given antenatal and post-natal clinics education, the problems associated with pregnancy food-related taboos challenges still persist (Ugwa, 2016). A situation where education is given yet the problem persists leaves a lot of questions unanswered. It is for this reason that an investigation into food taboos and common beliefs associated with pregnant women in Kasoa Zongo community in the central region of Ghana was conducted.

1.3 Purpose of the Study

The purpose of this study was to investigate the prevalence and adherence to food taboos associated with pregnancy in the Kasoa-Zongo community.

1.4 Objectives of the Study

The following objectives guided the study:

1. Identify food taboos and beliefs associated with pregnancy in Kasoa-Zongo community.
2. Investigate the level of adherence to food taboos by pregnant women in the community.
3. Examine the nutrition knowledge of pregnant women in the community.
4. Examine the alternative foods the pregnant women consume to replace the tabooed foods.

1.5 Research Questions

The following questions were formulated to aid the attainment of the study‘s purpose and objectives:

1. What are some of the food taboos and beliefs associated with pregnancy in Kasoa-Zongo community?
2. To what extent do the pregnant women in the community adhere to the food taboos?
3. What is the level of knowledge on nutrition of the pregnant women in the community?
4. What are the alternative foods the pregnant women consume to replace the tabooed foods?

1.6 Hypotheses

The following hypotheses were formulated to guide the study:

Ho_1: There is no significant relationship between the educational level of the pregnant women and compliance to food taboos.

Ho_2: There is no significant relationship between the religion of the pregnant women and adherence to food taboos.

Ho_3: There is no significant relationship between the educational level of the pregnant women and their level of knowledge on nutrition.

Ho_4: There will be no significant relationship between the ages of the pregnant women and adherence to food taboos.

Ho_5: There will be no significant relationship between the stages ofpregnancy of the pregnant women and adherence to food taboos.

1.7 Significance of the Study

This study would enable the Ministry of Health to make viable policies and provide nutritional intervention programmes for pregnant women. It would enable health centres to identify tabooed foods for pregnant women, and to find means of helping them to eat alternative diets that promote their health and growth of the foetus. It would also benefit pregnant women as well as prospective pregnant women who might use the recommended alternative foods or diets and supplements since they both have to be well-nourished in order to give birth to healthy babies. It is hoped that the study report if utilised would fill the gap in literature on food taboos associated with pregnancy since much has not been documented in Ghana. It would again serve as a reference material for those who would conduct similar research in future.

1.8 Delimitation of the Study

The research was carried out in Kasoa-Zongo community in the Central Region of Ghana. The pregnant women, health providers, and traditional health providers in the Kasoa-Zongo constituted the sample of the study. This study focuses on food taboos associated with pregnancy only. It did not cover food taboos linked to illnesses, cultural and religious practices of the people in general.

1.9 Organization of the Study

The study is organized into five chapters. Chapter One, which is the introduction, deals with background to the study, statement of the problem, purpose and objectives of the study, research questions, hypotheses, significance of the study, delimitation of the study, limitations of the study, and organization of the study. Chapter Two captures literature review. Chapter Three, which is the methodology, contains the research design, area of the study population, sample size and sampling techniques, instrumentation, validity and reliability of instruments**,** procedures for data collection, data analysis, and ethical considerations. Chapter Four also deals with results and discussion.

Chapter Five gives summary of the study, conclusions and recommendations. This chapter also makes suggestions on relevant areas for further studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section reviews other relevant studies done on food taboos and their beliefs around the world. The review is done under the following headings, including, theoretical framework, conceptual framework, food taboos and beliefs associated with pregnancy in women, adherence to food taboos by pregnant women, nutrition knowledge of pregnant women, and summary of literature review.

2.2 Theoretical Framework

A theory is defined as a set of interrelated concepts, assumptions and generalizations that systematically describes and explains behaviour (Watts, & Stenner, 2012). Therefore, a theory attempts to fit relevant facts into a logical explanation and also serves as a framework for collecting more information. Three theoretical approaches underpin this study in attempts to explain dietary habits: Maslow's (1943) hierarchy of needs, Theory of Planned Behaviour (TPB) by Ajzen (1991), and the Theory of Reasoned Action (TRA) by Ajzen and Fishbein (1980).

Maslow's hierarchy are physiological needs, safety needs, belongingness and love needs, esteem needs, and the need for self-actualization (Reid-Cunningham, 2008). Maslow (1943) described the body's physiological need for food, especially in terms of maintaining homeostasis of water, salt, macronutrients, vitamins, minerals, and temperature within the bloodstream. He elaborated, *"Undoubtedly these physiological needs are the most pre-potent of all needs…If all the needs are unsatisfied, and the organism is then dominated by the physiological needs, all other needs may become simply non-existent or be pushed into the background…for consciousness is almost*

completely pre-empted by hunger. For the chronically and extremely hungry man…life itself tends to be defined in terms of eating, and anything else will be defined as unimportant" (pp. 373-374). While Maslow's hierarchy offers an exposition on food, it also raises some fundamental questions: What must be consumed to meet basic physiological needs? and how do food taboos conflict with the food needs of a pregnant woman?

According to Ajzen (2011), the Theory of Planned Behaviour (TPB) was developed in 1991, based on the Theory of Reasoned Action. The theory of planned behaviour is often used to explain behaviour in general (Fielding, McDonald, & Louis, 2008; Sommer, 2011). It has to be noted that the TPB is not a behavioural change theory, but was developed to predict and understand behaviour. These theories were adopted because of their influence on human behaviour and attitude vis-à-vis food consumption.

According to Ajzen (2011), a behavioural intention is the most proximal determinant of behaviour; this intention, in turn, is shaped by a person's evaluation of the behaviour (attitude), their perception of social pressure to perform the behaviour (subjective norm), and their perceived controllability of the behaviour, that is Perceived Behavioural Control (PBC). These motivational factors, Ajzen's theory suggests, are themselves a function of behavioural beliefs, or expected outcomes of the behaviour; normative beliefs, which reflect the perceived extent of close referents' approval of the behaviour; and control beliefs. Morris (2011) suggested that the Control beliefs represent factors that facilitate or inhibit the performance of the behaviour, which are generally external to the person (Fielding, McDonald, & Louis, 2008). Cameron, Ginsburg, Westhoff, and Mendez (2012) stated that self-efficacy is

distinct from Perceived Behavioural Control (PBC) insofar as self-efficacy reflects a person‘s perception of internal control over behaviour. Concerning its relationship with food taboos and eating habits of pregnant women practices, these scholars considered that intentions might be affected not only by external, uncontrollable factors (PBC), but also by a person‘s perception of their expected benefits from compliance or adherence to food taboos (self-efficacy). That notwithstanding, Armitage and Conner (2001) outlined six constructs that collectively represent a person's actual control over the behaviour.

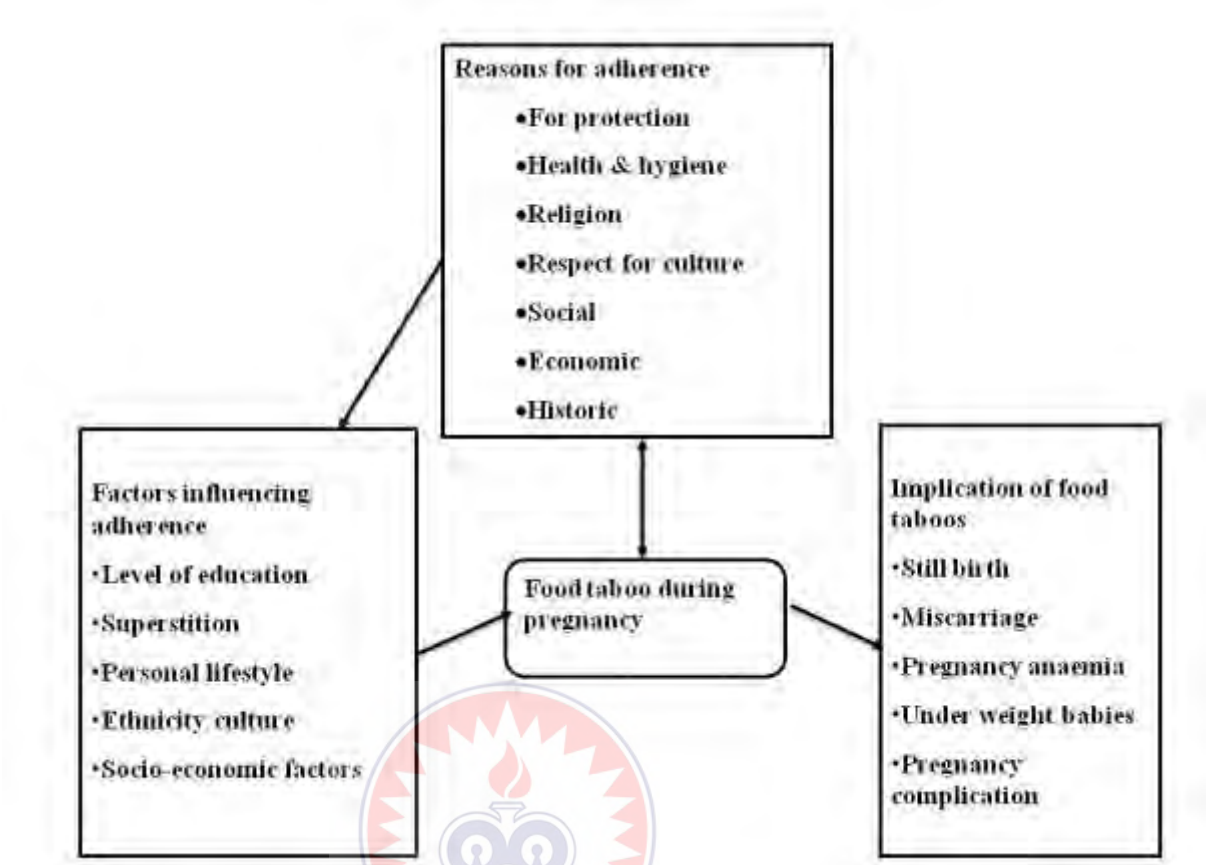
a. Attitudes - This refers to the degree to which a person has a favourable or unfavourable evaluation of the behaviour of interest. It entails a consideration of the outcomes of performing the behaviour.
b. Behavioural intention - This refers to the motivational factors that influence a given behaviour where the stronger the intention to perform the behaviour, the more likely the behaviour will be performed.
c. Subjective norms - This refers to the belief about whether most people approve or disapprove of the behaviour. It relates to a person's beliefs about whether peers and people of importance to the person think he or she should engage in the behaviour.
d. Social norms - This refers to the customary codes of behaviour in a group or people or larger cultural context. Social norms are considered normative, or standard, in a group of people.
e. Perceived power - This refers to the perceived presence of factors that may facilitate or impede the performance of a behaviour. Perceived power contributes to a person's perceived behavioural control over each of those factors.

f. Perceived behavioural control - This refers to a person's perception of the ease or difficulty of performing the behaviour of interest. Perceived behavioural control varies across situations and actions, which results in a person having varying perceptions of behavioural control depending on the situation. This construct of the theory was added later, and created the shift from the Theory of Reasoned Action to the Theory of Planned Behaviour.

The theory of planned behaviour (TPB) is intended to explain all behaviours over which people have the ability to exert self-control. The key component to this model is behavioural intent; behavioural intentions are influenced by the attitude about the likelihood that the behaviour will have the expected outcome and the subjective evaluation of the risks and benefits of that outcome (Xiao, Bai & Huang, 2014). The TPB has been used successfully to predict and explain a wide range of health behaviours and intentions including smoking, drinking, health services utilization, breastfeeding, and substance use, among others like HIV/STD-prevention behaviours and use of contraceptives, mammography, safety helmets, and seatbelts (Abedi, 2014).

The TPB has shown more utility in public health than the health belief model, but it is still limiting in its inability to consider environmental and economic influences. Over the past several years, researchers have used some constructs of the TPB and added other components from behavioural theory to make it a more integrated model. This has been in response to some of the limitations of the TPB in addressing public health problems (Taylor, Bury, Campling, Carter, Garfied, Newbould & Rennie, 2007; McDermott, Oliver, Simnadis, Beck, Coltman, Iverson, & Sharma, 2015).

2.3 Conceptual Framework



Source: Author's Construct (2019)

Figure 1: Conceptual Framework

Figure 1 is a diagrammatic representation of food taboos, the motives or intentions underlying adherence to pregnancy-related food taboos and the resultant effects. Several studies have unearthed the factors that influence compliance or adherence to food taboos during pregnancy. The studies have revealed that the factors are linked to a woman's level of education, superstition, personal lifestyle, ethnicity or cultural background, socioeconomic, and other socio-demographic factors (Ekwochi, Osuorah, Ikenna, Ifediora, Asinobi & Eke 2015; Ugwa, 2016; Ali & Azim, 2016; Arzoaquoi, Essuman, Gbagbo, Tenkorang, Soyiri & Laar, 2015). These studies have again revealed that people adhere to food prohibitions either for health reasons, religion, for protection or as a result of their respect for culture. Superstition, socio

economic factors, level of education of the individual (pregnant woman), personal lifestyle and religious beliefs also influence the rate of adherence to food taboos (Ugwa, 2016). In the views of Oni and Tukur (2012), these factors might supposedly predispose pregnant women to adhere to food taboos. For instance, the level of education of the pregnant women will also influence the rate of adherence to food taboos. The ignorance about nutritional needs during pregnancy worsens the outcome of pregnancy therefore an educated person may be exposed to nutrition information and can make informed decision than someone who is not educated. Food taboos are adhered to during pregnancy for various reasons such as for protection, health and hygiene motives, religious beliefs, cultural reasons, social, economic and historic reasons. The assumption is that non-adherence to food taboos has negative implications during pregnancy. It is perceived that non-compliance to these taboos might result to still birth, miscarriage, pregnancy anaemia, underweight or low birth weight babies, and pregnancy (Golden & Comaroff 2015; Meyer-Rochow, 2009).

Meyer-Rochow (2009) posited that pronouncing certain foods as taboo because they are perceived or thought to make a person sick, is the basis for the many food taboos affecting pregnant women. Largely linked with the realms of mind and 'psyche', most taboos are actually meant to protect the health of the pregnant woman and her offspring and thought to ease the process of birth-giving, even if modern nutritionists completely disagree. Nevertheless, Santos-Tores and Vasquez-Garibay (2003) believe that it is frequently the pregnant and lactating women in various parts of the world that are forced to abstain from especially nutritious and beneficial foods (Masuku & Lan, 2014).

According to some school of thought, food taboos whether scientifically correct or not are often meant to protect the human individual and the observation, for example, that certain allergies and depression are associated with each other could have led to declaring food items taboo that were identified as causal agents for the allergies. Moreover, any food taboo, acknowledged by a particular group of people as part of its ways, aids in the cohesion of this group, helps that particular group maintain its identity in the face of others, and therefore creates a feeling of ~~b~~belonging" (Meyer-Rochow, 2009).

2.4 Food Taboos and Beliefs Associated with Pregnant Women

A dietary practice, lifestyle or habit covers the typical behaviours of specific groups of persons or an individual in relation to food intake. It cuts across food choices, eating times, number of meals, size of portions, method of food preparation and service among others (Amoako-Kwakye, 2010). Dietary practices could be positive or negative depending on the impact it has on one's state of health. Positive or healthy dietary practices involve eating a variety of foods with all the needed nutrients in their correct proportions to meet the body's requirements. It also covers preparing, serving and eating the food in a hygienic environment with regular drinking of safe or potable water. It involves the eating of more bulky complex carbohydrates, piling on of more fruits and vegetables while reducing the intake of high fatty, salty and sugary foods (Pamplona-Roger, 2009). Healthy dietary behaviour is essential for growth and development (Telljohann, Symons & Pateman, 2004).

Dietary practice or habit, as defined by Bediako (2012), is the habitual decisions an individual or a group of people make when selecting foods to consume. The scope of dietary practice spreads over the typical behaviours of specific groups of persons or

an individual in relation to food intake. It cuts across food choices, eating times, number of meals eaten, size of portions per meal, method of food preparation and service among others. Food habit also known as dietary practice or lifestyle is explained by Adigbo and Maddah (2011), as the way in which any group of people select, prepare, serve and eat food as well as the number of times meals are eaten in a day. From another perspective, the term dietary practice can also refer to why and how people eat, which foods they eat, and with whom they eat, as well as the ways people obtain, store, use, and discard food. Individual, social, cultural, religious, economic, environmental, and political factors all influence people's eating habits (Amoako-Kwakye, 2010).

2.4.1 Meaning and common beliefs of food taboos

Before looking into the meaning of food taboos, it is appropriate to define a taboo which would set the tone for a thorough explanation of the concept –food taboo". According to Merriam-Webster online Dictionary (2009), a taboo is defined as a social or religious custom prohibiting or restricting a particular practice or forbidden association with a particular person, place, or thing. From this definition, Maduforo, Nwosu, Ndiokwelu, and Obiakor-Okeke (2013) suggested that food taboos could be rules, codified or otherwise, about which foods, or combinations of foods may not be eaten, and how animals are to be slaughtered in some cases. The origins of these prohibitions and commandments are varied. Hence, in some cases, these taboos are a result of health considerations or other practical reasons. In others, they are a result of human symbolic systems. In the words of Purnamasari (2010), food taboos can be said to be actions to avoid certain foods based on causal explanation which may be supernatural, logical or sometimes difficult to explain rationally. Similarly, Arzoaquo, Essuman, Gbagbo, Tenkorang, Soyiri and Laar (2015) posited that food taboo refers

to a codified set of rules about which foods or combinations of foods that may not be eaten. Contributing to the discussion, Whitehead (2010) intimated that food taboos are part of a complex of attitudes relating to the sense of taste, feelings and abstentions which are concerned in the creation and maintenance of culture differences, male authority and gender inequalities.

Taboos are known from almost all human societies. Probably, food taboos as unwritten social laws exist in one form or another in every society on earth. It is a fact that perhaps nowhere in the world, a people, a tribe, or an ethnic group, makes use of the full potential of edible items in its surroundings (Biza-Zepro, 2015). They further explained that it is the regular avoidance of a food that turns into a tradition which ends up eventually as a food taboo. Taboos food and drinks are food and beverages, which people abstain from consuming because of a religious or cultural prohibition. Many food taboos forbid the meat of a particular animal, including meat, fish, eggs, and snails. Some taboos are specific to a particular part of an animal, while other taboos forgo the consumption of plants or fungi such as mushrooms. Food taboos have a long history and one ought to expect a sound explanation for the existence (and persistence) of certain dietary customs in a given culture. Yet, this is a highly debated view and no single theory may explain why people employ special food taboos (Biza-Zepro, 2015).

According to some school of thought, food taboos whether scientifically correct or not, is habitually meant to shield the human from certain observation, therefore, certain allergies and depression could have led to declaring some food items as taboo. Moreover, Meyer-Rochow (2009) opined that any food taboo acknowledged by a particular group of people as part of its customs, helps in the cohesion of this group,

helps that particular group maintain its identity in the face of others, and therefore creates a feeling of ―belonging". Meyer-Rochow (2009) again stated that food taboos appear to serve a double-purpose: the spiritual well-being of individuals and resource partitioning. He explained that an ecological or medical background is apparent for many, including some that are seen as religious or spiritual in origin. On the one hand, food taboos may help in utilizing a resource more efficiently; on the other food taboos can lead to the protection of a resource. Food taboo, whether scientifically correct or not, is often meant to protect the human individual.

Whitehead (2010) established that food taboos are part of a complex of gustatory behaviours, feelings, attitudes and abstentions which are implicated in the creation and maintenance of social boundaries, masculine authority and gender inequalities. Nevertheless, she argued that at least two issues stand in the way of anthropological (or social scientific) understanding of such ―food complexes".

2.4.2 Pregnancy related food taboos

Dove (2010) conducted a study in rural Northern Ghana and found that in addition to herbal medications, pregnant women were taught about taboos by their immediate families, extended families, and communities. Dove (2010) identified the following food taboos:

a. Bambara beans causes respiratory and skin problems for the child at birth.
b. Honey which causes respiratory problems for the child at birth.
c. Shea butter can cause difficulty in delivery.
d. Corn flour is linked to heavy bleeding at delivery.
e. Eggs, fresh meat, fresh milk, and cold and sugary foods make the unborn baby large, contributing to a difficult delivery and possible death of the mother.

More so, a study by Nti, Larweh and Gyemfua-Yeboah (2002) at Legon (a suburb of Accra) and Dodowa (a rural community), both in the Greater Accra Region of Ghana, revealed that a number of foods were avoided by some expectant mothers during pregnancy for various reasons. These foods included fufu, gari, kokonte (all cassava based foods), fresh fish, corn dough porridge, eggs, banana, crabs and ripe plantain. A related study at Yilo Krobo District by Arzoaqoi *et al* (2015) identified rats, snails, snake, hot food and animal lung as prohibited foods during pregnancy.

2.4.3 Reasons or motives for adherence to food taboos

There may be reason for prohibiting certain food items while allowing others. These reasons can neither be refuted nor accepted scientifically**.** Foods are avoided for various reasons including: historic, hygienic, social, health, logical, economic, ecological, and cultural, as an expression of empathy and a factor in group cohesion and group identity (Gardner, 2009; Meyer-Rochow, 2009; Katz & Weaver, 2010).

The study of Arzoaquoi *et al* (2015) revealed that the condition for non-adherence is just absent in some communities. On the other hand, in rare situation, Krobos who may be compelled to touch snails, for example, will rather do so with their left hands. The right hand is mostly used for eating. It is therefore, believed that touching snail with the right hand will get it contaminated with snail which will be passed on during eating. Their reasons for obeying these taboos were based on health reasons, respect for the ancestors and respect for parents and community elders.

Cultural or religious dietary practices are frequently observed because of a belief that non-observance will cause physical or mental illness, slow down recovery from illness, lead to malformations or result in unfavourable characteristics such as stuttering or baldness (Odebiyi, 1989, cited in Alonso (2015). These fears are

especially prevalent during the reproduction cycle. In many societies mothers fear that non-observance of dietary and health practices during pregnancy will lead to miscarriage, malformation of the baby or illness of the mother or baby (Lee *et al*., 2009 cited in Alonso, 2015). One common belief has established that infants will acquire the characteristics of the proscribed animal or plant when it is eaten by the mother during pregnancy (Martínez, Guillermo & García, 2013; Onuorah & Ayo, 2003; Piperata, 2008).

Meyer-Rochow (2009), contributing to the reasons why people adhere to food taboos, pointed out that food taboos contribute to biodiversity and resource conservation by protecting certain species or areas from overexploitation. He continued that food taboos may also protect the community from health hazards. Masuku and Lan (2014) on their part argued that protection of species can occur indirectly. They maintained that by tabooing vulnerable or rare animals and plants that are used in local medicine, the species is sure to remain available for medicinal purposes when the need arises. Food taboos may also serve to protect human health directly. Anthropological studies have argued that food taboos regarding animals that have died from sickness may serve to prevent diseases from spreading to humans (Alonso (2015). Taboos may also prevent people from eating poisonous or otherwise potentially dangerous animals (Meyer-Rochow, 2009; Seixas & Begossi, 2001; Henrich & Henrich, 2010).

Adding to this discussion, Okunaiya, Fadupin and Oladeji (2016) postulated that a common dietary practice during pregnancy is so-called _eating down'. They argued that women eat less because of the belief that plentiful eating will result in a large infant and cause difficulties during childbirth, or because they believe that food takes up space from the baby. Stressing further, they maintain that given the increased

energy and nutrition needs during pregnancy, eating down is likely to undermine the food and nutrition security status of the mother and fetus. Christian *et al.* (2006), cited in Alonso (2015), found that these beliefs do not necessarily translate into the practice of eating down. The authors show that the practice of eating down is uncommon among women in rural Nepal, even though women share the belief that the baby shares space with food in the mother's body. Most women in fact maintain that the diet is not restricted during pregnancy and that a pregnant woman is encouraged to eat nutritious foods such as fruits, vegetables, dairy products, meat and fish. Among some Nigerian tribes, for instance, there is an absolute taboo regarding the killing and eating of animals that are believed to have aided the tribe in wars in the past (Meyer-Rochow, 2009). Martínez, Guillermo and García (2013) found that among the Fullas in The Gambia, boys and girls should not eat certain foods such as pepper after circumcision because of the belief that eating pepper will result in pain during urination and slower recovery.

2.3.3.1 Other motives influencing dietary practice

Besides food taboos, other factors influencing food acceptability and food habit formation include cultural factors such as national identity, ethnic and cultural group, core, secondary and peripheral foods, meal patterns, religious ideologies, superstition and prohibitions. Physiological factors such as the physiological needs, hunger and satiety, appetite and aversion, sensory appeal, personal preferences and therapeutic diets can influence food acceptability and habit formation while psychological and social factors such as self-status, food status, group identity, emotional support, reward and punishment (Kominiarek & Rajan, 2016; Birkenhead & Slater 2015; Ravaoarisoa, Rakotonirina, Andriamiandrisoa, Humblet & Rakotomanga, 2018; Glencross, 2009). Amoako-Kwakye (2010) also identified a number of factors that

affect one's dietary practices and these include factors such as: peer influence, family influence, religion/ethnicity, money available, health status, school dinning meals and hunger. Other factors include nutritional knowledge and attitudes, parental child feeding practices, family meals, food availability, food accessibility, acculturation and diet, geographical location, technological advancement, education, foreign influence as well as advertisement all influence food habit to a greater extent. Story and Stang (2005) pointed out that eating patterns and behaviours of adolescents are influenced by many factors, including peer influences, parental modelling, food availability, food preferences, cost, convenience, personal and cultural beliefs, mass media, and body image. The three interacting levels of influence which impact adolescent eating behaviours are personal or individual, environmental, and macro systems (Das, Salam, Thornburg, Prentice, Campisi, Lassi, Koletzko & Bhutta, 2017). According to Jodhun, Pem, and Jeewon (2016), attitudes, beliefs, food preferences, self-efficacy and biological changes are mostly the personal factors that influence the eating behaviour of people. They further mentioned some environmental factors to include family, friends and peer networks, and other factors such as school, fast food outlets and social and cultural norms (Jodhun, Pem & Jeewon, 2016).

Cultural Reasons

Various forms of taboos, misconceptions, and cultural beliefs towards certain foods exist in various countries. According to Amoako-Kwakye (2010), each culture has a number of acceptable and unacceptable foods, though this is not determined by the foods being edible or not. For many cultures, alligators are unacceptable as food. But, horses, turtles, and dogs are eaten and even considered a delicacy. Amoako-Kwakye (2010) emphasised that the *'Krobos'*, an ethnic group in the Eastern Region of Ghana consider the eating of snails as a taboo while the same food commodity, snail, is a

delicacy of the *'Akuapims'* of the same region in Ghana. There are also rules concerning whom it is appropriate to eat (Amoako-Kwakye, 2010; Story *et al*., 2002).

Bediako (2012) suggested that a cultural or ethnic group provides guidelines regarding acceptable/avoidable foods, food combinations, eating patterns, and dietary practices for its people. Compliance with these guidelines creates a sense of identity and belonging for the individual. For every cultural or ethnic group, there exist subgroups, and these subgroups may practice variations of eating behaviours, though they are still considered part of the larger group. Someone who is repeatedly exposed to certain foods is less hesitant to eat them (Bediako, 2012). However, the extent to which such food taboos and misconceptions exist and how they affect pregnancy outcomes remain largely unknown (Amoako-Kwakye, 2010).

Religion Reasons

Food is an essential part of religious observance and spiritual ritual for many faiths. Religious proscriptions may range from a few to many and from relaxed to highly restrictive and whatever the case may be, these will affect a follower's food choices and dietary practice (Davies & Thate, 2017). For example, in some religions specific foods are prohibited as they are regarded to be unclean, such as pork among Jewish and Muslim adherents.

The Islamic jurisprudence specifies which foods are lawful (Halal) and which are unlawful or forbidden (Haram) (Devriese, 2016). This is derived from the Qur'an (the Holy book of Islam) as well as the Hadith and Sunnah libraries cataloguing things the Islamic prophet Muhammad is reported to have said and done (Nurdeng, 2009). According to Fadzlillah, Che Man, Jamaludin, Rahman, and Al-Kahtani (2011), the only foods that are unambiguously forbidden are meat from dead animals, drinking of

blood, the meat of swine (porcine animals, pigs), and animals dedicated to other than God (Allah). Nonetheless, in the views of Nurdeng (2009), animals that are vegetarian are allowed, including cattle, sheep, goats, deer, bison, camel, and rabbit. Birds that eat seeds and vegetables are permitted (chicken, duck, pigeon sparrow, etc.) The slaughtering of these animals must be done by a Muslim while invoking the name of Allah in accordance with the Islamic law (Zabihah) (Devriese, 2016). However, there is debate as to whether animals slaughtered by Christians and Jews are lawful for Muslims (Khattak, *et al.,* 2011; Al-Qaradawi, 1993).

Specific foods that are forbidden in Islam include; pigs, mules, donkeys, dogs, monkeys, elephant, cats, mouse, rat, wild animals and all predators (animals with fangs), birds that hunt with talons (hawks, eagles, etc.) and prey on animals (Rahman, *et al.,* 2011; Al-Qaradawi, 1993). However, there are disagreements regarding the consumptions of fishes. Some school of thought follow the same strict rules as Kashrut (Jewish dietary law). Others permit all fish but not shellfish (Al-Qaradawi, 1993). A few classify shrimp and prawns as "fish", while still others consider all seafood permitted (Nurdeng, 2009). Whatever the case may be, dead fishes in the water before they are caught are forbidden. Nevertheless, fishes that are killed by removal from water or by a blow are permitted according to the school of thought to which one subscribe (Al-Qaradawi, 1993).

With regards to Christianity, the Seventh-day Adventists discourage "stimulating" beverages such as alcohol, which is not forbidden among Catholics faith. Some Christians forbid pork and all animals that do not chew cud. The traditionalists on the other hand do not consume any foods that might slow down their spiritual or physical

growth. The eating of pork, fowl, ducks, snails, crabs, and camels are avoided based on ones traditional belief (Wardlaw & Smith, 2009).

2.4.4 Implications of food taboos on maternal health

Food taboos have been identified as one of the factors contributing to maternal under nutrition in pregnancy, especially in rural African communities (Otoo, Habib, & Ankomah, 2015). For social and biological reasons, women of the reproductive age are amongst the most vulnerable to malnutrition, a common consequence of food taboos in rural communities (Biza Zepro, 2015). According to the World Health Organization report on ―Development of a Strategy towards Promoting Optimal Foetal Growth" (2002), there is growing evidence that improving the quality of the diet of the mother during the first half of pregnancy can have as big an effect on birth weight as providing food supplements later in pregnancy (WHO, 2007). Certainly, the risk of delivering a low-birth-weight baby can be determined very early in pregnancy (Naeem, Zill-E-Huma & Afridi, 2013), and the influence of maternal nutritional status on pregnancy outcomes is more important in early rather than late pregnancy (Elhassan *et al.,* 2010). However, low birth weight is a major determinant of mortality, morbidity and disability in infancy and childhood and also has a long-term impact on health outcomes in adult life (Ribeiro, de Carvalho Lima, de Lira, & da Silva, 2015).

The GSS *et al.* (2009) cited in Arzoaquoi *et al.* (2015) also highlighted that a woman's nutritional status has important implications for her health as well as the health of her children. Malnutrition in women results in reduced immunity and an increased susceptibility to infections, slow recovery from illness, reduced productivity and heightened risks of adverse pregnancy outcome. More so, contributing to the

discussion on the implication of food taboos on pregnant women, Piperata (2008) pointed out that the problem of malnutrition is particularly pressing during pregnancy and lactation, when energy and nutritional needs of the pregnant and nursing mother are higher. Piperata (2008) intimated that the nutrition and health status of a child are strongly dependent on the nutrition and health status of the mother before, during, and after pregnancy. Confirming this, Muthayya, (2009) established that ―maternal malnutrition has been linked to low birth weight, which in turn results in high infant morbidity and mortality. Foetal malnutrition harms health status in later life, and in fact predisposes one to increased incidence of non-communicable diseases". Corroborating this Naeem, Zill-E-Huma, and Afridi (2013) believed that increased perinatal and neonatal mortality, a higher risk of low birth weight babies, stillbirths, and miscarriage are some of the consequences of malnutrition in women.

Demelash *et al.*, (2015) also stated that without adequate nutrition during pregnancy, foetal growth and infant health are compromised. In general, consequences of malnutrition during pregnancy include foetal growth retardation, congenital malformations (birth defects), spontaneous abortion and stillbirth, preterm birth and low infant birth weight. Preterm birth and low infant birth weight, in turn, predict the risk of stillbirth in a subsequent pregnancy (Demelash *et al.*, 2015). Furthermore, Ellie and Sharon (2008) said that malnutrition, coupled with low birth weight, is a factor in more than half of all deaths of children under four years of age worldwide.

A study by Shafir, Angulo-Barroso, Jing, Y, Angelilli, Jacobson, and Lozoff, (2008), on ―Iron deficiency and infant motor development" in Tanzania, revealed that eating fish was believed to hurt the mother's abdomen and also cause late delivery; eating farm meat would make the child take on characteristics of farm animals. The high

prevalence of severe anaemia during pregnancy in that district was linked to food taboos among other factors (Gebre & Mulugeta, 2015; Worku Takele, Tariku, Wagnew Shiferaw, Demsie, Alemu, & Zelalem Anlay, 2018; Lebso, Anato & Loha, 2017). In a related study by Riffat and Khan (2008), they demonstrated a causal relationship between severe anaemia and various maternal and perinatal complications. The underlying cause was claimed to be iron deficiency. Iron deficiency anaemia results in impaired transport of haemoglobin and thus oxygen to uterus, placenta and foetus. It also causes tissue enzyme and cellular dysfunction. This mechanism can explain impaired myometrial contractility resulting in atonic uterus, as well as placental dysfunction leading to preterm birth, low birth weight and growth restricted babies and perinatal deaths. All this is as a result of certain vital nutrients lacking in pregnant women's diet as a result of food taboos.

2.5 Nutritional Knowledge of Pregnant Women

Various definitions and explanations given to pregnancy give the same idea that it occurs when a fertilized egg, through sexual intercourse, attaches itself to the lining of the uterus. Pregnancy is the period from conception to birth when a woman carries a developing foetus in her uterus. Carlson, *et al.,* (2004) stated that pregnancy occurs as the result of the female gamete merging with the male gamete in a process referred to, in medicine, as fertilization, or more commonly known as conception. Pregnancy symptoms differ from woman to woman and pregnancy to pregnancy (Kitzinger, 2008). However, one of the most significant pregnancy symptoms is a delayed or missed menstrual cycle. Pregnancy is the state of expecting a child, in the case of humans as noted by Medical News Today (MNT, 2013).

The World Health Organisation (WHO, 2002) defined nutrition as the process by which the body ingests, digests, absorbs, transport, utilize and excretes food substance. Collins Compact Dictionary (2003) defines nutrition as the process of taking in and absorbing nutrients or the process of being nourished. Nutrition is the provision, to cells and organisms, of the materials necessary (in the form of food) to support life. Nutrition is defined as the science of food and other substances they contain and their actions within the body which includes ingestion, digestion, absorption, transport, metabolism and excretion (Whitney & Rolfes, 2005). Nutrition, as defined by Ladau (2010), is the sum total of the processes involved in the taking in and the utilization of food substances by which growth, repair and maintenance of the body are accomplished. A broader definition includes the social, economic, cultural and psychological implications of food and eating. According to Medical News Today (MNT, 2013), nutrition *is* the science or practice of consuming and utilizing food. It is the study of food at work in the human body, the source for energy, and the medium for which nutrients can function (MNT, 2013).

According to Amoako-Kwakye (2010), most people define food simply as anything that keeps the human being alive. Amoako-Kwakye (2010) added that food and human life are perceived from both the biochemical and social points of view and therefore is defined as ~~a~~anything solid or liquid, possessing a chemical composition which enables it when eaten to do one or more of the following:

a. Provide the body with materials from which it can produce work, heat or other forms of energy;
b. Provide materials for growth, maintenance, repair or reproduction;
c. Supply substances which normally regulate the production of energy or processes of growth, repair or reproduction;

d. Conforms to the prejudices, beliefs and taboos of the people to whom it is presented so that they will be willing to eat it, and;
e. Is available without restrictions by social or community barriers which might prevent people from eating it.

Amoako-Kwakye (2010) further pointed out that this definition shows that food forms the basis of life and is irreplaceably responsible for survival by virtue of its constituents such as proteins, carbohydrates, fats, vitamins, minerals and water; collectively known as nutrients. It also takes into account the social functions of food since it also forms the integral part of culture which is the total way of life of a particular group of people.

Adigbo and Maddah (2011) listed some food sources of carbohydrates to include all starchy roots tubers, cereals, plantain, fruits and vegetable. The components of a meal vary across cultures, but generally include grains and tubers such as maize, rice, wheat, millet as well as yam, cassava, and potatoes as accompaniment to meat or a meat substitute, such as fish, legumes (groundnuts, melon seeds, beans of all kinds), milk and dairy products; which are taken along with fruits and vegetables (Adigbo & Maddah, 2011).

The kind of food normally eaten by an individual or a family is termed diet, and the kind of diet one has contributes immensely to the nutritional and health status of that particular individual or family (Adigbo & Maddah, 2011). A diet is the food that a person or animal usually consumes (Premalatha, *et al.,* 2011). Revuz, (2010) referred to diet as the customary amount and kind of food and drink taken by a person from day to day; more narrowly, a diet planned to meet specific requirements of the individual, including or excluding certain foods. Food can only be eaten when it is

available and accessible and the kinds of foods selected and eaten by individuals or families gradually forms a pattern which when practiced over a period becomes a food habit that will be deeply rooted in them and therefore become quite difficult to change (Amoako-Kwakye, 2010). When an individual is aware of how to meet these nutritional needs, it facilitates food choices, enhancing health and wellness by preventing excess or less of intake of nutrients that could be associated with ill health (Masuku, & Lan, (2014).

Food, like other substance is composed of different chemical elements which give individual foods their flavour, colour, texture and affect their reaction to heat and their digestion. Nutrients are the chemical components found in food (Asma *et al.,* 2012). The six major classes of nutrients are: carbohydrates, fats, minerals, protein, vitamins and water (Amoako-Kwakye, 2010; Asma *et al*, 2012). These nutrient classes can be categorized as either macronutrients (needed in relatively large amounts) or micronutrients (needed in smaller quantities). The macronutrients include carbohydrates, fats, fibre, protein, and water. The micronutrients are minerals and vitamins (Berg, Tymoczko & Stryer, 2002). About 60-80% of neonatal death is attributed to low birth weight, and low birth weight is highly associated with maternal nutrition, and in Africa, 20% of low birth weight is due to maternal malnutrition (WHO, 2009).

In pregnancy, good nutrition is essential to ensure good maternal health and reduce the risk of birth defects, suboptimal foetal growth and development as well as chronic health problems in their children (Rusescu, 2005). If women are not well nourished, they are more likely to give birth to weak babies resulting in high infant mortality rate (Kamla-Raj, 2006).

Dietary practices have continued to change due to the widening food choices. Food market system continues to be infiltrated by both healthy and unhealthy food products. Therefore, much attention should be given in enhancing right information and clear labelling of products to address concerns by consumers on intake of adequate nutrients and healthy choices (Contento, 2008). A proper diet is therefore essential in providing the proper quantity of the food for energy and quality of the food to provide the essential micro- and macro-nutrients for proper human growth and development especially from early childhood (Neumann, Harris & Rogers, 2002). The food choices of students on school campuses are of significant nutritional consequence (Dolar, 2009). Most people had snacks more than once per day, and snacks have some influence on energy intake (Hirschi, 2009).

In a research on pregnant women from the antenatal clinic of the Korle-Bu Teaching Hospital and Osu Maternity Home in Accra, Koryo-Dabrah, Nti and Adanu (2012), found that socio-demographic factors such as age, educational level, marital status and income have been found to influence the amount of nutrient intake. In another study conducted in Yilo Krobo District, Arzoaquoi *et al* (2015) confirmed that pregnant women with higher education level consumed higher amount of protein compared to women with low and middle level of education.

Nutrition prior to pregnancy

A healthy pregnancy and delivering a healthy child actually start before conception. The emphasis is on the importance of the preconception week in getting a baby off to a good start (Ho, Flynn & Pasupathy, 2016). A newly recognized fact is that the man‘s as well as the woman‘s health habits before conception are important. For at least three months before pregnancy, both parents should be free from drugs of all

kinds including, over-the-counter medications; prescription medication (with the physician's consent) and mind alerting drugs, including alcohol (Barger, 2010). Barger (2010), stated that both prospective parents should be well-nourished. Nutrition affects the ova and sperm, and good nutrition supports the hormone balance needed for conception. This activity is known as nutritional flushing.

Ho, Flynn and Pasupathy, (2016) admonished expectant mothers to adopt a healthy lifestyle while they are trying to become pregnant. However, in the view of Merritt and Graves (2010), the best time to begin eating a healthy diet is before getting pregnant. According to them, this would help both mother and your baby to start out with the nutrients they both need. According to Graves (2011), in early pregnancy, morning sickness could affect eating habits of a pregnant woman. She might crave for certain foods or she might not feel like eating. If this happens, she should still try to eat a variety of foods each day to help ensure that she is getting the right amount of nutrients.

Nutritional needs of pregnant mothers

Evidence suggests a strong association between maternal nutrition and foetal growth (Ali, Thaver & Khan, 2014). Poor nutritional status of the mother leads to adverse birth outcomes like preterm delivery, low birth weight babies and intrauterine growth retardation. Correspondingly, good nutritional status of mothers results in a healthy birth outcome, therefore, the diet consumed by pregnant women should be balanced and diverse (Ali, *et al*., 2014). Pregnancy compels the need for significant extra calorie and nutrient requirements. An adequate balanced diet is therefore, of utmost importance during pregnancy and lactation to meet the increased needs of the mother, and to prevent ~~-n~~utritional stress (Park & Park's, 2007). Many studies found that

pregnant women in various parts of the world are forced to abstain from nutritious foods as a part of their traditional food habits (Ugwa, 2016). The lack of knowledge about nutritional needs during pregnancy worsens the outcome of pregnancy. Arzoaquoi *et al.* (2015) on their part asserted that an adequate availability of nutrients during gestation is probably the single most important environmental factor influencing pregnancy outcome. Ugwa (2016) suggested that a sufficient supply of nutrients is required to maintain the delicate balance between the needs of the expectant mother and those of the foetus. King (2003) also established that an inadequate supply will cause a state of biological competition between the mother and the foetus in which the well-being of both organisms is at serious risk. According to Arzoaquoi *et al.* (2015), the ignorance about nutritional needs during pregnancy worsens the outcome of pregnancy.

However, The GSS *et al*. (2009) also highlighted that a woman's nutritional status has important implications for her health as well as the health of her children. Malnutrition in women results in reduced immunity and an increased susceptibility to infections, slow recovery from illness, reduced productivity and heightened risks of adverse pregnancy outcomes. GSS *et al*. (2009) maintained that a woman who has poor nutritional status as indicated by a low body mass index (BMI), short stature, or other micronutrient deficiencies has a greater risk of obstructed labour, of having a baby with low birth weight, of producing lower quality breast milk, of dying from post-partum haemorrhage, and of contracting diseases along with her baby.

A balanced diet is a basic part of good health at all times in one's life. During pregnancy, the diet is even more important. Asma, Asma-Ul-Hosna and Ashraful (2012) assert that a woman's nutrient needs increase tremendously in pregnancy but

her energy (calorie) needs increase just a little. According to them, from conception to birth, all parts of the infant- bones, muscles, organs, blood, cell, skin and other tissues are made from nutrients in foods which the mother eats. Asma, Asma-Ul-Hosna and Ashraful (2012) further argued that most women have higher needs of nutrient during pregnancy and lactation than any other time. Therefore, to meet the high nutrient demand of pregnancy, a woman would need to carefully make food choices, but her body would also help by maximizing absorption and minimizing losses (Asma, Asma-Ul-Hosna & Ashraful, 2012; Webb *et al*., 2005).

Proper dietary balance is necessary to ensure sufficient energy intake for adequate growth of foetus without drawing on mother‘s own tissues to maintain her pregnancy (Mridula, Mishra & Chakravorty, 2003; Yetunde, & Olubukunola, 2015). Improved maternal nutrition has been associated with increased Foetal growth and a reduction in adverse birth outcomes in developing countries and in population with nutrient deficiencies (Morrison, & Regnault, 2016; Marangoni, Cetin, Verduci, Canzone, Giovannini, Scollo & Poli, 2016).

A study conducted Meyer-Rochow (2009) stated that food taboos appear to serve a double-purpose: the spiritual well-being of individuals and resource partitioning. He explained that an ecological or medical background is apparent for many, including some that are seen as religious or spiritual in origin. On the one hand, food taboos can help utilization of a resource more efficiently; food taboos can lead to the protection of a resource (Meyer-Rochow, 2009).

Major nutrients needed in pregnancy

Abu-Saad and Fraser (2010) indicated that ample carbohydrate (ideally, 175grams or more per day and certainly not less than 135 grams) is necessary to fuel the Foetal

brain and spare the protein needed for growth. In support of this, Kominiarek and Rajan (2016) stated that energy needs of pregnant women are greater than those of non-pregnant women where an additional 340 and 450 calories are needed during the second and third trimesters respectively. The increase in nutrient needs is often great and so nutrient-dense foods should supply the extra calories- foods such as whole grain breads and cereals, legumes, dark green vegetables, citrus fruits, low-fat milk and milk products, lean meats, fish, poultry and eggs (Kominiarek and Rajan, 2016; Ho, Flynn, & Pasupathy, 2016; Specker, 2015; Butte & King, 2005; Plećaš, Plešinac & Vučinić, 2014).

The Recommended Daily Allowance (RDA) of protein for pregnancy is an additional 25grams per day (Kominiarek & Rajan, 2016; Ho, Flynn & Pasupathy, 2016). Pregnant women could easily meet their protein needs by selecting meat, milk products and protein-containing plant foods such as legumes, whole grains, nuts and seed. Abu-Saad and Fraser (2010) agree that the recommended dietary allowance for pregnancy is an additional 25grams per day higher than for non-pregnant women. Expectant mothers could easily meet their protein needs by selecting meats, milk products and protein-containing plant foods such as legumes, whole grains, nuts and seeds. Use of high-protein supplements during pregnancy might be harmful and should be discouraged. Ho, Flynn and Pasupathy, (2016) supported this assertion and they noted, in a research conducted in Boston, that an adequate protein intake is associated with a greater success of pregnancy.

On the account of Deriemaeker *et al*., (2007), pregnant women need iron (27mg/day) to support their enlarged blood volume and to provide for placental and foetal needs. The developing foetus draws on maternal iron stores to create stores of its own to last

through the first four to six months after birth when milk, which lacks iron, is its sole food (Deriemaeker et al., 2007). During pregnancy, the body makes several adaptations to help meet the exceptionally high need for iron (Payne, Hahn & Mauer, 2005). Garry, Cunningham and Harms (2007) stated that good nutrition could often meet iron needs during pregnancy. Deriemaeker *et al*., (2007) further indicated that a total of 1100mg of iron is needed to account for the basal losses, products of conception and new red blood cells in the expanded blood volume of an initially non-anaemic woman who remains non-anaemic through term. That notwithstanding, Völgyi, Carroll, Hare, Ringwald-Smith, Piyathilake, Yoo, and Tylavsky (2013) establish that few women enter pregnancy with adequate iron stores and so a daily iron supplement is recommended during the second and third trimesters for all pregnant women. For this reason, most prenatal supplements provide 30-60 milligrams of iron a day (Völgyi, *et al.,* 2013). To enhance iron absorption, Gautam, Saha, Sekhri and Saha (2008) suggest that pregnant women should take iron supplements between meals or at bedtime with liquids other than milk, coffee or tea, which inhibit iron absorption. During pregnancy, however, iron is needed not only for new red blood cells but also for the foetus and placenta (360 mg). An additional 230mg is needed for the 0.8mg daily endogenous iron lost over 280 days of gestation and therefore a total of 590mg is needed (Milman, 2015; Sharma, Jain & Mallika, 2004).

The United States (U.S.) Public Health Service recommends that women of childbearing age should obtain or needed 400 micrograms (0.4 milligrams) of folate or folic acid each day. This B vitamin helps reduce a baby's risk of neural tube birth defects such as spina bifida. If your family has a history of neural tube defects; your doctor may increase your daily intake. Folic acid could be obtained naturally through

eating dark green leafy vegetables (that is spinach), citrus fruits, nuts, legumes, whole grains, fortified breads and cereals. These foods could be supplemented with vitamin which usually contains 800mg of folic acid during prenatal period. Folic acid is a water-soluble vitamin which allows the body to flush out excess amounts of iron (Dunlap, Shelke, Salem & Keith, 2011; Garry *et al*., 2007; Talaulikar & Arulkumaran, 2013; Lassi, Salam, Haider & Bhutta, 2013; Greenberg, Bell, Guan & Yu, 2011).

According to Dunlap *et al*. (2003), the requirement for folate increases dramatically during pregnancy. It is best to obtain sufficient folate from a combination of supplements, fortified foods and a diet that includes fruits, juices, green vegetables and whole grains. The RDA for folate during pregnancy is 600µg per day. Pregnant women have a slightly greater need for the B vitamin which activates the folate enzyme for B_{12}-2.6µg is needed per day (Pinto, Barros, & Santos Silva, Dos, 2009). Generally, even modest amounts of meat, fish, eggs or milk products together with body stores easily meet the need for vitamin B_{12} (Ho, Flynn & Pasupathy, 2016).

Other nutrients needed in pregnancy include essential fatty acids, zinc and nutrients for bone development which are vitamin D, calcium, phosphorus, magnesium and fluoride which are in great demand during pregnancy. Insufficient intakes of these might produce abnormal foetal bones and teeth. Vitamin D especially, plays a vital role in calcium absorption and utilization. Consequently, severe maternal vitamin D deficiency interferes with normal calcium metabolism, resulting in rickets in the foetus and osteomalacia in the mother. Regular exposure to sunlight and consumption of vitamin D-fortified milk are usually sufficient to provide the recommended amount of vitamin D during pregnancy. Routine supplementation is not recommended

because of the toxicity risk (Salam, Haider & Bhutta, 2013; Pinto, Barros, & Santos Silva, Dos, 2009; Insel *et al*., 2003).

In relation to the above, Cooper Shanta, Mahmud, Roth, and Gernand (2015) confirmed that a serving of fortified breakfast cereals is also helpful. The serving from the milk, yogurt and cheese group supply extra protein, calcium, riboflavin and magnesium. Servings from the meat, poultry, fish, dry beans, eggs and nuts group supply protein, iron and zinc; and vegetable protein sources eaten provide much of the extra magnesium needed during pregnancy. The vegetable and fruit group serving provides a variety of vitamins and minerals. One serving from this combination should be a good vitamin C source, and one serving should be a green vegetable or other rich source of folate such as spinach or orange juice. Selections from the bread, cereal, rice and pasta group should include some whole-grain varieties (Cooper *et al*., 2015).

Some suggested foods for pregnant women

According to Kaiser and Allen (2008), the American Dietetic Association in 2002 established that for a pregnant woman, maintaining optimal nutrition through healthful food choices such as fruits, vegetables, dairy products, whole grains and lean protein is ideal. But another important task for any future mother is remembering to take vitamin everyday during the prenatal period. However, according to the American College of Obstetricians and Gynecologists (ACOG, 2011), pregnant women should have a diet that consists of a variety of foods including proteins, carbohydrates, vitamins, minerals and fats. Folic acid could be obtained naturally by eating dark green leafy vegetables (i.e. spinach), citrus fruits, nuts, legumes, whole

grains, and fortified breads and cereals (Lassi, Salam, Haider & Bhutta, 2013; Garry *et al*., 2007).

Lassi, Salam, Haider and Bhutta (2013) suggested that pregnant women should eat food that supplies good general nutrition such as vegetables, fruits and dairy as well as pregnancy-specific nutrition such as raw meat and cheeses. According to the Medical News Today (2012), for a healthy pregnancy, the mother's diet needs to be balanced and nutritious - this involves the right balance of proteins, carbohydrates and fats, and consuming a wide variety of vegetables and fruits.

The First Trimester

This stage involve the first three months of pregnancy. Nutritional deficiencies at this stage can alter or arrest the progressing phase of development, and these effects may last a lifetime (United Nations Children's Fund, 2012; Cox, & Phelan, 2008). According to Patil, Mittal, Vedapriya and Khan (2010), during the first trimester, the foetus develops so rapidly that if an essential nutrient is not available, the foetus may be affected even before evidence of the deficiency appears in the mother. Due to this, the quality of one's nutritional intake is more important than quantity in this stage of pregnancy. Hence pregnant women should consume nutrient dense food, though the amount should be the same as that before conception (Patil *et al.,* 2010). Though some women lose their appetite and feel nausea during the first trimester, they should be careful to obtain adequate nutrition (Shin, Bianchi, Chung, Weatherspoon & Song, 2014).

The Second Trimester

The fourth month to the sixth month of pregnancy constitutes the second trimester. Nutritional deficiencies at this stage have a greater effect on the mother than the foetus. For instance if she does not meet her nutritional requirements at this time, her ability to successfully breastfeed her infant may be affected, as fat stored during pregnancy serves as energy reserve for lactation (Shin, Bianchi, Chung, Weatherspoon & Song, 2014; Cox, & Phelan, 2008).

The Third Trimester

This is made up of the last three months of pregnancy (7-9 months). This trimester is a very crucial stage. At this stage, infants act as parasites with regard to iron, in that they will deplete the stores of the mother. Therefore if the mother is not meeting her iron needs at this time she can end up very depleted after delivery (Shin *et al*., 2014; Cox, & Phelan, 2008).

Silversides and Colman, (2016) positioned that the physiological changes that occur in pregnancy are necessary for the development of the foetus, regulation of maternal metabolism and preparation for parturition and lactation. Silversides and Colman, (2016) argued that pregnancy may result in discomforts such as antenatal nausea, oedema, gestational goitre, anaemia and gestational diabetes. However, the combined effects of these discomforts can lead to unfavourable alteration in food intake and overall nutritional habits (Silversides & Colman, 2016). Therefore, to meet the extra nutritional needs and to ensure good health of both infant and mother, multivitamin and mineral supplements (MVMS) are prescribed for pregnant women on their first attendance to maternal and child health (MCH) centres (Hudson, 2005; Brown, 2005; Parul, 2003).

2.6 Effects of Nutritional Status on Pregnancy

Evidence showed that extra nutrients and energy are used for Foetal growth as well as the changes in the mother's body to accommodate the foetus (Nuriel-Ohayon, Neuman, & Koren, 2016; Edusei, Bentum & Nkum, 2014). Although it is difficult to specify what degree of poor nutrition would affect each pregnancy, a daily diet containing only 1000 kcal has been shown to greatly restrict Foetal growth and development, and increased maternal and infant death rates seen in famine-stricken areas of Africa suggest further threat and evidence (Abuya, Ciera, & Kimani-Murage, 2012). The nutrition habits and lifestyle choices people make could influence the course of pregnancy which they do not even plan at the time. Severe malnutrition and food deprivation could reduce fertility — women might develop amenorrhea; men lose their ability to produce viable sperm. Furthermore, both men and women lose sexual interest during times of starvation (Schulster, Bernie & Ramasamy, 2016).

According to Morrison and Regnault, (2016) without adequate nutrition during pregnancy, Foetal growth and infant health are compromised. Yang and Huffman (2013) asserted that when a woman whose nutrition has been poor becomes pregnant, she might not have stored the nutrients she needs to produce a healthy baby. Garry *et al*. (2007) also established that good nutrition could often meet iron needs or requirements during pregnancy. Iron helps to produce hemoglobin which prevents anemia and low birth weight.

Morrison and Regnault (2016) further noted that the worse the nutritional condition of the mother at the beginning of pregnancy, the more valuable a good prenatal diet and/or use of prenatal supplements are in improving the course and outcome of her pregnancy. It also appeared that the mother's diet - not only during pregnancy but also

preceding conception affects the health of both mother and infant. A woman's nutritional and overall health, before and during pregnancy, influences the health of her developing baby. Eating well, combined with taking a daily multivitamin supplement with folic acid and iron, could give a woman the nutrients she needs to feel good, have energy and support a healthy pregnancy (Merritt & Graves, 2010).

Knowledge of pregnant women on nutritional practices

According to Masuku and Lan (2014) studies indicated that the period in and around pregnancy could indeed be such a special moment in life. Women went from a passive or _cold' type of nutrition awareness to a more active or _hot' type of nutrition awareness; they regarded the theme _food and health' as more salient; they were more preoccupied by it and they were more eager to formulate action rules in this field. This increased nutrition awareness could transform into a new postpartum routine or lifestyle identity (Bukusuba, Kikafunda & Whitehead, 2010). Consequently, a pregnant woman might also be more sensitive to healthy nutrition promotion activities and might actively seek nutrition-related information, as nutrition becomes more personally relevant (Fekadu Beyene, 2013; Bukusuba, Kikafunda & Whitehead, 2010; Perumal *et al*., 2013; Lucas, Charlton, & Yeatman, 2014; Mirsanjari, Abdul, & Wan, 2012). Bamanikar and Kok Kee, (2013) stated that information about nutrition and health concerns of various diets on health might encourage those responsible for food purchasing and preparation to adjust food patterns in accordance with public health suggestions on diet. Patterns of eating out might also be influenced. Fowles (2002), in comparing pregnant women's nutritional knowledge to their actual dietary intake, found out that most women had inadequate general nutritional knowledge, and their dietary intake did not meet all the nutritional requirements of pregnancy. Again, women attending the free prenatal clinic had more accurate knowledge of the

recommended number of servings for some food groups (fruits and vegetables, meats and dairy) than women in childbirth education classes (Bookari, Yeatman & Williamson, 2017; Bamanikar & Kok Kee, 2013).

Many studies indicate that maternal obesity during pregnancy is associated with many pregnancy complications, such as pregnancy related gestational diabetes (Poston, L., Harthoorn & Van Der Beek, 2011), preeclampsia (Baeten *et al*., 2001; Frederick *et al*., 2006), cesarean delivery (Baeten *et al*., 2001), and delivery of a macrosomic infant (Baeten *et al*., 2001). According to Calhoun (2014), barriers based on beliefs, knowledge, attitudes, lifestyles, pregnancy unplanned or when viewed negatively or both, unmarried, and less-than-high-school education affects women's food choices when they become pregnant.

Morrison and Regnault (2016) found out that most women had inadequate general nutritional knowledge. Bamanikar and Kok Kee (2013) asserted that information about nutrition and health concerns of various diets on health might encourage those responsible for food purchasing and preparation to adjust food patterns in accordance with public health suggestions on diet. Graves (2011) observed that majority of pregnant women already had a fair knowledge on the appropriate diet they needed to eat in order to stay healthy and those who visited ante-natal clinics were also given more advice on healthy food choices. Bentum (2011) indicated that mothers who have knowledge about food and nutrition provided the family with nutritious food.

2.7 Summary of Literature Review

The period in and around pregnancy is indeed a critical moment in life. Healthy pregnancy and delivering a healthy child is relatively dependent on healthy lifestyle including good nutrition (eating balanced diet) or dietary practices before, during and after pregnancy. A broader definition of nutrition includes the social, economic, cultural and psychological implications of food and eating. In the context of this study, nutritional practices refer to health seeking behaviour including seeking nutritional knowledge and actual dietary practices during pregnancy. The perception of health and health seeking behaviour among pregnant women is influenced by a myriad of factors, including their traditional beliefs and food taboos.

The nutritional knowledge, food choices and other dietary practices of pregnant women could be influenced by socio-economic and cultural factors such as traditional and religious beliefs (food and nutritional taboos), gender, race, socio-economic status (poverty, low education level, living conditions, social identity (being a member of a church or being married). Food taboos, socio-economic and cultural factors have implications on the knowledge and dietary practices of pregnant women.

The nutritional knowledge of pregnant women as well food taboos could affect their dietary habits or lifestyle, including food choices and actual dietary intake. Increased nutrition awareness could transform into a new postpartum routine or lifestyle identity. A pregnant woman might be more sensitive to healthy nutrition promotion activities and she might actively seek nutrition-related information as nutrition becomes more personally relevant. However, poor or low level of nutritional knowledge by pregnant women and food taboos could result in bad food choices and unhealthy dietary habits or practices, food deprivation, malnutrition and reduce

fertility. For instance, a pregnant woman might crave for certain foods or she might not feel like eating.

It is advisable that expectant mothers and fathers seek appropriate nutritional knowledge even before conception. Pregnant women should eat a variety of foods each day to help ensure that they are getting the right amount of nutrients before, during and after conception. Both the expectant mothers and fathers should also adopt healthy lifestyles including recommended daily intake of fresh fruits and vegetables, daily intake of adequate fluids including safe water, regular physical exercise, routine medical check ups, avoidance of drug, tobacco and alcohol intake among others.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter gives an overview of the research methodology employed in this study. This chapter discusses the methods used to carry out the study. It includes the research design, population, sample and sampling techniques, instrumentation, validation of research instruments, reliability of instrument, data collection procedure, method of data analysis and ethical considerations.

3.2 Research Design

Research design refers to the overall plan employed by the researcher to obtain answers to the research questions and for testing the hypotheses formulated (Agyedu, Donkor & Obeng, 2011). Taking into consideration the purpose and objectives of the study, this study is of descriptive cross-sectional survey. Specifically, it employed the mixed-methods approach with a sequential explanatory design.

According to Agyedu, Donkor and Obeng (2011), a descriptive study seeks to gather information so that a description of what is going on can be made. It may be designed to discover whether there is any relationship between two variables (but not causal relationship). According to Olsen (2012), a cross sectional study design is used when the purpose of the study is to find the prevalence of the outcome of interest for the population or subgroups within the population at a given time. The use of a cross-sectional study enabled the researcher to include various ethnic groups with variations or differences in food taboos. With the findings, the researcher is then able to draw the differences and similarities in food taboos among the different ethnic groups. One

advantage of this type of study is that the researcher can estimate the prevalence of outcome of interest, because sample is usually taken from the whole population.

Creswell (2013) defined the mixed methods research approach as an approach in which the inquirer or researcher collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches and methods in a single study or a programme of study. The mixed method gives greater strength to a study and makes it more credible than just using one approach. It also helps to research a process or a problem from all sides (Creswell & Clark, 2007). The mixed-methods sequential explanatory design consists of two distinct phases: quantitative followed by qualitative (Marvasti. 2018; Creswell, 2013).

The sequential explanatory design is characterized by the collection and analysis of quantitative data followed by the collection and analysis of qualitative data (Creswell, 2013) in two consecutive phases within one study. This design allows a researcher to collect and analyse the quantitative (numeric) data as the first phase. The second phase (qualitative) builds on the first phase and the two phases are connected in the intermediate stage in the study. The qualitative (text) data are collected and analysed second in the sequence and they help to elaborate or explain the quantitative results obtained in the first phase (Creswell, 2013, 2005; Creswell *et al*., 2003). This design has found application in both social and behavioural sciences research (Bhattacherjee, 2012).

The underlying principle for this approach is that the quantitative data and their subsequent analysis provided a general understanding of the research problem. The qualitative data and their analysis refined and explained those statistical results by exploring participants‘ views in more depth (Creswell, 2013).

The weaknesses and strengths of this mixed-methods design have been extensively discussed in the literature (Creswell 2013, 2005; Harwell, 2011; Green & Caracelli 1997; Marvasti. 2018). The advantages include straightforwardness and opportunities for the exploration of the quantitative results in more detail. This design can be especially useful when unexpected results arise from a quantitative study (Creswell 2013). The limitations of this design include lengthy time and feasibility of resources to collect and analyse both types of data. Again, It is not easy to implement.

3.3 Study Area

This study investigated Food taboos and common beliefs associated with pregnant women in Kasoa Zongo community in the Central Region of Ghana. Kasoa, formerly known as Odupongkpehe, is a peri-urban town in the Awutu Senya East Municipal District of the Central Region of Ghana. Kasoa is traditionally home to the Gomoa and Awutu tribes who belong to the Akan ethnic group. Today, it is home to other ethnic groups such as Hausa, Gas, Chambas, Ewes, Walas/Dagartis, Kotokolis, Moshes, Basares and other smaller tribes. Kasoa is reported to be one of the fastest growing communities in West Africa with a population estimated to be 69,384 people as at 2010 (Awutu Senya East Health Directorate, 2013). The area is one fundamentally challenged with inadequate provisions of basic amenities like, housing, poor drainage systems, inadequate health facilities and erratic flow of potable water due to technical challenges. Kasoa houses a large number of migrant workers from rural Ghana and some neighbouring countries like Togo, Niger, Nigeria, Burkina-Faso and Ivory Coast. Kasoa is a prime example that people of numerous or different nationalities can peacefully co-exist in harmony. The residents of these communities are busily engaged in a lot of commercial activities. The beauty about Kasoa is visible and appreciated in the cultural and religious diversity of the community.

3.4 Study Population

According to Ingleby (2012), a population is a group of individuals who have one or more characteristics in common and of an interest to the researcher. Agyedu, Donkor and Obeng, (2011) further explained that a population does not necessarily refer to people. According to them, a population refers to the complete set of individuals (subjects), objects or events having common observable characteristics in which the researcher is interested in studying.

The target population of this study was mainly pregnant women in Kasoa-Zongo Community. The population for this study as gathered from the records obtained from Kasoa Polyclinic in 2017 was made up 744 respondents of pregnant women who reported and registered for antenatal care services at the Kasoa Polyclinic between January 2016 and June 2017, as well as three (3) senior midwives and three (3) popular traditional health providers at Kasoa. This study included traditional health provider because some pregnant women may prefer the services of the traditional health providers in the community for various reasons.

3.5 Sample Size and Sampling Techniques

In any research, people, places, and things are studied. The opportunity to study the entire population of these people, places, and things is an endeavour that most researchers do not have the time and money to undertake (Latham, 2007). This, therefore, calls for sampling to arrest the difficulty of studying the entire population. A sample is a subset of the population and consists of individuals, objects or subjects that form part of the population. A single member of the population is referred to as a sampling unit, and a complete list of sampling units is the sampling frame (Agyedu, Donkor & Obeng, 2011). Owu-Ewie (2012) outlined six reasons for sampling in

research and they are: economy, time, manageable population size, inaccessibility of some population, and destructiveness of the observation. Another advantage of sampling is that it ensures a greater response rate. According to Solomon (2011), sampling is the process of selecting a subset of units or individuals from a population of interest so that by examining the sample, one can generalize the results to the whole population. In other words, it is the process of obtaining information about an entire population by examining only a part of it. That notwithstanding, the researcher employed a statistical model by Yamane (1964) to settle on the sample size at a 9% margin of error. The sample size for this study included the total number of households within the study area.

$$n = \frac{N}{1 + N(\partial^2)}$$

Where n= the sample size, N= the sample frame, 1= a constant, and $\partial = 0.09$

However, given that 744 pregnant women reported and registered for antenatal care services at the Kasoa Polyclinic between January 2016 and June 2017, including three (3) senior midwives and three (3) popular traditional health providers at Kasoa, therefore,

N = 744 + 3+ 3= **750**

$$n = \frac{750}{1+750(0.09^2)} = \mathbf{106}$$

In view of Guest, Bunce, and Johnson (2006), there is no specific threshold for selecting a sample size for any research population. However, Crouch and McKenzie (2006) argued that a higher sample size assures a reasonable representation of the study population. That notwithstanding, Crouch and McKenzie (2006) proposed that a minimum of 15 participants is good for a qualitative study, whereas any number

above 100 participants is good for quantitative study of 1000 population. Also, according to the ―useful guide for determining the sample size" by Israel (2013), a sample size of 100 is acceptable for a population of 20,000 at ±10% Precision. Therefore, a sample of 106 is a reasonable representation of a population of 750 people.

In this study, a combination of purposive, snowballing, and convenience sampling methods were adopted in selecting a total of 106 participants for the study. The 106 participants included 100 pregnant women, three health attendants (midwives) and three traditional health attendances. Firstly, 100 pregnant mothers were conveniently selected on antenatal clinic days for this study. Laerd (2012) viewed convenience sampling as one where the units that are selected for inclusion in the sample are the easiest to access. According to Sedgwick (2013), convenience sampling is the least rigorous technique, involving the selection of the most accessible subjects within a specific period of time. Sedgwick (2013) maintained that it is the least costly to the researcher, in terms of time, effort and money. Assessing these two definitions, it can be established that convenience sampling involves obtaining units or people who are most readily, easily and conveniently available. In this study, the researcher selected 100 expectant mothers who were present at antenatal clinic days and were willing to partake in this study.

Secondly, the researcher purposively handpicked three senior midwives as study participants on the basis of judgment of their suitability for the issue under investigation. The health workers were purposively selected because they were considered as key personnel who could formulate and implement prenatal, antenatal and postnatal services targeted at pregnant women. Also, the researcher relied on

three midwives, because at the time of the collection (between 2016 and 2017), Kasoa Polyclinic only had three (3) senior midwives.

Finally, snowballing sampling technique was employed to select the three traditional health providers in the community. This technique helped the researcher to access the few traditional health providers in the community. It is a kind of strategic method of sampling where the researcher collects data from few members of the target population that he/she is able to locate. The researcher then asks those individuals to provide information needed to locate other members of population (Agyedu, Donkor & Obeng, 2011). Snowballing sampling is useful when the information about a population is scanty (Wagner & Lee, 2014). Beauchemin and González-Ferrer (2011) viewed snowballing sampling as appropriate when the members of a special population are difficult to locate. The researcher contacted the first Herbalist and then he led the researcher to locate the others.

3.6 Instrumentation

A structured question was developed and used to collect data from the pregnant women. The reason was that most of the pregnant women could not read and write, therefore, a structured questionnaire was more appropriate. By using this instrument, the researcher had the opportunity to seek clarification from the respondents to ascertain their feelings and experiences of the various subject matter understudy.

3.6.1 Structured Questionnaire

The structured questionnaire was divided into four sections, that is _A, B, C and D'. Section _A' sought information on biographical data. The rest of the items (B, C and D) focused on pregnancy-related food taboos, the rate and reasons for adherence, and assessment of nutritional knowledge of the pregnant women in Kasoa Zongo community respectively.

This study adopted both close and open-ended items to collect data on pregnancy - related food taboos in order to answer the research questions. The close-ended items were those on background characteristics, the nutritional knowledge and the views on various issues (Likert scale). A four-point Likert-type items: Strongly Agree (SA) = 4), Agree (A) = 3), Disagree (D) = 2 and Strongly Disagree (SD) = 1. The items were built to reflect on the key themes raised in the research questions. The mean for the Likert scale was 2.5 (10/4). All statements with means more than 2.5was taken as agreement with the statements

In order to assess the level of nutritional knowledge, two types of short answer questions; namely, Completion and True or False were used. The responses were summed up to get each respondent's actual score. For the Completion test, a correct answer yields 2 marks, a partly correct answer yields 1 mark. This means the highest score any respondent could get in the five questions of the Completion test was 10. With regard to the True or False questions, each question answered correctly attracted 1 mark so the highest a respondent could score was 15. Wrong answers did not attract any scores, i.e. zero (0). The total scores for all the questions were 25 (100%).

Semantic differential questions were used to elicit respondents views on the reasons for adhering to food taboos during pregnancy, and to also measure the level of nutritional knowledge of the pregnant women in the community in order to answer researcher question two and three respectively. The semantic differential (SD) technique was originally developed by Osgood in 1957 to measure people's affective responses to stimulus words and concepts in terms of ratings of bipolar scales defined with adjectives on each end (Ploder & Eder, 2015). The semantic differential technique is considered a simple, economical means for obtaining data on emotional reactions that could be used in many different situations or cultural contexts. The goal of the current study is to use the semantic differential to evaluate the level of nutritional knowledge of the pregnant and the elderly women in the community.

3.7 Validity and Reliability of Instruments

3.7.1 Validity

Validity refers to the extent to which the research instrument serves the use for which it is intended (Zohrabi, 2013). Putka and Sackett (2010) discussed the test involved in validating any data in any social science research. They grouped them under construct validity, internal validity, external validity and reliability. Putka and Sackett (2010) explained that construct validity establishes correct operational measure for the concepts being studied; internal validity establishes a causal relationship, whereby certain conditions are shown to lead to other conditions; and external validity establishes the domain to which a study‘s finding can be generalized (Putka & Sackett, 2010). Zohrabi (2013) identified three basic approaches to the validity of tests and measures as shown by Mohamad, Sulaiman, Sern and Salleh (2015). These are content validity, construct validity, and criterion-related validity.

Content Validity

This approach measures the degree to which the test items represent the domain or universe of the trait or property being measured. In order to establish the content validity of a measuring instrument, the researcher must identify the overall content to be represented. Items must be chosen to accurately represent the information in all areas of the study. By using this method the researcher should obtain a group of items which is representative of the content of the trait or property to be measured (Putka & Sackett, 2010; Mohamad, Sulaiman, Sern & Salleh, 2015).

The content validity of the qualitative items for this study was thoroughly checked by two experts in the area of Food, Nutrition and Health as well as the research supervisor who scrutinized the items for their suitability before pre-test. All the necessary corrections in the items were made and were considered valid. Face validity was carried out by giving the instruments to colleague M.Phil students of Food and Nutrition in the Department of Home Economics, University of Education, Winneba (UEW) for scrutiny. Their comments and suggestions were considered for review of the questions.

Construct validity

The term construct in this instance is defined as a property that is offered to explain some aspect of human behaviour, such as mechanical ability, intelligence, or introversion (Zohrabi, 2013). The construct validity approach concerns the degree to which the test measures the construct it was designed to measure (Putka & Sackett, 2010; Mohamad, Sulaiman, Sern & Salleh, 2015). The Construct validity for this study was ensured by critically developing the items or questions within established theoretical framework.

3.7.2 Reliability of the research instruments

Mohamad, Sulaiman, Sern and Salleh (2015) defined reliability as the extent to which results are consistent over time and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable. To ensure reliability of the research instruments, a pre-test was conducted on 30 pregnant women who attended antenatal clinic at Agona-Swedru Government Hospital in June, 2016; two nurses and two traditional health providers at Agona Swedru were conducted. The result was subjected to Cronbach's alpha reliability analysis using Statistical Package for Social Sciences (SPSS) version 20.0 to determine the reliability coefficient (r) in order to establish the reliability of the instrument. A reliability coefficient (r) of 0.73 was obtained, and it is deemed as an acceptable measure of reliability because more than 0.70 the threshold value of acceptability is achieved as a measure of reliability (Zohrabi, 2013).

3.8 Data Collection Procedure

For ethical reasons, a letter of introduction from the Head of Department of Home Economics of the University of Education, Winneba was obtained to introduce the researcher during the data collection, after establishing the necessary contacts with the respondents. This letter was used to introduce as well as seek consent and permission from the District Director of Health Services; the Medical Superintendents in charge of health services at Kasoa Polyclinic. The researcher explained the purpose of the study and procedure for responding to the structured questionnaire to the study participants. Participants were assured of the necessary confidentiality and anonymity. The structured questionnaire was self-administered to the pregnant women just after they attended ANC services at the health facility settings. The study participants who were literates were given the structured questionnaire for self-completion. However,

those who were illiterates were assisted by the researcher who interpreted the questions to them in their local dialect; Hausa, Ga and Akan. The questions were read to them in the local dialect, and they responded. Their responses were ticked accordingly for them. The interview sessions were also carried on the selected interviewees on different days at their houses and place of work. English Language, Ga and Akan were used as mediums of communication. Some of the interview sessions were face-to-face, whereas telephone interviews were held with some of the midwives. This was done to ensure high coverage, completion, and return rate.

3.9 Data Analysis

Any collected data can be presented in different forms: narrative and tables (Privitera, 2015). Ingleby (2012) stated that before interpretation takes place, data should be displayed and presented. Responses given by the respondents to each set of items in the structured questionnaire were tallied in order to get the number of respondents who answered each set of items. The collected data were fed into the SPSS version 20 software for onward analysis. The Frequency and percentage distributions of responses were generated according to each research question raised, and this was presented in tables as frequencies, percentages, means, standard deviation and Pearson correlation analysis. The researcher also used the SPSS to run Pearson Correlation test to find the significant relationship between the independent variables (demographic variables) and the dependent variable (adherence to food taboos).

3.10 Limitations of the Study

Limitations of study are useful for readers because they acknowledge possible errors or difficulties in interpreting results of the study (Baron, 2010). The results of this study may not reflect the opinions of all pregnant women of the study population due

to the failure of some sample respondents to frankly answer questions. Information in this study could have been collected from a wider scope, to include pregnant women who attended antenatal clinics at various healthcare institutions outside Kasoa, and possibly pregnant women who attend antenatal from other sources aside clinics.

3.11 Ethical Considerations

Artal and Rubenfeld (2017) defined ethics in research as the discipline that study standards of conduct, such as philosophy, theology, law, psychology or sociology. In other words, it is a method, procedure or perspective for deciding how to act and for analysing complex problems and issues. Protection of participants and their responses were assured by obtaining informed consent, protecting privacy and ensuring confidentiality. In doing this, description of the study, the purpose and the possible benefits were mentioned to participants. The researcher permitted participants to freely withdraw or leave at any time if they deemed it fit. As a way of preventing plagiarism, all ideas, writings, drawings and other documents or intellectual property of other people were referenced indicating the authors, title of publications, year and publishers.

CHAPTER FOUR

RESULTS

4.1 Introduction

This study investigated the prevalence and adherence to food taboos associated with pregnancy in the Kasoa-Zongo community. This chapter presents the results of the analyses of the data collected. Section A presents the socio-demographic characteristics of the pregnant women in the sample and Section B presents results on the food taboos and beliefs associated with pregnancy in Kasoa-Zongo. Section C has the responses on the level of adherence to food taboos by the selected pregnant women in the community. Section D presents data on the nutrition knowledge of pregnant women in the sample while Section E focuses on the results on the alternative foods the pregnant women consume to replace the tabooed foods.

4.2 Socio-demographic Characteristics of the Selected Pregnant Women in Kasoa-Zongo

The socio-demographic characteristics of the selected pregnant women in Kasoa-Zongo information stresses on their ages, marital status, occupation, highest educational levels, religion, ethnicity, nationality and the stages of their pregnancy. Table 1 presents the results.

Table 1: Socio-demographic Characteristics of Pregnant Women in Kasoa-Zongo

Variable	Variable category	Frequency	%
Age in years	Less than 20	2	2.0
	20-29	45	45.0
	30-39	48	48.0
	More than 40	5	5.0
	Total	100	100
Marital status	Married	84	84.0
	Single (Never married, divorced widowed)	16	16.0
	Total	100	100
Occupation	Wage-employees (Civil servants, teachers, nurses, bankers)	28	28.0
	Traders	59	59.0
	Hairdresser, seamstresses	7	7.0
	Housewife	5	5.0
	Student	1	1.0
	Total	100	100
Highest level of education	No formal education	9	9.0
	Basic/Junior High School	29	29.0
	Second cycle	38	38.0
	Tertiary	24	24.0
	Total	100	100
Religion	Muslim	54	54.0
	Christian	38	38
	Traditionalist	8	8.0
	Total	100	100
Ethnicity	Hausa	25	25.0
	Dagomba	16	16.0
	Akan	15	15.0
	Mamprusi	13	13.0
	Gao/Zabrama	10	10.0
	Ewe	8	8.0
	Ga/Adangbe/ Guan/Efutu	7	7.0
	Fulani	6	6.0
	Total	100	100
Nationality	Ghanaian	75	75.0
	Non- Ghanaian	25	25.0
	Total	100	100
Continued from page 58			
Stage of pregnancy	1st trimester	30	30.0
	2nd trimester	36	36.0
	3rd trimester	34	34.0
	Total	100	100

Source: Field Data, 2017.

Table 1 shows that two percent (2.0%) of the pregnant mothers were less than 20 years of age. Forty-five (45.0%) of the pregnant women were between 20 and 29 years of age, 48 (48.0%) of them were within the 30 to 39 years age group, whereas five percent (5.0%) were within 40 years of age and above. The majority of the pregnant women in the sample, representing 84.0%, were married whereas 16.0% of them were single, i.e. either never married, separated, divorced or widowed.

With regard to occupation, the overall picture shows that 28.0% of the pregnant mothers were employed in the formal sector as civil servants, teachers, nurses and bankers. Out of the rest, 59 (59.0%) were self-employed in the informal sector as traders in foodstuffs, fish and manufactured products, while seven percent were hairdressers and seamstresses. Five of them were housewives with the remaining one percent being a student.

The highest educational levels of the women in the sample, as indicated in Table 1, reveal that 29.0% of the expectant mothers had basic education, 38 (38.0%) of them said they had secondary school certificates and 24 (24.0%) had completed tertiary institutions with degrees and diploma certificates from training colleges, colleges, polytechnic, universities in the country. Only nine percent (9.0%) of them never had any formal education.

Also, most of the pregnant mothers were Muslims (54.0%), 38.0% of them were Christians, whereas eight (8.0%) of them belonged to the traditional religion. A quarter of the pregnant women in the sample (25.0%) were Hausa, 16.0% were Dagombas, 15.0% were Akans and 13.0% were also Mamprusi. The Ewes and the Ga/Adangbe/Guan/Efutu indigenes formed 15.0% of the sample. The rest, being 16.0%, were 10.0% from the Gao/Zabrama tribe and the Fulani were 6.0%. It was

also established that the majority (75.0%) of the respondents were Ghanaians whereas a few of them (15.0%) were Non-Ghanaians.

On the stage of the pregnancy; 30 (30.0%) of the pregnant women were in the first trimester of pregnancy, 36.0% of them were in the second trimester, whereas 34.0% of them were in the third trimester.

4.3 Analysis of Research Questions

This section has the analyses of the data in order to answer the research questions for the study.

4.3.1 Research question 1: What are some of the food taboos and beliefs associated with pregnancy in Kasoa-Zongo community?

This Research question sought to find out how the pregnant women describe and conceptualize food taboos. It starts with question on foods that are considered as taboo for pregnant women. All the responses are presented in Table 2.

Table 2: Foods Considered as Taboo for Pregnant Women

Food	Frequency		
	Yes (%)	No (%)	Total
Snails	84.0	16.0	100
Ripe plantain	79.0	21.0	100
Mushrooms	73.0	27.0	100
Pork	68.0	32.0	100
Eggs	61.0	31.0	100
Fishes (mudfish)	58.0	42.0	100
Groundnut	56.0	44.0	100
Python	52.0	48.0	100
Tortoise	52.0	48.0	100
Duck	21.0	79.0	100
Goat	16.0	84.0	100

*Multiple choices
Source: Field Data, 2017.

Table 2 presents multiple responses on the pregnant women's awareness of taboos related to some foods. It is obvious from the responses presented in Table 2 that the majority of the respondents were aware of nine major pregnancy-related tabooed foods which are snails (84.0%), ripe plantains (79.0%), mushrooms (73.0%), pork (68.0%), eggs (61.0%), mudfish (58.0%), groundnuts (56.0%), python (52.0%), and tortoise (52.0%). Very few of the pregnant women in the sample being 21.0% and 16.0% had little or no awareness that duck and goat were considered as pregnancy-related taboo foods.

The Reasons why Pregnant Women Avoid Eating Some Prohibited Foods

The respondents were allowed to provide as many as the reasons why they avoided some foods during pregnancy. Table 3 presents the multiple responses to the reasons why pregnant women avoid eating some prohibited foods.

Table 3: Reasons why Pregnant Women Avoid Eating Some Prohibited Foods

Reason	Frequency	%
Religious belief	83	17.0
Prevention of miscarriage	79	16.2
Foods spiritually unwholesome	66	13.5
Taboo (ancestral taboo)	63	12.9
Baby born with watery/slimy mouth	59	12.1
Prevention against prolonged labour	58	11.9
Allergies and malformation	46	9.4
Depression	34	7.0
Total	488*	100

*Multiple Responses

Source: Field Data, 2017

It can be observed from the data in Table 3 that most of the pregnant women stopped eating prohibited foods for the reasons being: Religious belief (17.0%) prevention of

miscarriage (16.2%), foods being spiritually unwholesome (13.5%), ancestral taboo was 12.9%. Prevention of having a baby born with watery/slimy mouth had (12.1%), prevention against prolonged labour (9.4%) and allergies and malformation of foetus was (9.4%). Depression had the least percentage (7.0%).

Self-Restricted Foods during Pregnancy

It was noticed during the interview and also from casual discussions with the respondents that there were some foods that were not necessarily food taboos which the pregnant women restricted themselves from eating or avoided during pregnancy. There was a need therefore to find out what these foods were. Table 4 has a list of those foods.

Table 4: Self-Restricted Foods during Pregnancy

Food	Multiple Responses	
	Frequency	%
Sugarcane	83	15.3
Coconut	81	14.9
Pawpaw	75	13.8
Pineapple	72	13.3
Okro	66	12.2
Milo	47	8.7
Palm kernel oil	42	7.7
Sugary foods	41	7.6
Beans	35	6.5
Total	542*	100

*Multiple Responses

Source: Field Data, 2017.

Table 4 presents the dichotomous responses on self-restricted or avoided foods by some pregnant women during pregnancy. The majority, being 15.3% avoided sugarcane, 14.9% avoided coconut, 13.8% avoided pawpaw, 13.3% avoided

pineapple and 12.2% avoided okro. The rest of the responses show that 8.7% also avoided palm kernel oil, 7.7% avoided sugary foods and (6.5%) avoided beans.

The responses as narrated by the Midwives, Nurses and Herbalists are represented below;

> –Yes, most of the pregnant women are aware of food taboos associated with pregnancy. They comply with them too. The foods are the forbidden foods for pregnant women". (**Midwife 1)**
>
> –People are forbidden or not allowed to eat the tabooed foods at certain periods, especially during pregnancy in order to avoid complications and dangers. These foods are not allowed to be eaten due to their effects on the foetus or unborn child, the expectant mother, and the human body as a whole". **(Midwife 1)**
>
> –Some believe that bad people may cast evil eyes on the pregnancy through pawpaw. There is also some fear concerning snails. They belief that snails make babies have a watery/slimy mouth. Ok! Some comply with it because of personal dislike for milk, eggs and coconut". (**Midwife 2)**
>
> –I do. I have been practicing herbal medicine for the past 19 years. I have in-depth knowledge of food taboos associated with pregnancy. Surely, I offer my services to pregnant women in this community. Food taboos are foods which are forbidden for pregnant women for safety reasons. Yes, foods like sugarcane, groundnut, oranges, roasted corn, ripe plantain, banana and coconut are forbidden foods for pregnant women". **(Male herbalist)**
>
> –Yes, I have a rich knowledge on food taboos associated with pregnancy because I have been practicing traditional or herbal medicine for 30 years. Foods such as ripe plantain, pawpaw and sugary foods usually cause miscarriages. When a pregnant woman eats more of snails, she is likely to give birth to a baby with watery mouth". (**Female herbalist 2**)
>
> –The reason for the prohibition will depend on the type of the tabooed food. For instance, in order to prevent miscarriages pregnant women must avoid foods like sugarcane, ripe plantain, okro, and banana. Avoidance of groundnut, roasted corn and oranges will help prevent lower abdominal pains during the first trimester of the pregnancy. It is believed that when a pregnant woman eats a lot of snails, she is likely to have a baby with watery mouth". (**Female herbalist**)

Reasons for Self-Restricted Foods during Pregnancy

Usually, there are obvious reasons why people do certain things or take certain actions. The pregnant women in the sample were therefore asked to give their reasons for the self-restricted or for avoiding the listed foods. Their reasons are presented in Table 5.

Table 5: Reasons for Self-Restricted Foods during Pregnancy

Reason	Frequency	%
Miscarriage	30	30.0
Heartburn, lower abdominal pain	23	23.0
Constipation	12	12.0
Fatty baby and difficult delivery	11	11.0
Allergies (itching throat)	10	10.0
Malformation/Foetal abnormality	10	10.0
Skin and respiratory problems	4	4.0
Total	**100**	**100**

Source: Field Data, 2017.

Data in Table 5 indicate the reasons for the personal restrictions of some foods during pregnancy. The following ailments were outlined by the pregnant women in this study as being the reasons why they usually stop eating some foods during pregnancy: Miscarriage (30.0%), heartburns and lower abdominal pain (23.0%), constipation (12.0%), fatty babies that result in difficult delivery (11.0%), allergies such as itching throat (10.0%), malformation/foetal abnormality (10.0%) and lastly skin and respiratory problems.

Sources from which the Pregnant Women got the Awareness of Food Taboos

The pregnant women in the sample were asked to indicate the sources from which they got the awareness of the food taboos. Their responses are presented in Table 6.

Table 6: Source of Knowledge of Food Taboos

Source	Frequency	%
Mosque/Church	31	31.0
Grandparent	24	24.0
Herbalist	21	21.0
Parents	17	17.0
Self	7	7.0
Total	**100**	**100**

Source: Field Data, 2017.

A critical examination of Table 6 shows that the pregnant women had knowledge and awareness mostly from mosque/church (31.0%), grandparents (24.0%), herbalists (21.0%) and parents (17.0%). The least source of knowledge of pregnancy food taboos was personal knowledge and/or self-awareness, which was given by seven percent of the respondents.

Reasons/Motives Why Pregnant Women Did Not Eat Taboo Foods

Just as the pregnant women were asked to give reasons for avoiding tabooed foods, they were again asked to indicate the rationale hind why they do not eat taboo foods. Their responses are presented in Table 7.

Table 7: Reasons/Motives Why Pregnant Women Did Not Eat Taboo Foods

Reason/motives	Frequency	%
Health	45	45.0
Religion	42	42.0
Security	13	13.0
Total	**100**	**100**

Source: Field Data, 2017.

Table 7 gives information on the reasons why the pregnant women did not eat forbidden or taboo foods. A majority number (45.0%) of the pregnant women did not eat taboo foods for health reasons. This was followed by 42.0% of the respondents

who did not eat taboo foods for religious reasons, and the least (13.0%) reason for not eating the taboo food was security.

4.3.2 Research Question 2: To what extent do the pregnant women in the community adhere to the food taboos?

The data for this research question was obtained from responses to questions 15 and 16 in the structured questionnaire. The percentage, mean standard deviation value were computed for each statement. Using SPSS 16.0 program, the responses were coded under a 4-point Likert scale as 4 = strongly Agree, 3 = Agree, 2 = Disagree and 1 = strongly Disagree. The mean score for the Likert scale is 2.5 (i.e. 4 + 3 + 2 +1 = 10/2 = 2.5) Thus, all responses above 2.5 indicates agreement with the statement, while all those below 2.5 indicates disagreement with the statement. The mean illustrates the average value of the observation. It also indicates which statement attracted the higher affirmation by the pregnant women and which one did not. On the other hand, the standard deviation measures the precise extent or how concentrated the data (observation) vary around the mean; the more concentrated, the smaller the standard deviation. Table 8 gives an overview of the level of adherence with the food taboos.

Table 8: Level of Adherence to the Tabooed Foods

Statement	Strongly Agree No (%)	Agree No (%)	Disagree No (%)	Strongly Disagree No (%)	Mean	SD
I sometimes doubt the consequences of the taboos	46 (46.0)	28 (28.0)	15 (15.0	11 (11.0)	3.09	.832
I often crave for the foods I was tabooed/prohibited/restricted from eating	34 (34.0)	42 (42.0)	14 (14.0)	10 (10.0)	3.0	.722
Food taboos/ restrictions/ prohibition are important to any pregnant woman	44 (44.0)	20 (20.0)	19 (19.0)	17 (17.0)	2.91	.778
I obey food taboos as a pregnant woman strictly	27 (27.0)	31 (31.0)	23 (23.0)	19 (19.0)	2.66	.721
It is very difficult to abide/follow food taboos /prohibited /restricted foods	15 (15.0)	44 (44.0)	26 (26.0)	15 (15.0)	2.59	.676
I have unintentionally eaten some of the foods I was tabooed /prohibited/ restricted from eating	16 (16.0)	36 (36.0)	35 (35.0)	13 (13.0)	2.55	.693
There are some benefits I derive from pregnancy related food taboos	14 (14.0)	40 (40.0)	27 (27.0)	19 (19.0)	2.49	.680
I feel normal about the food prohibition as a pregnant woman	13 (13.0)	24 (24.0)	45 (45.0)	18 (18.0)	2.02	.668

Source: Field Data, 2017.

*SD= Standard Deviation

The data presented in Table 8 reveal that the respondents agreed with six out of the eight statements on adherence. This is because the six statements had means ranging from 2.55 to 3.09, which are all higher than 2.5. Again, 76.0% of the pregnant women agreed that they sometimes craved for the foods that they were tabooed/prohibited/restricted from eating. This attracted the second highest mean score of 3.0 and a standard deviation score of 0.722.

Table 8 further reveals that 61.0% of the respondents agreed that food taboos/restrictions/ prohibitions are important to any pregnant woman a mean score of 2.91. While 59.0% of the respondents said that they obeyed food taboos, 41.0% confessed that they did not obey the food taboos strictly and 52.0% of the pregnant women felt there are some benefits I derived from pregnancy-related food taboos. Finally, the statement that had the least mean score in Table 8 was ―I feel normal about the food prohibitions as a pregnant woman". Most of the women, forming 63.0% of the pregnant women disagreed, indicating that they did not feel normal about the food prohibitions.

Also, this result is supported by some of the midwives and herbalists who were interviewed in the cause of this study. Their responses are as follows:

> ―Yes, most of them adhere to food taboos. I can't really tell the reasons for their adherence to this food taboos. They may have their reasons. (**Midwife 1)**
>
> ―Well, some said they are not supposed to eat snails, coconut, banana, oranges, mushrooms, pawpaw and even eggs. So, they comply with the food taboos. Hmmm! they believe pawpaw can cause miscarriage. Ok. Foods like sugarcane, groundnut, oranges, roasted corn and sometime sugary foods are not supposed to be eaten by pregnant women". **(Midwife 2)**
>
> ―Yes, pregnant women are prevented from eating these foods for their own good and that of their babies. Some women suffer from lower abdominal pains during their first trimester. I advise them to avoid

foods like groundnut, roasted maize, oranges and sugarcane". (**Midwife 3)**

"Yes, some of the pregnant women adhere to this food taboos. It is because they are concerned about their health and that of their babies". **(Male herbalist)**

"Yes, some of the pregnant women adhere to this food taboos. Their reasons for adherence to these food taboos are because people are becoming very conscious with their health these days and also because pregnancy comes with a lot of complications sometimes, therefore people listen to their health providers". (**Female herbalist**)

"Yes, I do consider the nutritional needs of the pregnant women. As matter of fact I encourage them to eat well regularly for healthy pregnancy". **(Female herbalist 2)**

Table 9: Response on Whether Pregnant Women Comply with Food Taboos or Prohibitions Permanently or Temporary during Pregnancy Only

Level of adherence	Frequency	%
Permanently	56	56.0
Temporary during Pregnancy	44	44.0
Total	**100**	**100**

Source: Field Data, 2017.

The majority (56.0%) of the pregnant women complied with the food taboos permanently, whereas 44.0% of them did so temporarily during the period of pregnancy only.

4.3.3 Research question 3: What is the level of knowledge on nutrition among the pregnant women in the community?

As part of the study of objectives of this study, it was imperative to find out the nutrition knowledge of the pregnant women. The motive or rationale is to examine whether the level of knowledge on nutrition has any impact on how the pregnant women avoid taboo foods. The data for this research question was obtained from responses to questions 15 and 35 of the structured questionnaire (see Appendix A).

The result for this segment was presented in three (3) tables (Table 10a, Table 10b and Table 10c).

Nutritional Knowledge of the Pregnant Women (A)

The data for Table 10a was obtained from question 15 to 19 of the structured questionnaire (see Appendix I). The respondents were required to supply their own answers or fill in the black spaces as provided in the question. The answers provided by the respondents were evaluated based on a marking scheme prepared by the researcher (see Appendix E).

Table 2a: Nutritional Knowledge of the Pregnant Women

Statement	Correct Response No (%)	Partly Correct No (%)	Wrong/Don't know No (%)	Mean
1. A pregnant woman should have some form of exercise in order to.....	59 (59.0)	13 (2.0)	28 (28.0)	1.31
2. Adequate weight maintenance in pregnancy is important because.....	45 (45.0)	31 (31.0)	24 (24.0)	1.21
3. The importance of folic acid supplement given to pregnant women during pregnancy is to.....	34 (34.0)	48 (48.0)	18 (18.0)	1.14
4. Protein-rich foods are very vital for pregnant women, especially during the first two trimesters because.....	21 (21.0)	37 (37.0)	42 (42.0)	0.79
5. Intake of animal fat should be reduced during pregnancy in order to prevent.....	29 (29.0)	17 (17.0)	54 (54.0)	0.75

Source: Field Data, 2017

An examination of the data presented in Table 10a indicate that out of the five Completion questions, only one of the questions which stated that a pregnant woman should have some form of exercise that had 59.0% of the respondents getting the fully correct answer. The respondents who had full scores in the remaining four questions were all below the minimum score of 50.0%. These were ―The importance of adequate weight maintenance in pregnancy" (45.0%); ―The importance of folic acid supplement given to pregnant women" (34.0%); the importance of protein-rich foods to pregnant women" (21.0%); and the fact that ―Intake of animal fats should be reduced during pregnancy" (29.0%). The means of the statements ranged between 0.75 to 1.31

Nutritional Knowledge of the Pregnant Women (B)

The data for Table 10b was obtained from question 20 to 35 of the structured questionnaire (see Appendix I). The respondents were required to demonstration their knowledge on nutrition by indicate True or False to statement provided in the Table 10 below. Similar to Table 10a, the answers provided by the respondents was evaluated based on a marking scheme prepared by the researcher (see Appendix E).

Table 10b: Nutritional Knowledge of the Pregnant Women

Statement	True No (%)	False/Don't know No (%)	Mean No (%)
1. Pregnant women should not eat non-food items such as clay	78 (78.0)	22 (22.0)	0.78
2. Personal hygiene is important in pregnancy in order to prevent infections/diseases	72 (72.0)	28 (28.0)	0.72
3. At least six hours of sleep is adequate for pregnant women.	67 (67.0)	33(33.0)	0.67
4. Herbal teas should be taken with caution since they may be unsafe	57 (37.0)	43 (43.0)	0.57
5. It is unsafe to eat fresh vegetables and fruits that have been sprayed with pesticide, even after they have been washed	56 (56.0)	44(44.0)	0.56
6. Pregnant women must avoid sweetened foods and beverages throughout the period	49 (49.0)	51 (51.0)	0.49
7. Pregnant women should avoid raw meat, fish, poultry raw eggs and unpasteurized dietary products	48 (48.0)	52 (52.0)	0.48
8. As a rule, all pregnant women must eat three square meals per day	47 (47.0)	53 (53.0)	0.47
9. The mineral elements which strengthen foetal bones include potassium.	44 (44.0)	56(56.0)	0.44
10. Green leafy vegetables help to prevent anaemia in pregnancy.	39 (39.0)	61 (61.0)	0.39
11. Fried, fatty foods cause heartburns during pregnancy	39 (39.0)	61 (61.0)	0.39
12. Any form of exercise during pregnancy is desired	35 (35.0)	65 (65.0)	0.35
13. Pregnant women must resist excess salt intake	32 (32.0)	68 (68.0)	0.32
14. Foods that cause food-borne diseases can always be detected by changes in appearance, smell or taste	32 (32.0)	68 (68.0)	0.32
15. Dairy foods provide calcium for pregnant women.	31(31.0)	69(69.0)	0.31

Source: Field Study, 2017

Table 10b presents the results of the second part of testing the respondents' nutritional knowledge using True/False questions. In five of the statements, more than 50.0% of the respondents said the statements were true. These statements were: _Pregnant women should not eat non-food items such as clay' (78.0%); _Personal hygiene is important in pregnancy in order to prevent infections/diseases' (72.0%); _At least six

hours of sleep is adequate for pregnant women‘ (67.0%); _Herbal teas should be taken with caution since they may be unsafe is important (57.0%); and _It is unsafe to eat fresh vegetables and fruits that have been sprayed with pesticide, even after they have been washed‘ (56.0%).

For the remaining 10 statements, those who did not know or thought they were wrong more than half in each case. There were three statements that very few respondents said they were true. These were: _Pregnant women must resist excess salt intake‘ (32.0%); _Foods that cause food-borne diseases can always be detected by changes in appearance smell or taste‘ (32.0%), and _Dairy foods provide calcium for pregnant women (31.0%). On the whole, the means for all the statements are less than 1, indicating that the means are all closely dispersed.

Level of Nutritional Knowledge

The total score for all the questions was 25 (100%) and so the scores for all the respondents were converted into percentages and then grouped into three levels, which are Good, Fair and Low levels of nutritional knowledge. All scores ≤49% were low knowledge, 50% to 69% being fair, and those scores above ≥70% being good nutritional knowledge. The classification of the levels of nutritional knowledge can be seen in Table 10c.

Table 10c: Nutritional Knowledge of the Pregnant Women

Level of nutrition knowledge	Frequency	Percent
High (≥ 70)	20	20.0
Fair (50- 69)	38	38.0
Low (≤ 49)	42	42.0
Total	**100**	**100**

Source: Field Data, 2017

The findings, as presented in Table 10c, indicate that 20.0% of the respondents had good nutritional knowledge with the scores being 70.0% and above. Thirty-eight percent of the pregnant women had fair nutritional knowledge with scores ranging from 51.0% to 69.0%. Thirty-two percent of the respondents were found to have low nutritional knowledge, with their scores ranging from 40.0% and below. This means that just a little over half of the respondents (58.0%) had good or fair knowledge of nutrition issues.

Sources of Nutritional Knowledge for Pregnant Women

The next issue of interest in the study deals with the sources from which the pregnant women in the study derived their knowledge on nutrition. Table 11 has the details.

Table 11: Sources of Nutritional Knowledge for Pregnant Women

Sources	Frequency	%
Hospital/antenatal clinic	52	52.0
Church/Mosque	27	37.0
Media (TV, Radio)	13	13.0
Traditional birth attendants, herbal practitioners	8	8.0
Total	**100**	**100**

Source: Field Data, 2017.

Most of the pregnant women, forming 52.0% had information and knowledge of food and nutrition from the hospitals as they attended antenatal clinics. A few 27.0% of respondents had information on nutrition from church or mosque, Media (TV, Radio, etc) had 13.0%, and other sources such as traditional birth attendants and herbal practitioners eight percent.

Research question 4: What are the alternative foods the pregnant women consume to replace of the tabooed foods?

The data for this research question was obtained from responses to questions 36 of the structured questionnaire and interview question.

Table 12: Alternatives Foods Consumed by the Pregnant Women

Replaced food	Frequency	%
Herrings	72	11.6
Salmon	65	10.4
Agushie (melon seeds stew)	60	9.6
Chicken	59	9.5
Grapes	56	9.0
Cocoyam leaves stew/Palava sauce	55	8.8
Water melon	52	8.3
Margarine	47	7.5
Local farmers' cheese (Wagashie)	42	6.7
Pear	41	6.6
Millet	39	6.3
Banana	35	5.6
Total	**623**	**100.0**

Source: Field Data, 2017
*Multiple choices

Table 13 presents information on alternative foods which were eaten in place of the prohibited foods. This study found that herrings (11.6%), salmon (10.4%), and *agushie* (melon seeds) (9.6%) were the most eaten food during pregnancy. The rest were chicken (9.5%), Cocoyam leaves stew/palava sauce had 8.8%, Local farmer cheese (*Wagashie*) 6.7% and millet 6.3%.

Reasons Why the Pregnant Women Consumed the Alternative Foods

The results on the reasons why the pregnant women consumed the alternative foods is presented in Table 13. A four-point Likert scale was used to find out the level of agreement or disagreement with reasons for eating the alternative foods.

Table 13: Reasons Why the Pregnant Women Consumed the Alternative Foods

Reasons	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Mean
The replaced foods contain equal amount of nutrients as the tabooed foods.	41 (41.0)	33 (33.0)	15 (15.0)	11 (11.0)	3.04
The alternative foods are readily available in the community	29 (29.0)	50 (50.0)	13 (13.0)	8 (8.0)	3.00
I am comfortable eating the replaced foods instead of the tabooed ones	24 (24.0)	51 (51.0)	17 (17.0)	8 (8.0)	2.91
The alternative foods are affordable	20 (20.0)	56 (56.0)	14 (14.0)	10 (10.0)	2.86

Source: Field Data, 2017

The reason given by nearly three-quarters (74.0%) of the pregnant women as indicated in Table 13 is that the replaced foods contain equal amounts of nutrients as the tabooed foods. Also, 75.0% pregnant women affirmed that they were comfortable eating the replaced foods and 76.0% of them preferred the tabooed foods for the affordability. A greater number (79.0%) of the pregnant women admitted that the alternative foods were readily available in the community. All the reasons given have higher means than the general mean of 2.5 i.e. 2.86 to 3.03) and so it means that the pregnant women agreed with all the statements.

The interview with the health personnel and herbalists confirmed the results from the table. Their responses are as follows;

> –Ooh yes, I am able to advise pregnant women to consider eating other foods as a replacement of the tabooed ones. And like I said earlier, some of the women even tell us what they eat instead of why they do not eat". (**Midwife 1)**

> –Well, I think it is quite difficult erasing people's beliefs on these taboos. However, as Ghanaians we are blessed with varied food stuffs. So, in view of this, I will appeal to our cherished pregnant women to

try as much as they can to choose alternative foods to replace the said tabooed ones in order not to deprive themselves of essential nutrients especially in their condition. ” (**Midwife 2)**

My advice is that pregnant women should take good care of themselves to ensure healthy pregnancy and safe delivery”. (**Midwife 3**)

–My final comment is that a pregnant woman should take good care of themselves to ensure healthy pregnancy and safe delivery.” (**Male herbalist**)

–Yes, I do advise pregnant women to consider eating other foods as a replacement of the tabooed ones. Foods like plantain and yam boiled with *kontomire* stew is good for them. Fruits like water melon, pineapple can also be consumed. They should also include turkey berries (*kantoose*) in their foods. Snails can be replaced with crabs and periwinkles”. (**Female herbalist**)

–Foods like rice, plantain and yam sliced with *kontomire* stew are good for pregnant women. *Fufu. banku, tuo zaafi, akple* with soups are all good for them too. Snails can be replaced with crabs and periwinkles (kiss me). Also, water melon is a good fruit for pregnant women”

(**Female herbalist 2**)

4.4 Testing of Hypotheses

The background characteristics of the pregnant women in the sample were tested against their levels of adherence to the food taboos. The reason behind the tests was based on the assumption that the women‘s level of adherence to food taboos could be influenced by their personal background characteristics. Pearson Correlation Analysis was used to determine the significant relationship between educational, religious, nutrition knowledge, age of the pregnant women and the stage of pregnancy and the differences among the pregnant women and their levels of adherence to food taboos. The Pearson Correlation results are presented in Tables 4.14, to 4.18 respectively.

Null Hypothesis 1: There is no significant relationship between the educational level of the pregnant women and adherence to food taboos.

The purpose of this hypothesis to test the relationship between the level of education of the pregnant women and their level of adherence to food taboos. In doing so, the result from Table 14 on respondents' level of education was matched against the results in Table 8 on the respondents' level of adherence to the tabooed foods using Pearson Correlation analysis. The outcome of this analysis is presented in Table 14.

Table 14: Pearson Correlation Analysis between the Level of Education of Pregnant Women and their Level of Adherence to Food Taboos

		Level of Education	Level of Adherence To Food Taboos
Level of education	Pearson Correlation	1	-.643
	Sig. (2-Tailed)		.091
	N	100	100
Level of adherence to food taboos	Pearson Correlation	-.643	1
	Sig. (2-Tailed)	.091	
	N	**100**	**100**

Source: Field data, 2017.

The Results from the Pearson Correlation analysis score (-0.643), shows a negative relationship between the two variables with a significance of 0.091. This is an indication that there is a significant relationship between the adherence to food taboos and the level of education among pregnant women. Hence, the null hypothesis which states that is no significant relationship between the educational level of the pregnant women and their adherence to food taboos is rejected.

Null Hypothesis 2: There is be no significant relationship between religion of the pregnant women and adherence to food taboos.

This hypothesis was formulated to measure the influence of religion on the adherence to food taboos. In other words, this hypothesis is examines whether religion has any influence on the pregnant women level adherence to food taboos. To calculate the

Pearson Correlation analysis, the result from Table 1 on respondents' Religion was matched against the results in Table 8 on the respondents' level of adherence to the tabooed foods using Pearson Correlation analysis. The outcome of this analysis is presented in Table 15.

Table 15: Pearson Correlation Analysis between the Religion of the Pregnant Women and Their Level of Adherence to Food Taboos

		Religion	Level of adherence to food taboos
Religion	Pearson Correlation	1	.516
	Sig. (2-Tailed)		.361
	N	100	100
Level of adherence to food taboos	Pearson Correlation	.516	1
	Sig. (2-Tailed)	.361	
	N	**100**	**100**

Source: Fieldwork data, 2017.

Table 15 presents the results of the test of the relationship between religions of the pregnant woman as against their level of adherence to food taboos. The result showed Pearson Correlation of (0.516) at a Sig. of (0.361). This implies that there is a significant positive but moderate interactive relation between religious attribute or status and adherence to food taboos. Hence, the $\mathbf{H_o}$ which states that there will be no significant relationship between the religion of the pregnant women and adherence to food taboos is rejected. The Significance level of 0.361 indicates 64.0% accuracy that the Pearson Correlation score of 0.516 did not happen by a mere chance or a coincidence. It is clear that the spiritual or religious status of a pregnant woman significantly influences adherence to food taboos, all things being equal. This means that the religious beliefs of the pregnant women have a positive effect on their level of

adherence to food taboos. Thus, a pregnant Muslim is likely to consider certain foods as taboos based on her religious beliefs and teachings, likewise the Christian and the traditionalist. This result further indicates that pregnant women with strong or higher religious background are likely to have high level of adherence to food taboos, whereas those with lower religious background are likely to have a lower level of adherence to food taboos.

Null Hypothesis 3: There is no significant relationship between the educational level of the pregnant women and their level of knowledge on nutrition.

Hypothesis 3 tested the relationship between the level education and nutrition knowledge of the pregnant women. To calculate this, the respondents' response on their level of education in Table 1 was matched against the results on the nutrition knowledge in Table 10a and 10b, using Pearson Correlation analysis. The outcome of this analysis is presented in Table 16.

Table 16: Pearson Correlation Analysis between the Educational Level of the Pregnant Women and Their Level of Knowledge on Nutrition

		Level of Education	Level of Knowledge on Nutrition
Level of education	Pearson Correlation	1	.503
	Sig. (2-Tailed)		.005
	N	100	100
Level of Knowledge on Nutrition	Pearson Correlation	.503	1
	Sig. (2-Tailed)	.005	
	N	**100**	**100**

Source: Fieldwork data, 2017.

Table 16 presents the result of the hypothesis to test the relationship between level of education of the pregnant woman and their level of nutritional knowledge. The result yielded a Pearson Correlation value of 0.503 at a Significance Level of 0.05. This indicates that there is a significant positive interactive relation between the levels of education of the pregnant women and their level of knowledge on nutrition.

Hence, the $\mathbf{H_0}$ which states there will be no significant relationship between the educational level of the pregnant women and their level of knowledge on nutrition is rejected. The Significance of (0.005) signifies 95.0% accuracy that the Pearson Correlation score of (0.503) did not happen by a mere chance or a coincidence. This means that the educational level of the pregnant women have a significantly positive effect on their level of nutritional knowledge. Thus, this implies that pregnant women with higher educational level are likely to have high nutritional knowledge, whereas those with lower level of level of education background are likely to have a lower level of nutritional knowledge. Consequently, this observation further suggests that pregnant women with tertiary level of education are likely to have higher level of knowledge on nutrition, whiles those with basic level of knowledge have less or lower level of knowledge on nutrition.

Null Hypothesis 4: There is no significant relationship between the ages of the pregnant women and adherence to food taboos.

This hypothesis tested the relationship between the ages of the pregnant women and adherence to food taboos. To calculate this, the age of the respondents in Table 1 was matched against their responses on the level of adherence to the tabooed foods in Table 8, using Pearson Correlation analysis. The outcome of test is presented in Table 17.

Table 17: Pearson Correlation Analysis between Age of Pregnant Women and their Level of Adherence to Food Taboos

		Age	Level of adherence to food taboos
Age	Pearson Correlation	1	.133
	Sig. (2-Tailed)		.005
	N	100	100
Level of adherence to food taboos	Pearson Correlation	.133	1
	Sig. (2-Tailed)	.005	
	N	**100**	**100**

Source: Field data, 2017.

Table 17 presents the results of the test of the relationship between the ages of the pregnant woman as against their level of adherence to food taboos. The result showed Pearson Correlation of (r=0.133) at a Sig. of (p = 0.005). This signifies a positive but very weak interactive relation between the age distribution of the pregnant women and their adherence to food taboos. Consequently, the $\mathbf{H_o}$ which states that there will be no significant relationship between the ages of the pregnant women and adherence to food taboos is rejected.

Null Hypothesis 5: There is no significant relationship between the stages of pregnancy of the pregnant women and adherence to food taboos.

This hypothesis was used to test the relationship between the stages of pregnancy and nutrition knowledge of the pregnant women. This is to this examines whether the stages of pregnancy of the pregnant women have any influence on their level of adherence to tabooed foods. To calculate this, the respondents‘ response on their stages of pregnancy in Table 1 was matched against their responses on the level of adherence to the tabooed foods in Table 8, using Pearson Correlation analysis. The outcome of this analysis is presented in Table 18.

Table 18: Pearson Correlation Analysis between the Stages of Pregnancy of the Pregnant Women and Their Level of Adherence to Food Taboos

		Stage of pregnancy	**Level of adherence to food taboos**
Stage of Pregnancy	Pearson Correlation	1	.293
	Sig. (2-Tailed)		.001
	N	100	100
Level of adherence to food taboos	Pearson Correlation	.293	1
	Sig. (2-Tailed)	.001	
	N	**100**	**100**

Source: Field data, 2017.

Table 18 presents the test results of the Pearson Correlation Analysis between the stages of pregnancy of the pregnant woman as against their level of adherence to food taboos. The result showed Pearson Correlation of (r = 0.293) at a Sig. of (p = 0.001). This signifies a positive but weak interactive relation between the stages of pregnancy and adherence to food taboos. The stages of pregnancy are also noted as the gestation periods. A woman is considered to be in the first, second or third trimester when they are 0-12 weeks, 13-28 weeks and 29-40 weeks pregnant respectively. Therefore, the results from Table 18 reveals that pregnant women within their 3rd trimester (29-40 weeks of pregnancy) are likely to adhere more to food taboos than those within their first trimester (0-12 weeks of pregnancy). This implies that the higher the trimester, the higher level of adherence to food taboos, Hence, the $\mathbf{H_o}$ which states that there will be no significant relationship between the stages of pregnancy and adherence to food taboos is rejected. The Significance of 0.001 indicates 99.0% accuracy that the Pearson Correlation scores of 0.293 did not happen by a mere chance or a coincidence.

CHAPTER FIVE

DISCUSSIONS OF THE FINDINGS

5.1 Introductions

This Chapter outline the discussion on the findings of the research work.

5.1 Socio-demographic Characteristics of the respondents

The results of this study show that over 93.0% of the expectant mothers were of child bearing age or in the reproductive age group, which is 15-49 years of age. However, two percent (2.0%) of them were teenage pregnant mothers, and five (5.0%) of them were forty years and above. These ages have implications for pregnancy complications. A research finding by Hoffman, Jeffers, Carter, Duthely, Cotter and González-Quintero in 2007 revealed that women who go through pregnancy at a younger age (15-20) and pregnant women who are 40 years and older are at greater risk of ischemic stroke, hemorrhagic stroke, heart attack, and death from cardiovascular disease. Another research by de-Vienne, Creveuil and Dreyfus (2009) found that risk of maternal mortality increases with age, and that older women are more likely to greater pregnancy complications than the younger women. According to them, these complications may include premature birth, increased risk for miscarriage, high blood pressure, gestational diabetes, placenta previa, breech positioning of the baby, emergency caesarean delivery, postpartum haemorrhage, preterm birth, low or high birth and difficult labours (de-Vienne et al., 2009).

More so, in this study, 84.0% of the pregnant women were married women. The problem of unmarried young pregnant women often poses a lot of hardships to their parents and the women themselves in trying to feed and clothe themselves and other close relatives, particularly if they are unemployed. However, it is good to find out in

this study that 94.0% of the selected pregnant women were working, meaning they could have meals for the period of their pregnancy. It is hoped that the five housewives are being properly cared for by their spouses. The period of pregnancy has a lot of accompanying emotional as well as physical stresses that need the support of the spouses. One of the pregnant women was a student and so there could be an emotional stress for her from her parents and ridicule from colleagues. She definitely might need support from the parents.

This study also found that a significant number (72.0%) of the expectant mothers were either self-employed as artisans, or women in income generating activities or unemployed housewives, but few were students. It is likely that this category of the pregnant mothers had low-income status. This means that the expectant mothers who adhere to the food taboos might not be able to buy quality alternative foods to replace the tabooed once, which will affect them negatively.

The data revealed that between 75.0% and 76.0% of the pregnant women had low level of education (basic, secondary and non-formal education), whereas just about 24.0% of the pregnant women had tertiary level formal education. The implication is that the information seeking behaviour with regards to nutritional knowledge by those pregnant women might be relatively poor, which might have had influence on their compliance or adherence to pregnancy-related food taboos. Again, the low educational could affect their choice of healthy foods, as well as nutritional or dietary practices. This inference affirms Caulfield‘s (2005) assertion that less than high school education affects women‘s food choice when they become pregnant.

5.2 Research Question One:

What are some of the food taboos and beliefs associated with pregnancy in Kasoa-Zongo Community?

This question sought to find out how the pregnant women describe and conceptualize food taboos. It was found out that the majority of the respondents were aware of six major pregnancy-related tabooed foods, which are snails, ripe plantains, mushrooms, pork, eggs and mudfish. At least a respondents in this study admitted avoiding one food or the other in pregnancy based on the associated food taboos. This is consistent with the findings of Biza-Zepro (2015) that at least one half (49.8%) of women living in the (shashemene) district of Ethiopia had encountered food taboos at least for one food item. food items that were avoided by the pregnant women in Ethiopian, as found by Biza-Zepro (2015) were; linseed, honey, milk times, fatty meat, eggs, fruits and vegetables. Similarly, Oni and Tukur (2012) found that pregnant women were found to cope with food taboos by either secretly ignoring them or by eating nutritious foods that supposedly prevented the consequences of eating tabooed foods.

As evident in Table 2, it is revealed that the foods most commonly avoided in pregnancy by the pregnant women in this study were snail, mushrooms and pork. Cobbinah, Vink and Onwuka (2008) found that snails are avoided by many pregnant women because it is believed that they make babies sluggish and salivate excessively like a snail. According to the findings of Arzoaquoi (2014), snails are among the list of foods prohibited during pregnancy in the Yilo Krobo District in Ghana. In the same vein, Ihara (2004) found out that many cultures in Africa and South American settings portray eating snail meat as taboo and believe that it makes an individual sluggish or slow and link this to the slimy nature of the snail‘s secretions. However, the findings of Cobbinah, Vink, Onwuka (2008) suggested that there has not been any established

link between snail consumption and sluggishness and pork consumption with prolonged labour. On the contrary, according Fagbuaro, Oso and Edward (2006) found out that the giant African snail has been shown to be a rich source of protein, trace elements and minerals which are needed for proper growth and development in human beings.

Ali and Azim (2016) also found out that ripe plantains and eggs to be the foods often associated with several taboos and prohibited for pregnant women and children. It is therefore not surprising that in this study, the egg was found to be one of the most commonly denied foods of pregnant women, as indicated by 61.0% of the respondents. This is consistent with the finding of Maduforo (2010) who conducted as study on the superstitions and nutrition among pregnant women in Nwangele local government area of Imo state, Nigeria, and found out that most of the pregnant women within the Nwangele districts to not eat because they believe eggs it leads to allergies and malformation of the baby/foetus, and also make babies to steal. This practice has been reported by other studies (Fagbuaro, Oso & Edward, 2006).

5.2.1 The reasons why pregnant women avoid eating some prohibited foods

The reasons given by the women are almost the same as the finding of Maduforo, Nwosu, Ndiokwelu, and Obiakor-Okeke (2013) on food superstition, feeding practices and nutritional anthropometry of pregnant women attending ante-natal clinic in University of Nigeria teaching hospital Ituku/Ozalla, Enugu State, Nigeria. They found out that most pregnant women stopped eating prohibited foods for the fear of miscarriage, depression, and prevention of malformation of foetus. Oni and Tukur (2012) also found out in their study in Uganda that women avoid eating foods like snails, tortoise, ducks and eggs during pregnancies for the avoidance of serious health

problems, miscarriage, premature delivery, stillbirth, or even death of the mother. Furthermore, Yetunde and Olubukunola (2015) found out that a significant number of pregnant women in the West African Region avoid eating some foods during pregnancy for the reasons of religious belief and ancestral taboos. The findings from current study also concurs with the finding of Ekwochi, Osuorah, Ikenna, Ifediora, Asinobi and Eke (2015) that many women from the South-south part of Nigeria are prohibited from eating mudfish, *omoebe* (black soup), *Bini owo* soup, crabs, *omi ukpoka* (corn soup), octopus, snakes/pythons, pigs, antelopes and okro soup to avoid giving birth to unwholesome spiritual babies, sluggish babies with drooling mouth, stillbirth or severe neurological illnesses, including mental retardation, blindness and epilepsy or children with disabilities/malformation.

5.2.2 Self-restricted/avoided foods during pregnancy

This study found out that most of the foods such as snails, mushrooms, pork, eggs and mudfish were classified as sources of cheap protein foods by Okunaiya, Fadupin, and Oladeji, (2016), in their study –Knowledge, attitude and practice of maternal and child food-based dietary guidelines among pregnant women in urban slum of Lagos State". However, this can be deduced that the adherence to food taboos by the pregnant, as found in this study, is preventing the pregnant women from getting the rich nutrients of these foods. More so, most of the foods the pregnant women avoid have a lot of nutritional benefits, including vitamin A from pawpaw (Russell, 2000). Okro and pineapples will also supply vitamins and mineral salts (Slavin, 2013), but these were all avoided.

It is clear from the literature that many many researchers have conducted studies into food taboos, restriction or prohibition during pregnancy and found different results. For example, the findings of Ali and Azim (2016) shows that some pregnant women naturally avoid some foods during pregnancy without being coerced or any attachment to any religious, traditional belief, medical or ancestral taboo. According to them, the sudden urge to stop eating some particular foods during pregnancy may include loss of appetite for sweet delicacies, spicy, salty or sour foods.

5.2.3 Reasons for self-restricted/avoided foods during pregnancy

Just like the tabooed foods, other studies have also found some claims being made by pregnant women concerning certain foods and so they avoid them during pregnancy. Studies in Ghana by Meyer-Rochow (2009) and Nti, Larweh and Gyemfua-Yeboah (2002) revealed that pregnant women in some communities of Ghana avoided *fufu, gari, kokonte* (all cassava-based foods), fresh fish, corn dough porridge, eggs, banana, crabs and ripe plantain, not because of taboos or superstitions. They just did not feel like eating them. Several claims and wild beliefs have been made, most of which have not been proven scientifically. Resnikoff, Pascolini, Kocur, Pararajasegaram, Pokharel, and Mariotti (2004) found out that coconut is one of the leading causes of many eye infections diseases like glaucoma, trachoma believed and baby blind; a condition described as "white eye". Yetunde and Olubukunola (2015) found honey and bambara beans to be regarded as the cause of respiratory and skin problems for the child at birth. Again, Cobbinah, Vink and Onwuka (2008) found corn flour to be linked to heavy bleeding at delivery. More so, Maduforo *et al*, (2013) found that eggs, fresh meat, fresh milk, and sugary foods are also believed to make the unborn babies large or fatty, resulting in difficult delivery, complications and possible death of the mother.

5.2.4 Sources of knowledge and awareness of food taboos

Furthermore, it was found in this study that the highest source of knowledge and awareness of food taboos was from the mosque/church. This response as seen in Table 6 show that the highest source of knowledge and awareness was from the mosque is not surprising since it could be as a result of the settings of the study. Kasoa-Zongo is predominately a Muslim community and with most of the respondents (54.0%) being Muslims as shown in Table 1. The data in Table 3 also indicate that 83.0% of the respondents gave religion as a reason for not eating the tabooed foods. Pork, for example is avoided by Muslims. This finding confirms the findings of Swimberghe, Sharma and Flurry (2011) that religion has consequence on the decision latitude of an individual.

Most of the respondents ranging from 52.0% to 83.0% of the pregnant women were aware of taboos foods during pregnancy. Most of them avoided or stopped eating the forbidden foods to avoid miscarriage, birth defects or malformation, allergies heartburn, lower abdominal pains, depression, and avoidance of characteristics of animal. The qualitative interview data from the responses of the health personnel, birth attendants and herbalist yielded similar responses. However, according to the finding of Biza-Zepro (2015) most of the forbidden foods are rather critical for cellular growth and development of the foetus and pregnant mother during gestation or pregnancy. It was also found out that the pregnant women mostly had information on pregnancy related food taboos from their grand-parents (24.0%), herbalists (21.0%) and parents (17.0%). This suggests that most of them patronized traditional or herbal medicine and/or visited traditional or herbal medicine practitioners for treatment; hence their knowledge of food taboos. It is also likely that either they lived with their grand-parents and parents or vice versa; hence their awareness of the food

taboos. This observation suggests that the pregnant women were taught about food taboos by their immediate and extended families. This finding supports Dove (2010) who found out from an empirical study that in addition to herbal remedies, pregnant women were taught about taboos by their immediate families, extended families, and communities. Similar study carried out in the Yilo Krobo District by Arzoaqoi in 2014 identified rats, snails, snake, hot food and animal lung as prohibited foods during pregnancy. Amoako-Kwakye (2010) also cited in her text that pregnant and lactating women in various parts of the world are forced to abstain from especially nutritious and beneficial foods for social, cultural, and religious reasons. This finding also supports Adigbo and Maddah (2011) who referred to a well-known religious practice that Hindus and those who are forbidden from eating beef and its products comply because cows occupy a sacred place in their religion.

5.3 Research Question Two:

To what extent do the pregnant women in the community adhere to the food taboos?

This question sought to investigate the extent to which pregnant women adhere to food taboos. This study found that the pregnant women sometimes doubt the consequences of the food taboos. This was depicted by the highest mean of 3.09 and affirmed by 74.0% of the respondents. This finding seems to support the findings of Demissie *et al.,* (1998) who asserted that the dissemination of knowledge through antenatal centres, the activities of some religious organisations, maternal experience and some other socioeconomic factors have necessarily increased nutritional knowledge among pregnant women and made them disbelieve the consequences of some traditional food taboos. Also, a large number (76.0%) of the pregnant women answered in the affirmative that they sometimes craved for the foods that they were

tabooed/prohibited/restricted from eating. This attracted the second highest mean score of 3.0 and a standard deviation score of 0.722. Observations from Table 8 also indicate that 59.0% of the respondent found it very difficult to abide/follow food taboos /prohibited /restricted foods, while 52.0% of the pregnant women had unintentionally eaten some of tabooed/prohibited/ restricted foods. The occurrence of food cravings and aversions are very common during pregnancy (Bayley, Dye, Jones, DeBono, & Hill, 2002). Pregnancy sometimes comes with the desire to consume non-food items that usually bad health implication for both mother and foetus (*Weigel et al*., 2011).

Furthermore, Aikins (2014) argued that the existence of food beliefs and taboos were needed to develop an elaborate body of knowledge concerning diverse cultural dietary practices during pregnancy. He added that these taboos, prohibitions or restrictions can have a powerful impact on the outcome of malnutrition relief efforts or prevention campaigns and interventions. The finding in this study is also in line with the findings of Anderson, Campbell, and Shepherd (1993); Brown, *et al*., (1991). They all found out that pregnant women complained about changes in their appetite and they usually developed strong cravings for food that are usually dirty, largely not good for pregnancy and prohibited by health professionals.

Again, in this study, 61.0% of the respondents agreed that food taboos /restrictions/ prohibitions are important to any pregnant woman and so there is no wonder that the statement with the least mean score in Table 8 is ―I feel normal about the food prohibition as a pregnant woman". Fifty-seven percent 0f the pregnant women disagreed to feel normal about the food prohibition. This could be a factor of food cravings that are mostly associated with pregnancy.

As a way of further probing into if the adherence by the respondents was just for a while, the women were asked to indicate whether the compliance with the food restrictions had turned to be permanent or they lasted just for a while. The majority (56.0%) of the pregnant women complied with the food taboos permanently, whereas 44.0% of them did so temporarily during the period of pregnancy only.

Also, the assertions from the midwives and herbalists, who were interviewed in the cause of this study, support the findings from Table 8 of this study, which suggests that adherence to food taboos are important to any pregnant women as affirmed by 64.0% of the respondents, especially the benefits which they got from adherence to the taboos as claimed by 54.0% of them. However, only 37.0% of the pregnant women felt good about compliance to the food taboos. That notwithstanding, 58.0% of the pregnant women complied with the food taboos permanently because it existed among them, and they were compelled to comply with it. Similar sentiments were expressed by the midwives and herbalists during the interview sessions. This observation is in consonance with the views expressed by Arzoaquoi (2014) who indicated that some socio-cultural beliefs regarding food restrictions do exist in Ghana and that the condition for non-adherence is just absent in some communities. It should be noted that compliance to food taboos by the pregnant women would likely affect their food choices, and this could have negative implications on the health of the foetus and the expectant mother as observed by Caulfield (2005).

5.4 Research Question Three:

What is the level of knowledge on nutrition of the pregnant women in the community?

This study further assessed the level of knowledge on nutrition among the pregnant women. It was revealed that 20.0% of the participants demonstrated to have high level knowledge of nutrition issues, 38.0% demonstrated fair or moderate level of nutritional knowledge, while 42.0% demonstrated low level of nutritional knowledge. Thus, it can be said that nutritional knowledge was moderate among the participants (since 58.0% of the respondents either have high or fair level of knowledge). More so, the fact that the greater majority (78.0%) of the pregnant women said the statement ‗Pregnant women should not eat non-food items such as clay' was significant in the sense that many pregnant women crave for clay, which often keeps health personnel wondering. They are advised against it but most often in vain. These shows the women are aware of the dangers it can bring. It was also good for them to respond that ‗Personal hygiene is important in pregnancy in order to prevent infections/diseases and that at least six hours of sleep is adequate for pregnant women. Some of the herbal teas are taken by pregnant women without any directives by any Health personnel. Some of them are local teas without any dosages and they are often said to be dangerous to both maternal and child health. If they are aware and will observe the advice then it will be good for them. Excess salt intake must be resisted by pregnant and dairy foods provide calcium for pregnant women so it will be good for the MCH to stress on these during anti-natal visits. On the whole, the means for all the statements are less than 1, indicating that the means are all closely dispersed.

On the whole, most of the pregnant women in this study can be described as having adequate knowledge about issues regarding pregnancy, health and nutrition. The result of this study falls in line with the findings of the study conducted by Zahara, Nuruljannah, Yee, Sim, and Chua (2014) in America in which more than half of the women in the study had the basic and essential knowledge regarding importance of nutrition during pregnancy. Similar results were found in Swaziland by Latifa, Manal and Nihal (2012) and in Malaysia by Sakhile and Shu (2014) where 65.7% and 67.0% of mothers respectively had appropriate knowledge towards maternal nutrition. This finding is also in line with the results of a study carried out in Ethiopia by Daba, Beyene, Fekadu, Garoma (2013). They found that out 67.4% of the respondents had the knowledge that food during pregnancy is important for bodies‘ energy and heat. However, in a study in Egypt, Gambia (1995) found out that only 46.0% of mothers had appropriate knowledge regarding maternal nutrition. He attributed that the discrepancy might be related to socioeconomic and cultural difference of the study participants.

5.4.1 Sources of nutritional knowledge for pregnant women

It emerged from this study that majority (52.0%) of the pregnant women had information and knowledge of food and nutrition from the hospitals as they attended antenatal clinics. The first and most important source of information on nutrition for the respondents in this study is from the hospital given by 52.0% of the respondents, followed by 27.0% who had the knowledge either from church or mosque. The surprising aspect of this revelation is that none of them mentioned the school, teachers or books, although 62.0%, made up of 38.0% with second cycle and 24.0% with tertiary level of education, meaning the pregnant women in this study had a relatively high level of education, as shown in Table 1, however, none of them had the

knowledge from school, or teachers or books. The media (TV and Radio), traditional birth attendants and herbal practitioners formed the other sources.

Also, this affirms the views of Graves (2011) who observed that majority of pregnant women already had a fair knowledge on the appropriate diet they needed to eat in order to stay healthy and those who visited ante-natal clinics were also given more advice on healthy food choices. This finding, however, contradicts Fowles's (2002) claim that most pregnant women had inadequate general nutritional knowledge, and their dietary intake did not meet all the nutritional requirements of pregnancy.

Also, the qualitative data, being interview responses, were somehow similar to those from the pregnant women themselves. The findings from the study affirm the views of Graves (2011), who observed that the majority of pregnant women already had a fair knowledge on the appropriate diet they needed to eat in order to stay healthy. The knowledge reported was from their visits to ante-natal clinics since they were also given more advice on healthy food choices during such visits. The finding, however, contradicts Fowles's (2002) claim that most pregnant women in the USA had inadequate general nutritional knowledge, and their dietary intake did not meet all the nutritional requirements of pregnancy.

5.5 Research Question Four

What are the alternative foods the pregnant women consume to replace the tabooed foods?

This question sought to explore the alternative foods the pregnant women consume to replace the tabooed foods. This study found that Herrings (72.0%), Salmon (65.0%), Agushie (60.0%) and Chicken (59.0%) were most alternative foods eaten by the pregnant women. Cocoyam leaves (Kontomire stew) and palava sauce had 55.0%,

Farmer cheese (*waa-ga-shee*) 42.0% and millet 39.0%. This finding is concurrent with the many other research findings. The American Dietetic Association (ADA, 2002) found out that many women in the USA crave for mackerels, sardines, herring and pilchards during pregnancy. According them, smoked fish, such as kippers, smoked mackerel and herrings are the most craved food by many pregnant women in the UK. This discrepancy could be a result of the cultural and demographic differences.

In addition to the list of findings, the results of the analysis in Table 12 further reveal that the intake of salmon was relatively high among the pregnant women in this study. The level of salmon consumption by pregnant women, 65.0% in this sample, good because is within the recommendation by the American Pregnancy Association (2015). The recommendation is based on the fact that salmon is a rich source of omega-3 fatty acids, which promote neurological and visual development for the baby and could lower the risk of pre-term delivery and pre-eclampsia. The American Pregnancy Association (2015) additionally reported that salmon is a healthy source of protein and B vitamins which is good for the development of the foetus. However, there is a caution that salmon is seafood and it is as considered a potential risk to pregnancy due to high mercury content. According to the Association, pregnant women should not have more than 12 ounces of seafood per week, and just like any other food taken during pregnancy, it is important that salmons are taken in the correct proportion.

Cocoyam leaves *(Kontomire)* stew/ palava sauce was also found to be one of the alternative foods consumed by the pregnant women. This is in agreement with the findings of Bediako, (2012) that *Kontomire* stew/ Palava is eaten by many pregnant

women in Africa because it has delicious taste, and contains some essential nutrients like protein, Vitamin C, Iron, Calcium and Vitamin A, all of which are associated with foetal good growth and maturation.

5.5.1 Reasons why the pregnant women consumed the alternative foods

Furthermore, this study found that four reasons why the pregnant women ate the alternative foods were as follows: i). ―Because they were certain that the replaced foods contain equal amounts of nutrients as the tabooed foods". This assertion could be true but since no tests were carried out, it tends to portray the fact that the women were aware of the composition of the two types of foods. This was the statement that had the highest mean of 3.04, much higher than 2.5. However, 26.0% of them held divergent views. They did not agree that the alternate foods had higher nutrient content. The second highest mean is 3.00 meaning there was a high agreement with the fact that the replaced foods are readily available in the community. This is a good reason because the pregnant women could easily get them when needed. Some of them may even be having some in their backyard or farms. Also they agreed with the statement that they felt comfortable eating the replaced foods instead of the tabooed foods. Obviously, since they were readily available in their communities, they were familiar with them, although 25.0% of them refuted this claim. As shown in Table 13, 76.0% pregnant women agreed that the alternative foods were relatively affordable while 24.0% of them disagreed. If the foods mentioned as alternatives are affordable then it is welcome news since a number of them can access them.

The results in Table 12 and 13, and the qualitative data reveal that most of the pregnant women ate *agushie*, salmon, herring, famer cheese (*wagashie*), chicken, mutton, and beef in place of the taboo foods. It is evident from the results in Table 14

that between 74.0% and 79.0% of the pregnant women ate alternative foods because of their availability, relative affordability, comfort or convenience of eating them, and their nutrient composition or nutritional value. This implies that the pregnant women considered it necessary to eat a variety of alternative foods to maintain optimal nutrition. This observation supports the finding of the American Dietetic Association (2002) which established that for a pregnant woman, maintaining optimal nutrition through healthful food choices such as fruits, vegetables, dairy products, whole grains and lean protein is ideal. This further supports the claim by American College of Obstetricians and Gynaecologists (ACOG, 2011) that pregnant women should have a diet that consists of variety foods including proteins, carbohydrates, vitamins, minerals and fats.

5.6 Testing of Hypotheses

Null Hypothesis 1: There will be no significant relationship between the educational level of the pregnant women and their adherence to food taboos.

This study found a Pearson Correlation analysis score of (-0.643) between the level of education of the pregnant women and their level of adherence to food taboos. This negative relationship between the two variables is an indication that adherence to food taboos is largely dependent on the level of education of pregnant women. This result further suggests that adherence to food taboos seems to be more prevalent among pregnant women with low levels of education as compared to their counterparts with high educational status. This finding is consistent with the findings of Caulfield (2005) and Chen *et al*. (2007) who stated that women with some level of education are more likely to adhere to nutritional advice. Caulfield (2005) stressed further that a low level of education is a risk factor that affects the nutritional practices of people, including pregnant women

Null Hypothesis 2: There will be no significant relationship between religion of the pregnant women and adherence to food taboos.

The second hypothesis was to test the relationship between the religious belief of the pregnant women and their adherence to food taboos. The idea is to establish whether the religious background of the pregnant women have any specific effect on their adherence to food taboos. Table 15 showed a Pearson Correlation result of (0.516) at a Sig. of (0.361). This implies that there is a significant positive but moderate interactive relation between religious belief of the pregnant women and their adherence to food taboos; therefore, this hypothesis was also rejected. This finding confirms the view Adigbo and Maddah (2011), who cited that Hindus in India are forbidden from eating beef and its products because cows occupy a sacred place in their religion.

Null Hypothesis 3: There is no significant relationship between the educational level of the pregnant women and their level of knowledge on nutrition.

More so, this study tested and a significant positive interactive relationship between level of knowledge of the pregnant woman and their level of nutritional knowledge (Pearson Correlation value of 0.503 at a Significance Level of 0.05). This means that the educational level of the pregnant women have a significantly positive effect on their level of nutritional knowledge. Thus, this implies that pregnant women with higher educational level are likely to have high nutritional knowledge, whereas those with lower level of education background are likely to have a lower level of nutritional knowledge. This finding agrees with the findings in China by Zhang *et al*. (2009) and Liu *et al*. (2007). Both studies reported a significant relationship between the educational level and the nutritional knowledge of pregnant women. Another study by Wachs and Mccabe (2001) reported that pregnant women with higher

education level are better exposed to nutrition knowledge and education and were better predictor of toddler dietary intake, as they understand more about nutrition and able to provide a more nutritionally adequate diet for their child. A similar study by Burchi (2010) in Mozambique reported that good education was associated with higher nutritional knowledge of expectant mothers and improved their understanding of information disseminated by various media and ANC centres. In all, this current study confirms that the level of education determines the nutritional knowledge of the pregnant women.

Null Hypothesis 4: There will be no significant relationship between the ages of the pregnant women and adherence to food taboos.

The hypothesis number four was to test of the relationship between the ages of the pregnant woman as against their level of adherence to food taboos. This hypothesis was also rejected as the analysis from the Pearson Correlation result showed (r=0.133) at a Sig. of (p = 0.005).

Null Hypothesis 5: There will be no significant relationship between the stages of pregnancy of the pregnant women and adherence to food taboos.

Finally, the analysis of results from this study established a positive but weak interactive relation between the stages of pregnancy and adherence to food taboos. This was connoted by the Pearson Correlation of (r = 0.293) at a Sig. of (p = 0.001). This implied that the pregnant women in their third trimester had the highest adherence to food taboos compared to their counterpart in first and second trimesters.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter gives a summary of the study, draws conclusions from the study and also makes recommendations as to how to address the critical issues that emerged from the study

6.2 Summary of the Study

The purpose of this study was to investigate the prevalence and adherence to food taboos associated with pregnancy in the Kasoa-Zongo community.

The research objectives for the study were

1. Identify food taboos and beliefs associated with pregnancy in Kasoa-Zongo community.
2. Investigate the level of adherence to food taboos by pregnant women in the community.
3. examine the nutrition knowledge of pregnant women in the community.
4. Examine the alternative foods the pregnant women consume to replace the tabooed foods.

The following hypotheses were formulated to guide the study:

Ho_1: There is no significant relationship between the educational level of the pregnant women and compliance to food taboos.

Ho_2: There is no significant relationship between the religion of the pregnant women and adherence to food taboos.

Ho_3: There is no significant relationship between the educational level of the pregnant women and their level of knowledge on nutrition.

Ho_4: There will be no significant relationship between the ages of the pregnant women and adherence to food taboos.

Ho_5: There will be no significant relationship between the stages of pregnancy of the pregnant women and adherence to food taboos.

More so, this study adopted the mixed-methods sequential explanatory design. A combination of purposive, snowball, and convenience sampling methods was adopted in selecting a total of 106 (11%) participants for the study (The 106 participants were made up of 100 pregnant women who reported and registered for antenatal care services at the Kasoa Polyclinic between January 2016 and June, 2017; three (3) health attendants and three (3) traditional health attendances). Structured questionnaire was used to collect data for this study. The structured questionnaire was divided into four sections, that is _A, B, C and D‘. Section _A‘ sought information on biographical data. The rest of the items were in three major categories, namely on pregnancy-related food taboos, the rate and reasons for adherence, and assessment of nutritional knowledge of the pregnant women in Kasoa Zongo community. In case of the closed-ended items, the structured questionnaire for this survey contained a five-point close-ended Likert-type items: Strongly Agree (SA) = 4), Agree (A) = 3), Disagree (D) = 2 and Strongly Disagree (SD) = 1.

Finally, the data collected and analyzed descriptively using Statistical Product for Service Solutions (SPSS version 20.0) and was presented in tables as frequencies, percentages, means, standard deviation and Pearson correlation analysis.

6.3 Summary of Key findings

The findings of the study are presented based on the Research Questions:

A. Demographic Characteristics of the Respondents

a. Out of the 100 respondents, only 2 (2.0%) were less than 20 years old, 45 (45.0%) were aged between 20 and 39 years, 48 (48.0%) were between the age of 30 and 39 years, while the remaining 5 (5.0%) were over 40 years old; and 84 (84.0%) were married, whereas 16 (16.0%) were single.

b. Also, majority (59.0%) of the respondents were trading/business women, 28.0% were Civil servants (teacher, nurse, banker etc), 7.0% were artisans (hairdressers, seamstress etc), 5.0% were housewives and only 1.0% was a student. Meanwhile, 29.0% of the respondents had Basic school level of education, 38.0% had Secondary level of education, 24.0% had Tertiary level and the remaining 9.0 had no formal education.

c. Furthermore, Out of the 100 respondents, majority of them (54.0%) were Muslims, Christians were 38.0%, whereas only 8.0% were Traditionalist.

d. With regards to Nationality, majority (75.0%) of the respondents were Ghanaians, whereas, only 25.0% were Non-Ghanaians

e. Finally, on the stages of pregnancy, 30.0% of the respondents were in their first trimester, 36.0% were in their second trimester and the rest of 34.0% were in their third trimester.

B. Respondents' view on the Food Taboos and Beliefs Associated with Pregnancy in Kasoa-Zongo Community

a. This study found snails (84.0%), ripe plantain (79.0%), mushrooms (73.0%) and pork (68.0%) to be the most common tabooed food amongst the pregnant women at Kasoa, However, duck (21%) and goat (16.0%) were found to be the least tabooed foods amongst them

b. The majority of the respondents avoided eating the forbidden foods for adherence to Religious belief 83 (17.0%), for the fear of miscarriage 79 (16.2%), for the prevention of Foods spiritually unwholesome babies 66 (13.5%), Taboo (ancestral taboo) 63 (12.9%), Baby born with watery/slimy mouth 59 (12.1%), for the Prevention against prolonged labour 58 (11.9), allergies and malformation 46 (9.4%) and depression 34 (7.0%).

c. It was also found out that some of the respondents had self-restricted themselves from eating certain foods. Such foods included; sugarcane (15.3%), coconut (14.9%), pawpaw (13.8%), pineapple (13.3%), okro (12.2%), palm kernel oil (8.7%), sugary foods (7.7%) and beans (6.5%).

d. The reasons for the personal restrictions were; Miscarriage (30.0%), heartburns and lower abdominal pain (23.0%), constipation (12.0%), fatty babies that result in difficult delivery (11.0%), allergies such as itching throat (10.0%), malformation/foetal abnormality (10.0%) and lastly skin and respiratory problems (4.0%)

e. Most of the pregnant women had information on pregnancy related food taboos from mostly the Mosque/church (31.0%), grandparents (24.0), herbalists (21.0%) and parents (17.0%), personal knowledge and/or self-awareness (7.0%).

f. Also it was established that religion (45.0%), health (42.0%) and security (13.0%) were the reasons/motives why the pregnant women did not eat taboo taboos.

C. The Extent to which Pregnant Women in the Community Adhere to the Food Taboos

a. This study found that food taboos were generally adhered among the pregnant women.

b. It was found that 74.0% of them sometimes doubt the consequences of the taboos, Food taboos/ restrictions/ prohibition were important to any pregnant woman (64.0%), 58.0% strictly obey food taboos as a pregnant woman strictly, meanwhile, some still finds it very difficult to abide/follow food taboos /prohibited /restricted foods (59.0%) and only 37.0% feel normal about the food prohibition as a pregnant woman

D. The Respondents' Level of Knowledge on Nutrition

a. Additionally, 20.0% of the respondent had good nutritional knowledge, 38.0% had fair nutritional knowledge and the remaining 42.0% of the respondents were found to have low nutritional knowledge

E. The Alternative Foods the Pregnant Women Consume to Replace the Tabooed Foods

Most (52% to 75%) of the pregnant women ate a variety of alternative foods such *agushie* (75.0%), herring (72.0%), salmon (65.0%), egg yolk, and fruits in place of the taboo foods, because of their availability, relative affordability, convenience of eating them, and their nutritional value.

F. Testing of Hypotheses

a. More so, this study found a significant relationship between the level of education of pregnant women and adherence to food taboos (r= -0.643, p =.0.091). Adherence to food taboos is relatively more prevalent and high among pregnant women with low level of education compared to their counterparts with higher educational status.

a. There was significant relationship between the religious or spiritual status of pregnant women and adherence to food taboos (r= .516, p= .361). Adherence to food taboos is relatively more prevalent and high among pregnant women who have strong or higher religious inclination compared to their counterparts with no or low religious inclination.

b. Additionally, there was a significant relationship between the educational level of the pregnant women and their level of knowledge on nutrition. This was depicted by a Pearson Correlation value of 0.503 at a Significance Level of 0.05. This implies that pregnant women with higher educational level are likely to have high nutritional knowledge, whereas those with lower level of education background are likely to have a lower level of nutritional knowledge.

c. There was a significant relationship between the ages of the pregnant women and adherence to food taboos. The result in Table 17 showed Pearson Correlation of (r=0.133) at a Sig. of (p = 0.005). This signifies that the ages of the pregnant women had a positive but very weak impact on their level of adherence to food taboos.

d. Finally, was a significant relationship between the stages of pregnancy of the pregnant women and adherence to food taboos. Pearson Correlation analysis in Table 18 showed (r = 0.293) at a Sig. of (p = 0.001). This implies that pregnant

women within their 3rd trimester (13-28 weeks of pregnancy) are likely to adhere more to food taboos than those within their first trimester (0-12 weeks of pregnancy).

6.4 Conclusions

a. An average respondent from this study is a pregnant woman between the ages of 20 to 30 years, a trader/business woman, with secondary level of education, married, a Muslim, Ghanaian, and in her second trimester of pregnancy.

b. Overall, the foods that were avoided or tabooed included snails, ripe plantain, mushrooms, pork, duck and goat. For the reason of religious belief, fear of miscarriage, prevention of foods spiritually unwholesome babies, taboo (ancestral taboo), baby born with watery/slimy mouth, prevention against prolonged labour, allergies and malformation and depression.

c. Again, certain foods that were self-restricted by the pregnant women themselves included; sugarcane, coconut, pawpaw, pineapple, okro, palm kernel oil, sugary foods and beans to prevent miscarriage, heartburns and lower abdominal pain, constipation, fatty babies that result in difficult delivery, allergies such as itching throat, malformation/foetal abnormality and lastly skin and respiratory problems

d. It was also eminent that the information on pregnancy related food taboos were sourced from the Mosque/church, their grandparents, herbalists and parents.

e. That notwithstanding, some pregnant women in kasoa Zongo eat a variety of alternative foods such agushie, herring, salmon, egg yolk, and fruits in place of the taboo foods, because of their availability, relative affordability, convenience of eating them, and their nutritional value.

f. The results of the five hypotheses yielded statistical significant relationships between the Level of education, the religious or spiritual status of pregnant women, the ages of the pregnant women, the stages of pregnancy of the pregnant women and adherence to food taboos. Also, statistical significant relationships were found between the educational level of the pregnant women and their level of knowledge on nutrition.

It can be concluded from these results of the hypotheses that in this study:

1. Adherence to food taboos was relatively more prevalent and high among pregnant women with low level of education compared to their counterparts with higher educational status;
2. Adherence to food taboos also was relatively more prevalent and high among pregnant women with strong or higher religious inclination compared to their counterparts with no or low religious inclination;
3. The ages of the pregnant women had a positive but very weak impact on their level of adherence to food taboos;
4. The pregnant women within their 3rd trimester (13-28 weeks of pregnancy) are likely to adhere more to food taboos than those within their first trimester (0-12 weeks of pregnancy); and
5. The pregnant women with higher educational levels had higher nutritional knowledge, whereas those with lower level of level of education background had a lower level of nutritional knowledge.

6.5 Recommendations

In the light of the findings of this study, the following recommendations are put forward.

To reduce maternal and neonatal morbidity and mortality and promote safe and healthy delivery of a live and healthy baby, conscious efforts must be made by all stakeholders to achieve this. The following recommendations have been suggested:

a. Nurses and midwives in the Awutu-Senya East (Kasoa) Municipality, faith-based organizations (FBOs), the media, and other stakeholders should educate expectant mothers to eat alternative healthy and nutritious foods, including iron-rich foods in lieu of taboo foods. They should encourage them to eat alternative nutritious foods which contain protein, vitamins and minerals such as fruits examples are, banana, oranges, pineapples and monkey apples (*alasa*) and vegetables with examples as, kontomire stew and soup, *ayoyo* soup, *agushie* and garden egg stew.

b. Though education on healthy eating is already on going in various Maternal and Child Health clinics in the municipality, it should be well intensified and expectant mothers should be assisted on how to plan a well-balanced diet, including alternative foods in lieu of taboo foods using the local food ingredients available to them.

c. Health workers and health authorities in the municipality should implement surveillance activities to increase coverage and compliance of iron supplementation.

6.6 Suggestions for Further Research

The study should be replicated by other researchers in order to strengthen the foundation for interpreting results. A replication of the study with samples drawn

from all the public and private health care facilities (hospitals, clinics, CHIPS compounds, traditional birth attendants) in the municipality would provide additional insights into issues pertaining to the food taboos and nutritional practices of pregnant women.

Researchers investigating the food taboos and feeding practices of pregnant women should also conduct such studies among expectant mothers who do not attend any antenatal clinics. This would limit the level of bias that the research environment could have on the data being generated.

A comparative study can be undertaken on food taboos and nutritional practices of rural and urban women of reproductive age. A study can be conducted to assess the knowledge and adherence to food taboos.

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APPENDIX A

Structured Questionnaire for Pregnant Women

Dear Madam,

I am an M.Phil. student of University of Education, Winneba. As part of my programme, I am conducting a study on the prevalence of pregnancy related food taboos among pregnant women. The purpose of this study is to investigate the prevalence and adherence to food taboos associated with pregnancy in the Kasoa-Zongo community. This is for academic purpose only and I will appreciate it if your candid opinions are provided. You are assured of anonymity because none of the information provided will be connected to you. I am most grateful for your anticipated participation.

Thank You.

AMIDATU YAKUBU

Please tick [ ] the responses that best correspond to your opinion or write your response in the space provided

SECTION A: Demographic Characteristics

1. Age
   Less than 20 years [ ] 20 – 29 years [ ]
   30 – 39 years [ ] over 40 years [ ]

2. Marital status

   Married [ ] Single (never married, divorced widowed) [ ]

3. Occupation, please specify…….
   Wage-employees (Civil servants, teachers, nurses, bankers) [ ]
   Traders [ ] Hairdresser, seamstresses [ ] Housewife [ ]
   Student [ ]

4. Highest level of education
   Basic [ ] Secondary [ ] Tertiary Non [ ]

5. Religion ;
   Muslim [ ] Christian [ ] Traditionalist [ ]
   Ethnic group, please specify…….

6. Nationality;
   Ghanaian [ ] Non- Ghanaian [ ]

7. Stage of pregnancy; 1st trimester [ ] 2nd trimester [ ] 3rd trimester [ ]

SECTION B: Food Taboos Associated with Pregnancy

8. Choose any food relating to pregnancy taboo from the list below by ticking

Food	Tick here
Duck	
Eggs	
Fishes (mudfish)	
Goat	
Groundnut	
Mushrooms	
Pork	
Python	
Ripe plantain	
Snails	
Tortoise	

9. Kindly complete the table below by listing the reasons why you avoid eating some prohibited foods

NB: You are allow to list three reasons at most

Reason	**Tick here**
Allergies and malformation	
Baby born with watery/slimy mouth	
Depression	
Foods spiritually unwholesome	
Prevention against prolonged labour	
Prevention of miscarriage	
Religious belief	
Taboo (ancestral taboo)	

10. What are the foods you have stopped eating as a result of your pregnancy and give reasons for the prohibitions?

.....

.....

10. Complete the table below by listing the reasons why you avoid eating some of the foods you listed in question 11

Reason	Tick here
Allergies (itching throat)	
Constipation	
Fatty baby and difficult delivery	
Heartburn, lower abdominal pain	
Malformation/Foetal abnormality	
Miscarriage	
Skin and respiratory problems	

11. Where did you get the idea of the food taboos from?

[ ] Parent
[ ] Grandparents
[ ] Church / Mosque
[ ] Herbalist
Others (Specify)……..

12. Generally what are the reasons for all the prohibitions?

[ ] Health
[ ] religion
[ ] security

Other (please specify) …….

SECTION C: Level of Adherence to Food Taboos

13. Complete the table below by ticking strongly disagree, disagree, agree or strongly agree by the statements provided.

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
I sometimes doubt the consequences of the taboos				
I often crave for the foods I was tabooed/prohibited/restricted from eating				
Food taboos/ restrictions/ prohibition are important to any pregnant woman				
I obey food taboos as a pregnant woman strictly				
It is very difficult to abide/follow food taboos /prohibited /restricted foods				
I have unintentionally eaten some of the foods I was tabooed /prohibited/ restricted from eating				
There are some benefits I drive from pregnancy related food taboos				
I feel normal about the food prohibition as a pregnant woman				

14. Indicate whether the food is prohibited

[ ] Permanently

[ ] Temporary (i.e. during pregnancy)

SECTION D: Nutritional Knowledge of Pregnant Women

Please complete each of the numbered sections of the information by filling in the blank statement or write in the space provided where necessary to the appropriate items below;

15. A pregnant woman should have some form of exercise in order to.....
16. Adequate weight maintenance in pregnancy is important because.....
17. The importance of folic acid supplement given to pregnant women during pregnancy is to.....
18. Protein-rich foods are very vital for pregnant women, especially during the first two trimesters because.....
19. Intake of animal fat should be reduced during pregnancy in order to prevent.....

Please complete each of the numbered sections of the information by ticking true or false in the space provided where necessary to the appropriate items below;

20. Pregnant women should not eat non-food items such as clay
    True [ ]
    False [ ]

21. Personal hygiene is important in pregnancy in order to prevent infections/diseases
    True [ ]
    False [ ]
22. At least six hours of sleep is adequate for pregnant women
    True [ ]
    False [ ]

23. Herbal teas should be taken with caution since they may be unsafe
    True [ ]
    False [ ]

24. It is unsafe to eat fresh vegetables and fruits that have been sprayed with pesticide, even after they have been washed
    True [ ]
    False [ ]

25. Pregnant women must avoid sweetened foods and beverages throughout the period
    True [ ]
    False [ ]
26. Pregnant women should avoid raw meat, fish, poultry raw eggs and unpasteurized dietary products
    True [ ]
    False [ ]

27. As a rule, all pregnant women must eat three square meals per day
    True [ ]
    False [ ]

28. The mineral elements which strengthen foetal bones include potassium.
    True [ ]
    False [ ]

29. Green leafy vegetables help to prevent anaemia in pregnancy
    True [ ]
    False [ ]

30. Fried, fatty foods cause heartburns during pregnancy
    True [ ]
    False [ ]

31. Any form of exercise during pregnancy is desired
    True [ ]
    False [ ]

32. Pregnant women must resist excess salt intake
    True [ ]
    False [ ]

33. Foods that cause food-borne diseases can always be detected by changes in appearance, smell or taste
    True [ ]
    False [ ]

34. Dairy foods provide calcium for pregnant women.
    True [ ]
    False [ ]
35. What are the source(s) of your nutrition knowledge?
    Hospital/antenatal clinic [ ]
    Church/ Mosque [ ]
    Media (TV, Radio….) [ ]
    Other (specify)……..

SECTION E: Alternative Foods Consumed by the Pregnant Women to Replace the Tabooed Food.

36. What are some of the foods you replaced with the Tabooed foods?

.....

.....

37. Complete the table below by ticking strongly disagree, disagree, agree or strongly agree by the statements provided below.

Statement	Strongly Disagree	Disagree	Agree	Strongly Agree
The replace foods contain equal nutrients as the tabooed ones				
I am comfortable eating the replaced foods instead of the tabooed ones				
The foods are affordable				
The foods are readily available in my community				

Thank You.....

APPENDIX B

Structured questionnaire for Health Personnel (Midwives)

Dear Madam,

I am an M.Phil. Student of University of Education, Winneba. As part of my programme, I am conducting a study on the prevalence of pregnancy related food taboos among pregnant women. The purpose of this study is to investigate the prevalence and adherence to food taboos associated with pregnancy in the Kasoa-Zongo community. This is for academic purpose only and I will appreciate it if your candid opinions are provided. You are assured of anonymity because none of the information provided will be connected to you. I am most grateful for your anticipated participation.

Thank You.

AMIDATU YAKUBU

SECTION A: Food Taboos Associated with Pregnancy

1. Do you have any knowledge on food taboos associated with pregnancy?
2. What is food taboos associated with pregnancy?
3. Can you mention some of the food taboos associated with pregnancy?
4. Can you tell some of the reason why some pregnant women are prohibited from eaten certain food?

SECTION B: Level of Adherence to Food Taboos

5. Do some of the pregnant women adhere to this food taboos?
6. If yes, what could be their reasons for adherence to this food taboos?
7. If no, why the non-adherence

SECTION C: Nutritional Knowledge of Pregnant Women

1. Do the pregnant women have knowledge about nutrition?
2. Do you think their level of nutritional knowledge have bearing on their adherence?
3. Do you organize educational programs for women?
4. What are the topics you discuss the pregnant women?
5. How often do you organize sure programs?
6. Do you see the educational programs as useful to pregnant women?
7. If yes how useful?

SECTION D: Alternative Foods Consumed by the Pregnant Women to Replace the Tabooed Food.

1. Are you able to advise pregnant women to consider eating other foods as a replacement of the tabooed ones?
2. What will be your final comment concerning pregnancy related food taboos?

APPENDIX C

Structured questionnaire for Traditional Heath Attendance

(Herbalist)

SECTION B: Food Taboos Associated with Pregnancy

1. Do you have any knowledge on food taboos associated with pregnancy?
2. What are food taboos associated with pregnancy?
3. Can you mention some of the food taboos associated with pregnancy?
4. Can you tell some of the reason why some pregnant women are prohibited from eaten certain food?
5. If yes what are the reasons?

SECTION C: Level of Adherence to Food Taboos

6. Do some of the pregnant women adhere to this food taboos?
7. If yes, what could be their reasons for adherence to this food taboos?
8. If no, why the non-adherence

SECTION D: Nutritional Knowledge of Pregnant Women

9. Do you consider the nutritional needs of the pregnant women?
10. Do the pregnant women have knowledge about nutrition?

SECTION E: Alternative Foods Consumed by the Pregnant Women to Replace the Tabooed Food

11. Are you able to advise pregnant women to consider eating other foods as a replacement of the tabooed ones?
12. What will be your final comment concerning pregnancy related food taboos?

APPENDIX D

Reasons why the pregnant women consumed the alternative foods (n = 100)

Statement				Response	
		SD	D	A	SA
The replaced foods contain equal amount of nutrients as the tabooed foods					
I am comfortable eating the replaced foods instead of the tabooed ones					
The alternative foods are affordable					
The alternative foods are readily available in the community					
Source: Fieldwork data (2016).					

Key: SD – Strongly Disagree; **D** – Disagree; **A**– Agree; **SA** – Strongly Agree.

APPENDIX E

Marking Scheme

Nutritional Knowledge of Pregnant Women

Please complete each of the numbered sections of the information by filling in the blank statement or write in the space provided where necessary to the appropriate items below;

1. A pregnant woman should have some form of exercise in order to.....

   (Answer: Regular exercise during pregnancy can improve health, reduce the risk of excess weight gain and back pain, and it may make delivery easier)

2. Adequate weight maintenance in pregnancy is important because.....

   (Answer: to prevent complications during childbirth, like macrosomia and the likelihood of undergoing Cesarean section during labour).

3. The importance of folic acid supplement given to pregnant women during pregnancy is to.....

   (Answer: help prevent birth defects known as neural tube defects, such as spina bifida. Folate is a B group vitamin needed for healthy growth and development).

4. Protein-rich foods are very vital for pregnant women, especially during the first two trimesters because.....

   (Answer: Protein positively affects the growth of foetal tissue, including the brain. It also helps the breast and uterine tissue to grow during pregnancy and it plays a role in increasing blood supply for both mother and baby)

5. Intake of animal fat should be reduced during pregnancy in order to prevent.....

   (Answer: health problems, including heart disease.)

Please complete each of the numbered sections of the information by ticking true or false in the space provided where necessary to the appropriate items below;

6. Pregnant women should not eat non-food items such as clay

   True √

   False

7. Personal hygiene is important in pregnancy in order to prevent infections/diseases

   True √

   False

8. At least six hours of sleep is adequate for pregnant women

   True √

   False

9. Herbal teas should be taken with caution since they may be unsafe

   True √

   False

10. It is unsafe to eat fresh vegetables and fruits that have been sprayed with pesticide, even after they have been washed

    True √

    False

11. Pregnant women must avoid sweetened foods and beverages throughout the period

    True √

    False

12. Pregnant women should avoid raw meat, fish, poultry raw eggs and unpasteurized dietary products

    True √

    False

13. As a rule, all pregnant women must eat three square meals per day

    True

    False √

14. The mineral elements which strengthen foetal bones include potassium.

    True √

    False

15. Green leafy vegetables help to prevent anaemia in pregnancy

    True √

    False

16. Fried, fatty foods cause heartburns during pregnancy

    True √

    False

17. Any form of exercise during pregnancy is desired

    True

    False √

18. Pregnant women must resist excess salt intake

    True √

    False

19. Foods that cause food-borne diseases can always be detected by changes in appearance, smell or taste

    True √

    False

20. Dairy foods provide calcium for pregnant women.

    True √

    False