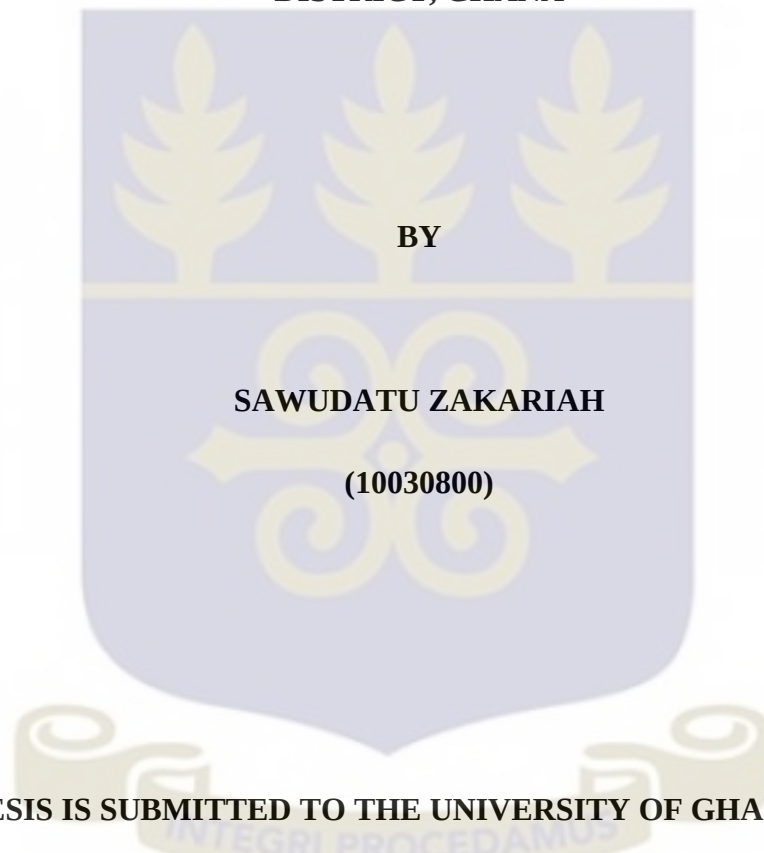


**SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA, LEGON**

**A STUDY OF COMMUNITY PERCEPTIONS AND STRATEGIES TO
IMPROVE WOMEN'S DIETARY QUALITY IN SVELUGU-NANTON
DISTRICT, GHANA**



**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN
PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF
PHD PUBLIC HEALTH DEGREE.**

2018

DECLARATION

I, Sawudatu Zakariah, hereby declare that this thesis was written by me in the School of Public Health of University of Ghana under the supervision of Prof. Richmond Aryeetey, Prof. Augustine Ankomah and Prof. Kwesi Torpey. All references cited in this document have been duly acknowledged.

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DEDICATION

To all women whose life of hard work and sacrifices enable their children and future generations to have a healthier and successful life

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I am equally grateful to all members of the two study communities – Yilkpene and Kpachilo –for their unreserved co-operation during all the phases of the study. For the same reason, the schedule officers responsible for agricultural extension services and nutrition in Savelgu-Nanton District deserve my unqualified gratitude. My fieldworkers and implementation team deserve my sincerest compliments for their creditable performance as my research assistants and local resource persons.

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May the Benevolent, Omnipotent, Omnipresent and Omniscient Father above reward all my benefactors with life-long showers of blessings. Notwithstanding the assistance I got from all the acknowledged sources, all the lapses in the thesis are wholly mine.

ABSTRACT

Background: The diets of women in reproductive age (WRA) are an important determinant of their health outcomes and quality of life especially in northern Ghana, where women's diets remain persistently suboptimal. However, socio-cultural barriers, one of the multiple influences on WRA's diets, are rarely addressed in existing interventions. This study identified the socio-cultural barriers to WRA achieving optimal diets, which, herein, represent beliefs, attitudes and actions that are derived from the existing native and emergent culture of the community and tested the feasibility of a community-based pilot intervention developed in consultation with the community to address these barriers.

Methods: Socio-cultural barriers to women's diets were identified and characterized through a qualitative study involving the exploration of the local food system, dietary knowledge, attitudes and practices at Yilkpene and Kpachilo. Data was collected through key informant interviews, focus group discussions, qualitative 24-hour dietary recalls with in-depth interviews and observations at the household and community levels. A 17-week attitudinal and behaviour change intervention was designed and implemented at Yilkpene in consultation with key community stakeholders. The first component, nutrition education, emphasized the importance of women's diets and their reproductive health. The second component, advocacy, concerned empowering women to have more control over household food resources and modifying food taboos affecting women. Messages were delivered in the local language through participatory activities including community durbars, small group meetings, home-visits and food demonstration sessions. In the post-evaluation of the intervention, data was collected from 182 participants using the same tools used at baseline. The two sets of data were compared to assess the impact of the intervention at Yilkpene.

Results: Study participants, all aged at least 15 years, were mostly WRA (73%), married Muslims (87.4%) without formal education whose source of livelihood was farming (84.1%) and had households with sizes ranging between 6 and 40. At baseline, gender and socio-cultural factors significantly influenced all aspects of the food system, limiting women's access to quality foods. Animal-source food taboos, which are mostly gender-based and affect the quality of women's diets, were identified. At endline, these practices did not change but members of Yilkpene community were sensitized about them. Prior to the intervention, the dietary knowledge and attitudes among members of both communities were sub-optimal; but, at endline, improved knowledge and attitudes were observed in both communities even though the scope of improvements was more in the intervention community. There were also less reported beliefs about plant-source food restrictions at Yilkpene compared to Kpachilo. At baseline, close to half (45%) of women in either community could not meet their minimum dietary diversity but diversity deficit declined at endline (25% at Yilkpene and 10% at Kpachilo).

Conclusion: Attitudinal and behavioural change communication interventions on entrenched socio-cultural issues pertaining to women's diets need more prolonged and sustained durations to enhance their scopes of feasibility. Ghana Health Service and individuals should organize similar interventions.

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GLOSSARY

Definitions of commonly used terms and concepts

Term/concept	Definition
Attitude	The tendency to respond or act in a certain way to an event or situation based on one's belief or perception
Belief	An idea considered true or real
Community-based participatory action research	Research conducted in collaboration with the people mostly affected by an issue with the goal of devising strategies to address it
Community strategies	Community activities or interventions aimed at addressing a problem
Diets	The sum or the different kinds of food consumed by an individual or a population or a combination of foods with a series of nutrients reflecting the psychological and cultural attitudes of individuals and populations (Etievant et al., 2010).
Dietary practices	Actions or practices of people in respect of their food sources and choices; the context of food; preparation, variety, quality and quantity of foods consumed as well as pattern of meals
Formative research	Research that occurs before and during the implementation of a programme to understand and facilitate the creation of activities to meet the specific needs of the population
Knowledge	Right information about an issue based on a certain standard
Women's minimum dietary diversity	An assessment of the quality of women's diets by using the number of food groups consumed in their meals - FAO (2012) recommends that women who consume a minimum of five food groups in their meals can be classified as meeting their nutrient requirements for the day
Perception	Awareness of something and how one interprets it or one's opinion about something
Quasi-experimental design	A kind of intervention that seeks to test an association between two variables measured by pre-specified indicators- assignment of participants to intervention or comparison is based on selection by the researcher rather than randomization as in the case of Randomized Control Trials (RCT).
Socio-cultural	People's relations and interactions with the elements of culture
Women of reproductive age	Women aged 15 -49 years

LIST OF ABBREVIATIONS AND ACRONYMS

Abbreviation and acronyms	Full versions
ADRA	Adventist Development and Relief Agency
ADVANCE	Agricultural Development and Value Chain Enhancement
AGRA	Alliance for a Green Africa
ANC	Ante-natal care
BCC	Behaviour Change Communication
BMI	Body Mass Index
CBE	Complimentary Basic Education
CHPS	Community-owned Health Planning and Service
CRA	Community readiness assessment
CRM	Community readiness model
DDS	Dietary diversity score
DHS	Demographic and health survey
FAO	Food and Agricultural Organization
FGD	Focus Group Discussion
GDHS	Ghana demographic and health survey
GHS	Ghana Health Service
GOG	Government of Ghana
GSS	Ghana Statistical Service
HIV/AIDS	Human-Immuno Deficiency/Acquired Immune-Deficiency Syndrome
IPA	Innovation for Poverty Action
KII	Key –informant interview
LDDS	Low dietary diversity score
MDD	Medium dietary diversity

MDD	Minimum dietary diversity
MDD-W	Minimum dietary diversity -women
MDG	Millennium development goals
NGO	Non-governmental Organization
NMCCSP	National malaria control for child survival project
NMIMR	Noguchi Memorial Institute for Medical Research
PNC	Post- natal care
RAINS	Regional Advisory Information and Network Systems
RCT	Randomized control trials
RING	Resilience in Northern Ghana
SCT	Social cognitive theory
TBA	Traditional birth attendant
TZ	Tuo zaafi
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development
WDD	Women's dietary diversity
WFP	World Food Programme
WHO	World Health Organization
WIFA	Women In Food and Agriculture
WRA	Women of reproductive age

PREFACE- A PERSONAL REFLECTION

The researcher has a social science background and works in a medical research institution. As a research assistant, her mandate was to assist in fieldwork activities on a number of projects including infant and young child nutrition (IYCN), food security in deprived urban communities and maternal mortality studies. In all these projects, she was assigned to collect qualitative data using multiple qualitative methods, which helped in her understanding of socio-cultural influences on behaviour outcomes.

The researcher's interest in the area of public health intervention stemmed from one of the projects she worked on, in which a research participant needed an intervention addressing her child's malnourished status. It was at this point she felt the burden and need for the research community to empower research participants by making known to them their research findings even if the former do not intend to implement any intervention. In the opinion of the researcher, therefore, research findings must be made known to research participants and efforts made to help communities through the building of their capacity to address some of the challenges confronting them.

The researcher's background in nutrition-related research, therefore, informed her decision to undertake this study on the dietary practices of the rural woman and to design a context-specific attitudinal and behaviour change intervention addressing socio-cultural practices that are detrimental to women's dietary quality.

ORGANIZATION OF THE THESIS

This study is presented in six chapters. Chapter One is the introductory chapter, which gives a background to the study and contextualizes the problem related to women's diets. The theoretical underpinnings and justification for the study are highlighted together with the aim and objectives as well as the research questions guiding the study.

Chapter Two situates the study within existing and related literature on women's dietary situation and interventions aimed at addressing it in low-income countries and Ghana specifically. Additionally, a review of some methodological approaches and theories used in researches related to such interventions are reviewed.

The third chapter presents the methods for the study. The study location is presented alongside the study design and the study process. The data collection methods, instruments and variables investigated are presented with the analysis plan.

The fourth chapter presents the results of the study structured on the basis of the objectives. Participants' socio-demographic characteristics, results of pre-intervention (baseline study), community readiness assessment and implementation of intervention are presented. The last section presents results of the effect of the intervention.

Chapter Five presents a discussion of the main findings based on the objectives and the last chapter presents the summary of findings, conclusions and recommendations drawn from the findings. The theoretical, methodological and policy contributions, areas for further research as well as the limitations of the study are presented in this chapter. There are also appendices including the instruments used for the study.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the study

Undernutrition among women of reproductive age (WRA) is an important public health challenge in low-income countries. Women's undernutrition is particularly important in sub-Saharan Africa and South/South-East Asia, where at least 10% of WRA are reported to be under-nourished (USAID, 2012). In Ghana, an estimated 6% of women are currently under-nourished (GSS, GHS, & DHS, 2015; GSS, GHS, & ICF, 2015a; GSS, GHS, & Macro, 2009). Anaemia, which is linked with sub-optimal dietary quality and contributes to poor nutritional status, remains highly prevalent (42%) among women (GSS, GHS, & ICF, 2015b). The evidence demonstrates that these outcomes of nutritional status are more prevalent in Northern Region of Ghana, where 11. 2% of women are under-nourished and 47.5% are anaemic (GSS, GHS, et al., 2015b; GSS et al., 2009).

An important determinant of women's nutritional status is their diets (Global Panel on Agriculture and Food System for Nutrition, 2016). Diet, defined as the pattern of consumption involving the combinations of foods that reflect the cultural attitudes of people (Etiévant et al., 2010) is linked with the food system, which comprises all processes involved in keeping populations fed (Global Panel on Agriculture and Food System for Nutrition, 2016). The system is important for providing good-quality diets to meet the nutritional needs of communities (Kuhnlein & Peltó, 2014) and consists of all activities and techniques for production, acquisition, processing, preservation, storage, distribution and consumption of food (Kuhnlein & Peltó, 2014; Baden, Green, Otoo-Oyortey, & Peasgood, 1994). In Ghana, women play active roles in all aspects of the

system; women contribute about 47% of the agricultural labour force and account for about 70% of total crop production (Brammah, Dukuh, Oppong-Sekyere, & Momori, 2014; Mohammed, Solikua, & Mansega, 2013). In spite of their vital contributions to food security, women's diets and their implications for their health and reproductive health outcomes are often sub-optimal (USAID, 2012).

Women in northern Ghana have a unique experience of food and nutrition insecurity. It is estimated that 60% of households in northern Ghana consume inadequate quantities of food and 20% consume poor quality diets consisting mainly of staples, vegetables and oils (Saaka, Oladele, Larbi, & Zeledon, 2017; WFP, 2012). Seasonal effects on food access have been explained as a major contributory factor for the food insecurity situation in the region (WFP, 2012). A report by "Feed the Future project" further estimated that 40.5% of women in the three northern regions consume low-quality diets - an indication of low diversity in the diet (Zereyesus et al. 2014).

WRA's physiological needs make them more vulnerable to poor dietary intake. This vulnerability arises because their need for nutrient intake increases during adolescence, pregnancy and lactation but, as compared to men, women's energy intake is low (Galbete et al., 2017; FAO, 2009), indicating the food insecurity situation among them. When women are unable to meet their increased dietary needs, their dietary status is compromised (USAID, 2012).

Women's sub-optimal dietary practices including inadequate frequency of meals and poor qualities of diets are the commonest causes of their under-nourished status (USAID, 2012). Poor quality of women's diets is linked with multiple factors including personal

and environmental factors, agricultural practices, national policies, food security, socio-cultural and economic factors (Martínez Pérez & Pascual García, 2013; Haileslassie, Mulugeta, & Girma, 2013; Gadegbeku, Wayo, Badu, Nukpe, & Okai, 2013; Koryo-Dabrah, Nti, & Adanu, 2012; Puoane, Matwa, Bradley, & Hughes, 2006; Ogunjuyigbe & Ojofetimi, 2006).

Women are constrained by socio-cultural factors such as their social status and decision-making power over household food resources and control over them (Braimah et al., 2014). Cultural definitions of food, what constitutes food, what is edible, food taboos and food restrictions, food preferences and preferential food allocations, knowledge and perceptions about the health benefits of food and ease of acquiring food constitute some of the social norms affecting women's diets (Kuhnlein & Peltó, 2014). Other socio-cultural factors include the value placed on food, their perceptions of the relationship between food and body-size and the effects of urbanization (Puoane et al. 2006).

Women's diets have implications for their own well-being, productivity and health including their reproductive health and those of their children, community and nation (USAID, 2012; FAO, 2012a; Lartey, 2008; Johnson-Welch, 1999). Women with improved diets contribute positively to the development of society. Improvements in women's nutrition could further reduce hunger, mal-nutrition and maternal and infant morbidities and mortalities (Ransom & Elder, 2003). Effective nutrition-related interventions aimed at addressing challenges to women's nutrition and diets include nutrient supplementation and food-based strategies (Black et al., 2013; MacDonald, Neequaye, Namarika, & Yiannakis, 2009). In Ghana, these strategies have included fertility control, preventing infections, micro-nutrient supplementation for pregnant

women (iron and folate), improving agricultural productivity, food fortification, diet diversification as well as nutrition and health education (Zereyesus, Ross, Amanor-Boadu, & Dalton, 2014; GOG, 2013). Interventions have focused on addressing the direct causes of maternal undernutrition with emphasis on changing the individual's behaviour but less attention has been paid to the social context of nutrition, which has been identified (Aikins, 2014; Delormier, Frohlich, & Potvin, 2009; Lartey, 2008).

Delormier et al. (2009) have defined the social context of nutrition as the social nature of food and eating which is influenced by culture and experiences. The need for interventions to address societal norms linked with dietary behaviour has, therefore, been suggested (Delormier et al., 2009). Participatory interventions have demonstrated positive outcomes particularly for child nutrition in Ghana (Colecraft et al., 2012). Other studies have also found that interventions targeted at poverty, education and empowerment of women with productive resources contribute to improved maternal and child nutrition (FAO, 2012b; Underwood & Galal, 2004).

Slow progress in addressing women's undernutrition including their sub-optimal diets is partly attributable to limited attention to interventions that focus on the social context of women's diets. Even though community-based participatory approaches have been linked with improved dietary practices among children aged two to five years (Colecraft et al., 2012; Colecraft et al., 2006), there are currently few interventions in Ghana aimed at addressing socio-cultural barriers to women's diets through the use of community-based participatory approaches. Between 2004 and 2009, Colecraft and her colleagues conducted a participatory formative study to identify barriers to the consumption of animal-source foods among children aged 2 to 5 years old in Ghana. Results of this

initial assessment were fed into the design and implementation of an integrated intervention using participatory processes. The intervention activities involved micro-credit, entrepreneurship training and nutrition education and the beneficiaries of the intervention were caregivers (mostly women) with children two to five years old. The aim of the intervention activities was to improve and empower caregivers' access to and use of animal-source foods in children's diets. The outcomes of the intervention included improvements in caregivers' knowledge on child nutrition and their incomes and children's intake of animal-source foods. Similar participatory studies have yet to be conducted to address barriers to women's optimal diets.

1.2 Statement of the problem

Malnutrition is common among women in northern Ghana and this is partly because almost half of women in the region eat diets with low diversity (Zereyesus et al., 2014). In Savelugu-Nanton District, the study location, the prevalence rate of anaemia among WRA is very high (58%) (GHS, 2018) confirming the poor dietary situation in the district and the need for an intervention addressing this challenge.

Socio-cultural factors limit women's ability to access adequate quantities and qualities of food (Martínez Pérez & Pascual García, 2013). Existing interventions hardly focus on socio-cultural barriers to women's diets but on factors such as the immediate causes of malnutrition including access to and intake of a variety of foods (Lartey, 2008). The problem for the study, thus, is that in northern Ghana, there are unsolved questions relating to women's diets as follows: first, what are the socio-cultural influences on WRA's diets in northern Ghana, second, what is the readiness of communities to address

these socio-cultural barriers and, finally, what strategies can address these socio-cultural challenges?

1.3 Theoretical framework

Interventions influencing health behaviour are most likely to benefit their target audience when they are guided by appropriate theories of health behaviour (Glanz, Rimer, & Viswanath, 2008). Generally, behaviour change theories propose that, for an intervention to be successful, the determinants of the undesirable behaviour must be assessed to understand why people do the things they do and to use this understanding to develop an intervention targeting the undesired behaviour (Bandura, 1997). A number of health behaviour change theories have been propounded (Glanz et al., 2008); while some of these models focus on changing individual behaviour, others are inter-personal, focusing on changing group behaviour and bringing about social change. Examples of individual behaviour change theories include the health belief model, theory of reasoned action, theory of planned behaviour, transtheoretical model (theory of change) and the precaution adoption process model. The social cognitive theory and the theories of organizational change are examples of inter-personal theories. Among these theories, the social cognitive theory was the choice for the study mainly because it addresses inter-personal health issues confronting communities or groups of people.

The Social Cognitive Theory (SCT) (Bandura, 1997) was the main theory underpinning the study. The theory explains that human behaviour is a result of personal, social and physical (environment) factors (McAlister, Perry, & Parcel, 2008). The theory posits that these three interacting factors influence one another to bring about social change through human capacity for learning and adaptation. The theory further emphasizes that even

though the social and physical environments contribute to shaping people's cognition and behaviour, individuals have the ability to also influence the environment to bring about desirable social change through a collective action of the group. Figure 1.1 illustrates the dynamic interaction between personal as well as environmental factors and behaviour as proposed by the Social Cognitive Theory.

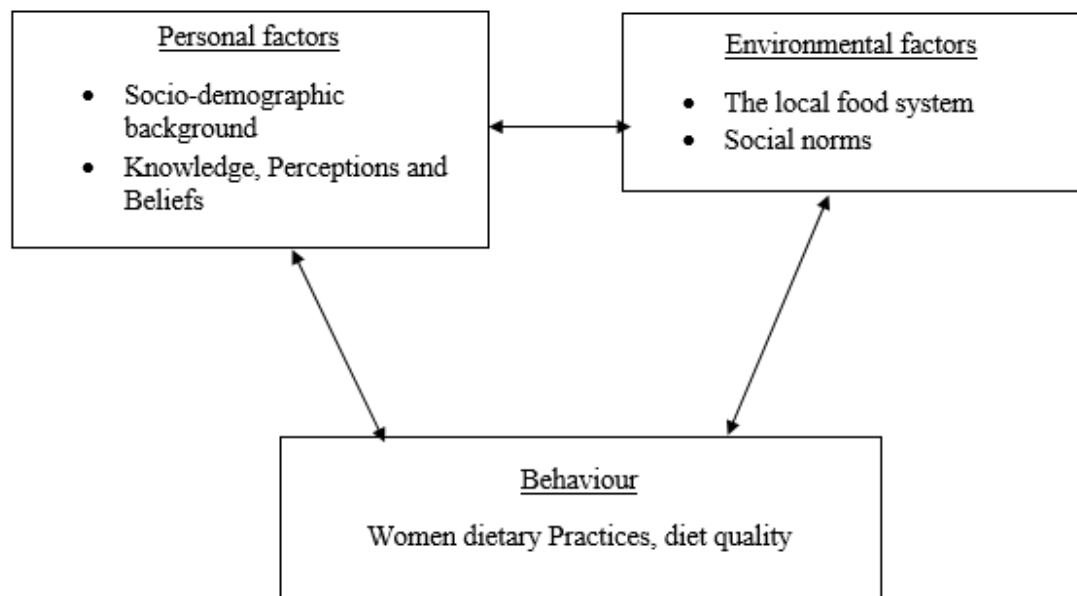


Figure 1.1: Adapted framework from the Social Cognitive Theory (Bandura, 1997)

The personal factors include sex, age, education, physiological status, awareness, knowledge, attitudes and self-efficacy. The social factors include group or social norms that determine what is acceptable behaviour such as food taboos and the physical factors include the physical resources and technology the community is endowed with.

In this study, the three interacting constructs of the Social Cognitive Theory were operationalized by distinguishing between modifiable and non-modifiable personal factors. The non-modifiable factors, which the study did not intend to change, included age, sex, marital status, education and income. The modifiable factors were community

knowledge and perceptions on diets and self-efficacy, which the intervention tried to influence. The physical environment comprised the food system, which included inputs for food production; kinds of foods produced; processing, preservation and storage; distribution and consumption of food at the household level.

The social norms included women's control over household food resources, food taboos and restrictions and the preferential food allocation system. Behaviour was operationalized to include preparation of food, access to food and dietary quality; however, because behaviour usually takes a long time to change, the study concentrated on improved dietary knowledge and perceptions as well as modification of food taboos as the immediate outcomes with the hope that the improved outcomes would eventually lead to improved dietary quality as depicted in the broken arrows in Figure 1.2.

The concepts self-efficacy, collective efficacy, observational learning and facilitation of the social cognitive theory were used in this study to facilitate change in the intervention community. Self-efficacy is the belief about one's ability to change or bring about a desirable behavioural outcome. The theory maintains that if human behaviour is a product of what people have learnt, their perceptions of the environment and their intellectual and physical capacities, then behaviour can equally be changed or modified through new learning experiences, guidance on people's perceptions and support for the development of their capacities.

Increasing individual self-efficacy was achieved through two mediating strategies: observational learning and verbal persuasion. Observational learning is the process of learning to perform a new desired action by being exposed to inter-personal display of

that behaviour while verbal persuasion is a form of encouragement or advocacy to motivate a person or group to adopt a new behaviour. Facilitation implies providing tools and other resources that make the new behaviour easier to perform. These concepts were operationalized through the use of nutrition and dietary education to members of the community. Collective efficacy is the belief that the group has the ability to use concerted action to bring about desired change for the benefit of the whole group (McAlister et al., 2008). Collective efficacy was enhanced through the participatory nature of the intervention whereby all stakeholders and the community at large were involved in the intervention process.

The SCT was deemed appropriate in informing the current study because its focus was on addressing socio-cultural barriers to women's optimal diets. Socio-cultural practices are aspects of group/social norms that influence and shape women's diets. There was, therefore, the need to employ the concepts self-efficacy and collective efficacy to address issues relating to knowledge and perceptions and at the same time get the community or group involved in a concerted effort to begin to think about and possibly address some of the socio-cultural barriers to women's diets.

The SCT does not provide a pathway for determining community readiness for change or modifying socio-cultural influences that constitute barriers to women's optimal diets. The community readiness model (CRM) was, therefore, used as a tool to determine the intervention community's readiness to implement strategies to address women's dietary challenges. The CRM is a participatory tool used to assess community knowledge, attitudes, efforts and resources pertaining to specific community issues that need to be addressed (Edwards, Jumper-Thurman, Plested, Oetting, & Swanson, 2000). There are

five key dimensions for measuring community readiness for action: first, community knowledge about the issues to be addressed; second, community efforts and knowledge of efforts addressing the problem; third, leadership within the community; fourth, community climate and, fifth, resources related to the issues. These dimensions are scored against nine stages of community development (Stanley, 2014).

1.4 Conceptual pathway of change for socio-cultural intervention on women's diets

Informed by the social cognitive theory and using the community readiness model as a tool, a conceptual pathway to attitudinal and behaviour change was developed to address identified socio-cultural barriers to women's diets in one of the study communities. Presented in Figure 1.2 is an illustration of the pathway of change.

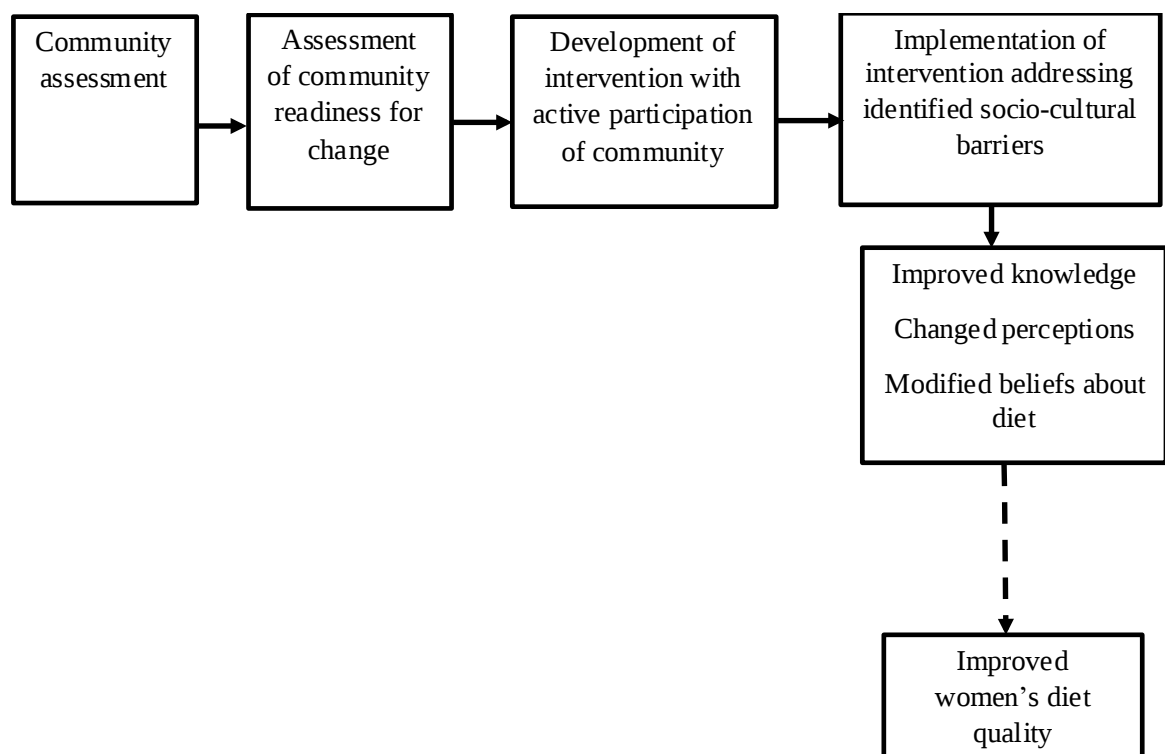


Figure 1.2: Pathway for attitudinal and behaviour change on women's diets

Figure 1.2 demonstrates that, to introduce an intervention addressing barriers to women's dietary quality, the determinants of women's diets must be assessed and understood. In this study, the personal, social (and cultural) and environmental (physical) factors were assessed. The personal determinants included participants' socio-demographic characteristics as well as their dietary knowledge and perceptions. The socio-cultural factors included issues of women's empowerment such as their control over productive and food resources as well as beliefs and discriminatory food practices. The environmental (physical) factors included availability of and access to productive resources such as land and labour, climate and seasonality as well as methods of processing, preservation, storage and preparation of food.

The assessment of the determinants of women's diets was followed by an assessment of the intervention community's readiness to change. Because the intervention was participatory, community and stakeholder engagement processes were utilized to assess its feasibility for addressing identified socio-cultural barriers to women's diets. The intervention was then designed with the active participation of members of the community and implemented. It was envisaged that improving community members' knowledge and perceptions as well as modifying their beliefs and attitudes regarding women's diets could lead to changes in behaviour that would enhance women's capacity to observe improved dietary practices and, ultimately, improved dietary quality (indicated in Figure 1.2 with broken arrows).

1.5 Justification of the study

Improving women's diets can contribute to addressing the high burden of hunger and malnutrition (FAO, 2012b). Women's role as producers of food for their families and reproduction of future generations makes it important for their dietary needs to be

provided (USAID, 2012; Johnson-Welch, 1999). In Northern Region, women's nutritional indicators including their dietary quality lag behind those for the other regions. Exploring the basic factors would yield new evidence on socio-cultural barriers to women's optimal diets in the communities studied and others with similar characteristics.

Second, in Ghana, the use of the community readiness model in designing interventions addressing dietary challenges has not been reported in the scientific literature. This model, however, has been used in some countries including the United States of America, South Africa and Liberia in HIV/AIDS and obesity related interventions (Pradeillis, Rousham, Norris, Kesten, & Griffiths, 2016; Kostadinov, Daniel, Stanley, Gancia, & Cargo, 2015; Findholt, 2007) to demonstrate the level of readiness of communities to address these public health challenges. Results of this study would therefore further demonstrate the relevance of the model and indicate the level of readiness of communities to address socio-cultural influences on women's diets.

The study would further add to the existing body of knowledge on the kinds of interventions that are relevant in addressing socio-cultural-related challenges to women's diets. For example, working with members of the community to give women the autonomy to make household food choices could contribute to improve women's contribution to household food security and their own dietary needs. Additionally, working with members of the community to modify taboos or beliefs that restricted some categories of women from consuming certain foods would lead to improvements in the quality of their diets. Ghana Health Service and other community-based organizations working in nutrition-related activities in rural settings would utilize the evidence from the study.

1.6 Objectives of the study

1.6.1 General objective

This study aimed to describe barriers to consuming nutritious diets among WRA and to test the feasibility of an attitudinal and social-behaviour change communication intervention to address socio-cultural barriers to optimal diets among women at Yilkpene in Savelugu-Nanton District of Ghana.

1.6.2 Specific objectives

The specific objectives of the study were:

1. To describe women's interaction with the food system in Savelugu-Nanton District
2. To assess dietary knowledge and attitudes (perceptions and beliefs) at Yilkpene and Kpachilo in Savelugu –Nanton District
3. To describe women's dietary practices at Yilkpene and Kpachilo
4. To describe the drivers of the dietary choices among women at Yilkpene and Kpachilo
5. To assess community members' readiness to modify socio-cultural barriers to women's optimal diets at Yilkpene
6. To assess the post-intervention change in community dietary knowledge and attitudes (perceptions and beliefs) at Yilkpene.

1.7 Research questions

The study sought to answer the following research questions to achieve its objectives:

What is women's role in the local food system and how does it influence their diets in Savelugu-Nanton District?

What personal, household and community-wide beliefs and practices influence women's dietary behaviour in the district?

Who are the change agents in the community and what is their capacity to modify community norms that affect women's diets in the community?

Are there any changes in community dietary knowledge, attitudes and practices after the social-attitudinal and behaviour change intervention?

CHAPTER TWO

2.0 LITERATURE REVIEW

This chapter contains six parts: dietary practices of women of reproductive age, determinants of their dietary practices, interventions addressing barriers to optimal diets, methodological and theoretical considerations and gaps identified in the review. Each part is sub-divided into general information and specific information about Ghana. The two main types of literature reviewed were theoretical and empirical.

2.1 Women's dietary practices

Women of reproductive age are females aged 15-49 years. They comprise pregnant women, lactating mothers as well as women who are neither pregnant nor lactating (Zereyesus et al., 2014). In Ghana, women constitute 51.7% of the total population (GSS, 2012).

A diet is a pattern of consumption involving the combinations of foods reflecting the cultural attitudes of people (Etiévant et al., 2010). Dietary behaviour describes the characteristics of usual dietary intake including types of food, quality (measured as variety of food groups consumed over a period of time and meal composition), frequency of consumption and quantity consumed in a given period. Dietary behaviour is influenced by multiple factors that drive food choices including the food system- that is, food production and supply processes, access, sources of food, methods of food preparation and meal time practices and food preferences (Global Panel on Agriculture and Food System for Nutrition, 2016; Etiévant et al., 2010).

Dietary behaviour is an important indicator for public health intervention because it is often measured as an outcome of how social, physical environmental and personal factors interact to affect nutritional health and status (Stok et al., 2016; Glanz et al., 2008). Women's dietary quality and intake have been reported to be sub-optimal globally but particularly in low-income countries (Martin-Prevel et al., 2017; Amugsi, Lartey, Kimani-Murag, & Mberu, 2016; Global Panel on Agriculture and Food System for Nutrition, 2016). The Global Panel on Agriculture and Food Systems for Nutrition (2016) indicates that globally, about three billion people consume low-quality diets with important implications for multiple forms of malnutrition with negative consequences for global health.

The authors attribute the low-quality diets to rapid population growth, climate change and urbanization. In addition, women's low dietary quality and intake have been attributed partly to the physiological demands of adolescence, pregnancy and lactation (Underwood and Galal, 2004). Pregnancy increases the nutrient needs of women up to about 300 extra calories a day compared with non-pregnant women of similar age but most WRAs are unable to meet this increased nutrient demand (Ransom & Elder, 2003). As a result, micronutrient mal-nutrition, also known as "hidden hunger", is very common among WRA (Ramakrishnan, 2002). Women's access to adequate and nutritious foods as well as their dietary practices also determines their dietary intake and dietary quality (Underwood & Galal, 2004; Gittelsohn & Vastine, 2003).

2.1.1 WRA's dietary practices in Ghana

Women's dietary situation in Ghana has been reported to be sub-optimal (Armar-Klemesu et al., 2014; Kobati, Lartey, Marquis, Colecraft, & Butler, 2012; Koryo-Dabrah

et al., 2012). The majority of non-pregnant and non-lactating women in both the coastal and guinea savannah zones have low energy intake; the deficiency is even greater among women in the latter zone. They also consume insufficient quantities of protein, vitamin A, vitamin C and niacin (Seshadri, 2001). The sub-optimal consumption of nutrients is a result of women's dietary practices throughout the life-cycle (Nana & Zema, 2018).

Women's dietary pattern in Ghana is influenced by socio-demographic characteristics such as residence, age, income and social status. While urban women were more likely to consume foods prepared from grains, proteins, fat and oils, rural women were more likely to consume foods prepared from legumes, roots and tubers and vitamin A-rich foods. In addition, younger women or adolescents (15-19 years) consume more sugar-based foods and less food prepared from milk, fats and oils and butter. Fewer women from poorer socio-economic backgrounds tended to consume foods from all food groups (FAO, 2009).

In Brong Ahafo Region, women's diets were more diverse, dominated by maize, roots and tuber-based staples and consumed with soups, stews and sauces. On the contrary, in Northern Region, women's diets were reported to be monotonous and dominated by grain-based foods with low consumption of fruits and vegetables (Armar-Klemesu et al., 2014). Saaka et al., 2017 confirmed that the main staple foods in northern Ghana including Savelugu-Nanton comprise maize, sorghum, millet and yam, which are predominantly energy-giving foods. In their study, 60% of households in the region were classified as food insecure and therefore, less likely to consume fleshy foods, dairy products and vegetables among others (Saaka et al., 2017). As a result of the poor diversity in their diets, women in Northern Region tended to be more under-weight than

their counterparts in Brong-Ahafo Region (Amoateng, Doegah, & Udombosu, 2017; Armar-Klemesu et al., 2014).

2.2 Consequences of inadequate dietary intake

The most common micronutrient deficiencies among WRA include iron, vitamin A, iodine, folate and zinc (Harika et al., 2017). Inadequate intake of food leads to increased risk of a mother becoming under-nourished, and this, in turn, can lead to low weight-gain during pregnancy. Foetal malnutrition can lead to low birth-weight and pre-term births. Studies have shown that the more variety there is in an individual's diet, the better the quality of the food in terms of its micronutrient adequacy (Saaka, 2012). In a study in northern Ghana, women who consumed low-diversity diets had babies with lower birth-weights than mothers who consumed high-diversity diets (Saaka, 2012).

In Ghana, the prevalence rate of low birth-weight is estimated at 11% (FAO, 2009; GSS et al., 2009), an indication of women's poor dietary intake. Women's poor dietary status has negative effects on themselves and their unborn babies. Children born with low birth-weight are at great risk of increased mortality and morbidity while those who survive into adulthood are likely to enter a lifetime of reduced developmental potential and increased risk of chronic diseases. Stunted growth in infants also contributes to reduced mental capacity, stunted adolescence and, when the child is female, she stands a higher risk of experiencing obstetric complications during pregnancy owing to having a small pelvis, and the vicious cycle can continue unless broken by an appropriate intervention (Levay, Mumtaz, Rashid, & Willows, 2013b; Underwood & Galal, 2004). The effects of women's undernutrition are higher maternal mortality, impaired mental development and increased risk of maternal morbidity including chronic adult diseases

(Levay, Mumtaz, Rashid, & Willows, 2013a; Ransom & Elder, 2003). The FAO's nutrition profile of Ghana (FAO, 2009) identified the three northern regions as those with the most serious burden of undernutrition and food insecurity. The poor state of food security in the these three regions was supported by a report of the World Food Programme and Saaka and his colleagues who confirmed that while 20% of households in northern Ghana consumed low quality diets, 60% consumed inadequate quantities of food (Saaka et al., 2017; WFP, 2012).

2.3 Determinants of women's dietary practices

Three sets of determinants of women's dietary practices have been identified. These determinants are personal, socio-cultural and environmental factors. These determinants contribute to the creation of barriers that make the consumption of healthy diets difficult for women and other population groups. A good understanding of these determinants is, therefore a prerequisite for designing effective social and behaviour change interventions addressing women's dietary challenges (Farahmand, Tehrani, Amiri, & Azizi, 2012).

2.3.1 Personal Factors

Personal factors, that characterize the individual himself or herself, include knowledge, beliefs, perceptions and attitudes towards food and nutrition-related issues; educational attainment as well as their food preferences and physiological statuses. These factors influence their dietary quality and intake (WFP 2005). Food is often characterized based on perceived quality and appropriateness for consumption (Gittelsohn, Haberle, Vastine, Dyckman, & Palafox, 2003). Knowledge, perceptions and meanings of food linked with dietary behaviour have been reported in a qualitative study in South Africa (Puoane et al., 2006). Accordingly, high educational attainment is linked with improved knowledge

about food and nutrition, which contributes to improved diets and, ultimately, nutritional status (FAO, 2012b). Formal education is associated with increased knowledge about the benefits of good nutrition and healthy dietary behaviour including the intake of fruits and vegetables (Amoateng et al., 2017; Dunneram & Jeewon, 2015; FAO, 2012b; WFP, 2005).

Farahmand et al. (2012) indicate that women's and other family members' food preferences were important contributing factors to consumption of poor quality diets among women in an Iranian community in a qualitative study on barriers to healthy nutrition among women. Additionally, women's inadequate knowledge or information on healthy diets, their inability to distinguish between what is healthy and unhealthy as well as their lack of knowledge on appropriate methods of food preparation contribute to their poor dietary choices.

In Ghana, Nti et al. (2002) found that even though 83% of pregnant women had some knowledge of the nutritive qualities of foods (energy-giving, body-building and protective) they consumed, some women were unable to translate this knowledge into their dietary habits owing mainly to financial constraints; thus debunking the notion that good knowledge of the nutritive qualities of food leads to improved dietary intake. Farahmand et al. (2012) confirmed the assessment that a good dietary knowledge does not always translate into consuming healthy diets. According to de-Graft Aikins (2014), women's knowledge about food was drawn from a number of sources termed "lifeworld" sources - that is, family and friends, educational settings, health professionals, mass media and women's unique pregnancy-related expectations. Although women may not have "expert knowledge" of the nutritive qualities of foods, their "social or lay

knowledge” of nutrition was similar to expert knowledge. Expert knowledge implies the scientific or medical recommendations of foods grouped into high- or low-nutrient densities. Physiological factors such as loss of appetite, nausea and vomiting have been found to influence dietary practices among pregnant and lactating women (Aikins, 2014; Armar-Klemesu et al., 2014; Koryo-Dabrah et al., 2012; Nti, Larweh, & Gyemfua-Yeboah, 2002).

2.3.2 Socio-cultural factors

Socio-cultural factors refer to the way family, community and extra- community systems are organized for the management and consumption of food in the community and at the household levels. For instance, a study among Iranian women revealed that some social and cultural barriers to women consuming nutritious diets include unhealthy behavioural modelling in the form of unhealthy eating pattern of the family, peers and community that are imitated by other members and inappropriate prioritization of the family budget. Here, non-food items may be prioritized above nutritious foods.

Other social barriers identified were time limitations to prepare nutritious diets partly as a result of women working outside the home and poor hygiene around food environments (Farahmand et al., 2012). Socio-cultural factors also include social norms that govern the way resources are controlled at both the community and household levels and their impact on behaviour. Socio-cultural issues discussed in this section include women’s social status and decision-making power, food taboos and restrictions and preferential food allocation system.

2.3.2.1 Women's social status and decision-making power

In Ghana, women's participation in labour-intensive farming activities and household chores places a lot of demands on their energy. The heavy workload has been identified as a major factor for women's poor diets (Ransom & Elder, 2003; Nti, Inkumsah, & Fleischer, 1999). The heavy workload necessitates their leaving home early and, thus, compromising their diets and child care practices (Saaka et al. 2017). Women's multiple roles create many physiological problems for them especially general weakness and tiredness, body pains; headaches, dizziness, arthritis and malaria (Nti et al., 1999). Insufficient energy intake among WRA could be met by a reduction in pregnant women's physical activity (IFAD, 2013). On the contrary, this reduction in women's physical activity is difficult to achieve considering the social norms in low-income countries. Most women are unable to meet their daily nutrient requirements and are, thus, prone to micro-nutrient mal-nutrition (Martin-Prevel et al., 2017; Underwood & Galal, 2004).

A positive link has been established between women's decision-making power on the one hand and their dietary diversity and quality on the other hand (Amugsi et al., 2016; Levay et al., 2013a; Niloufer, Syed, & Rahat, 2003). It is believed that women's control over food purchases is linked with the quality and quantity of food available to the household. Levay et al. (2013) linked maternal mal-nutrition in Bangladesh to many factors including the patriarchal gender-order that inhibits mobility and decision-making among women including decision-making regarding food consumption. Women's lack of decision-making power has also been reported in Ghana (Mohammed et al., 2013). The evidence indicates that in spite of their efforts to achieve food security, most women in Ghana face enormous challenges in accessing and controlling productive resources to

carry out their roles. Land rights in the patriarchal societies are held by men and women may only be able to access land through their male relatives such as fathers, husbands and brothers. In the exceptional situations in which women are self-employed farmers, many of them are widows, divorcees or women whose husbands have migrated to seek employment elsewhere (Bambangi & Abubakari, 2013; Mohammed et al., 2013).

Women's participation in decision-making in household food purchasing and other aspects of household decision-making (money spending, ability to refuse sex and opinion on wife-beating) was found to be significantly associated with higher dietary diversity (Amugsi et al., 2016). The assessment further revealed that women from monogamous homes had higher dietary diversity scores than those from polygamous homes. The authors concluded that improving women's decision-making autonomy to buy nutritious foods could have a positive impact on their dietary quality.

Social status within a household influences dietary behaviour within it. Men in most cultures are usually those who attain the highest status in most households (Gittelsohn & Vastine, 2003). Leroy et al. (2008) reported that in northern Ghana, extended households comprise multiple family units. Each family unit in turn, comprises a male, his wives and children and the oldest male assumed the role of head of the household. The head of the household has the responsibility of making resources such as land accessible to other members of his household in addition to allocating food resources from its stores for consumption by the whole household. Leroy et al. further reported that the first wife of the families making up a household wields more decision-making power than her co-wives - thus, giving her more access to better quality food (Leroy, Razak, & Habicht, 2008). The strategies to improve women's diets should focus on promoting the decision-

making power at the household level. Issues at stake here included improving household wealth, promoting female education and encouraging monogamous marriages (Amugsi et al., 2016).

2.3.2.2 Food taboos and restrictions

Two sets of food prohibitions have been described: permanent and temporary or transitory food prohibitions (Gittelsohn et al., 2003). Permanent food prohibitions are usually associated with cultural or religious groups such as the avoidance of pork by Muslims. Adherents of Islam constitute the majority population in Northern Region of Ghana (GSS, GHS, & DHS, 2015). The permanent avoidance of selected foods creates a group identity and differentiates them from other groups (Senah, 2003). Usually, violation of such prohibitions attracts sanctions. Temporary or transitory food prohibitions affect individuals or sub-groups of populations such as pregnant women, the sick and children or during the post-partum period (Gittelsohn & Vastine, 2003).

Animal-source foods have been found to be the most commonly-prohibited foods (Gittelsohn & Vastine, 2003). The existence of food taboos in most cultures, which aim at creating a unique identity for people who belong together or are from the same clan, has been reported (Senah, 2003). Food taboos pertain to putting restrictions on the consumption of certain foods considered to have adverse effects either on the persons who consume them or on other members of the group. Food taboos mostly affect children, the sick and women of child-bearing age (Gittelsohn & Vastine, 2003). Food restrictions during pregnancy and lactation exist in Pakistan and many other cultures. Hot and oily foods are among the major foods restricted during pregnancy while cold and heavy foods are the main ones restricted during lactation in Pakistan. Restrictions in

other societies include meat and fish in Sudan, buffalo milk in India, fish, curd, grape, pineapple, mango, coconut, melon, sugar-cane and long banana in Vietnam (Niloufer et al., 2003).

The role of food taboos has further been emphasized in reviews of literature (Ogunjuyigbe & Ojofetimi, 2006), facility-based cross-sectional surveys (Niloufer, 2003) and qualitative studies (Monterrosa, 2017; Arzoaquoi, 2014b; Martínez Pérez & Pascual García, 2013). Even though poverty and ignorance are major contributory factors to malnutrition, the vital role of food taboos could not be underrated in sub-Saharan Africa. In Nigeria, pregnant and lactating women are prohibited from consuming foods such as cow pea, certain categories of leafy and green vegetables and fruits, mutton, bush meat and snail (Ogunjuyigbe & Ojofetimi, 2006).

It is perceived that the consumption of the foods leads to adverse outcomes such as an unusually large baby, which affects normal delivery (cowpea and mutton), nausea (guava), worms in mother's stomach (mango), dizziness and slippery/slimy stools (some leafy and green vegetables) and animalistic behaviours in children (bush meat). Because these foods are nutrient-dense, prohibition affects women who need more energy and nutrients to facilitate their physiological functioning (Martínez Pérez & Pascual García, 2013).

Reported food taboos linked to pregnancy in Ghana include snails in southern Ghana, groundnut and meat in Kassena-Nankana District of Upper-East Region and egg in all regions of the country (Senah, 2003). The rationale for the taboo against the consumption of snail is to prevent the drooling of the child. The egg taboo is to prevent

the baby from becoming a thief. The meat and groundnut taboo is to prevent the birth of “spirit children”. Pregnant women are prevented from purchasing vegetables such as tomato, pepper, okro and garden-egg from the market in order to protect the unborn child from developing skin rashes and physical disability later in life (Senah, 2003).

In Ghana, Arzoaquoi (2014) has reported the presence of food taboos and beliefs during pregnancy in Yilo Krobo District of Eastern Region. He reported universal awareness of food taboos and beliefs during pregnancy which included snail, rat, “hot foods” and animal lungs. Arzoaquoi’s list of prohibited foods was similar to that of Senah (2003). The study further indicated that the study population understood food taboos as forbidden foods and that the desire for healthy pregnancy outcomes and respect for the ancestors and elders of the community were the main reasons for adhering to them.

In spite of the negative influences of food taboos on the dietary practices among lactating and pregnant mothers in Ghana, it is usual for lactating mothers to be encouraged to consume foods that are perceived to give strength and blood such as palm soup, groundnut and light soup, mashed kenkey, beverage and porridge (Armar, 1989). These foods are perceived to enhance production of breast-milk. Other practices such as massaging the breasts with shea-butter and herbs and the consumption of herbal preparations are encouraged for lactating mothers to enhance production of breast-milk. Armar’s findings have been corroborated by Hailelassie et al. (2013) in a cross-sectional study in Ethiopia.

Dietary restrictions contribute to anaemia, malnutrition, low birth-weight and intra-uterine growth retardation while consequently worsening pregnancy outcomes (Niloufer

et al., 2003). Perez and Garcia (2013) have concluded that food taboos among the Fullas and other peoples in Africa contribute to protein-energy malnutrition among children as well as pregnant and lactating mothers (Martínez Pérez & Pascual García, 2013). On the contrary, the influence of food taboos on women's dietary practices is considered low (Levay et al., 2013a). Levay et al. explained that in Bangladesh, the taboos were not generally followed although most women avoided a specific type of fish called “mrigal maach” because they believed consuming it caused “mrigy” (epilepsy) in the baby.

2.3.2.3. Preferential food allocation practices

Preferential food allocation limits the intake of food in a population (Gittelsohn & Vastine, 2003). The authors explained preferential food allocation to involve the distribution of food at the household level on the basis of how some household members were valued above others including favouritism of males over females and adults over children. Valuation of some household members above others is linked to their economic contributions, social statuses, social relationships and power relations. Gittelsohn and Vastine indicated that preferential food allocation has more impact than cultural food restrictions or taboos on household food allocation.

Foods that are differentially allocated are luxurious, scarce and expensive such as animal-source foods. The natures of these preferential food allocations vary by context: while adults are favoured over children in one society, the reverse is the case in another society. In some settings, men are favoured over women while in others, women are favoured (Gittelsohn et al., 2003). Preferential food allocation has been observed among women especially during situations of severe food insecurity in some parts of Ghana. Armar-Klemesu et al. (2014) reported that women of reproductive age may restrict food

consumption during periods of food insecurity as a coping strategy to ensure that other members of their households, especially children, get enough food to eat. In some cases, women serve the other members of their households first and, if there is some food left, they could then eat – thus, limiting the quantity and quality of food available for them.

2.3.3 Environmental (physical) factors

The physical environment includes the climate, soil as well as mineral and water resources the society is endowed with to meet human needs for survival including the nutritional needs. The physical environment, for instance, influences the kinds of agricultural activities and the variety of crops and animals available to the population as food (Kuhnlein & Pelto, 2009; Kuhnlein & Receveur, 1996).

The food system and women's involvement in northern Ghana

According to FAO (2007), a food system is an interaction between and within the physical and human environments that influences activities and outcomes of the food chain beginning from food production through processing, preservation, storage, preparation, distribution to consumption at the household level (FAO, 2007). The food system consists of all processes mankind undertakes to ensure populations are fed (Cassidy & Patterson, 2008); thus, food supply, environments and consumers are all part of the system (Global Panel on Agriculture and Food System for Nutrition, 2016). Interaction with the food system, through the inter-related activities of production to consumption of food, enhances a population's ability to address their nutritional and health needs while at the same time promoting the socio-economic and environmental well-being of their communities (Kuhnlein & Pelto, 2009). Owing to rapid population growth, climate change and urbanization, however, food systems are failing to need the

nutritional needs of population by focusing more on producing large quantities of food while compromising on quality. The result is that consumers are unable to make healthy dietary choices with optimal nutritional outcomes (Global Panel on Agriculture and Food System for Nutrition, 2016). There is, therefore, the need to reverse the current trends in food systems to achieve the goal of healthier diets for all.

The food system is one of the components of the ecological framework for understanding the social aspects of nutrition (Kuhnlein & Peltó, 2009). The performance of the food system at the global, national, regional, local or community levels partly determines the food security situation of a population; therefore, to achieve food security, there must exist effective food systems in all populations (Tacoli, Burkhari, & Fisher, 2013). Kuhnlein and Peltó (2009) posited that even though food is made available through the physical environment (food system) and constitutes the main source of human nutrition, its accessibility and consumption are influenced by social and cultural factors. Understanding how these socio-cultural factors influence nutrition is very important when addressing nutritional issues in a community (Delormier et al., 2009; Lartey, 2008). In their article “*Ethnographic aspects of human nutrition*”, Kuhnlein and Peltó (2009) outlined four activities involved in the food system pathway: food production and acquisition; food processing, preservation, storage and preparation; distribution; and, consumption and biological utilization.

Food production: The joint-activity of food production and acquisition involves the adaptive mechanisms for the growing of crops and rearing of animals and fish to sustain and promote human growth and health. Five strategies have been described as mechanisms man has devised in acquiring his food over the years. These strategies are

hunter-gathering, pastoralist, horticulturalist, intensive agriculture and industrial agriculture food systems. Even though some of these strategies are fading out and giving way to mechanized ways of acquiring food, some rural societies may still exhibit characteristics of some of them. It is important to note that these strategies of food production influence people's social organizations and culture.

In Ghana, the traditional labour-intensive way of farming is the norm in rural communities (Darfour & Rosentrater, 2016). Most rural households produce foods from their farms and store them to last throughout the year, supplementing them with foods purchased from the market (Armar-Klemesu et al., 2014). In urban areas, however, acquisition of foods is done mostly through buying them from the market (Armar-Klemesu, 2000). The factors that influence the purchasing decisions of women in Ghana include availability of money, what food to eat, number of people in the family, cost of food items and time available to prepare the food.

In northern Ghana, small-scale farming (less than 5 acres of land), involving 62% of farming households is the main livelihood activity of the people (WFP, 2012). Women, who constitute the majority of small-scale farmers, are mostly disadvantaged when it comes to access to productive resources such as land, inputs, irrigation facilities, credit facilities and the services of extension officers (Agarwal, 2014; WFP, 2012). Accounting for this limited access to productive resources by women is the patriarchal nature of the society, which perpetuates the control of land in the hands of men (Bambang & Abubakari, 2013; Doss & Morris, 2000). Ministry of Food and Agriculture (MOFA) reported that, even though the adoption of improved or innovative ways of production is limited in the region owing to limited household resources to afford such services, there

is lack of sensitivity to women's needs when it comes to the design of agricultural innovations and extension services (MOFA, 2010).

Food production heavily depends on the climate. Foods produced including staple crops such as cassava, cowpea, maize, rice and yam have very low annual yields and low economic returns to farmers (MOFA, 2010). In Ghana, it is generally difficult to distinguish between men's and women's crops. Both men and women cultivate whatever crops they are capable of producing but there are a few crops whose cultivation is dominated by either men or women, hence, there exist some gender-based patterns of cropping (Doss & Morris, 2001). While some crops have more women involved in cultivating them, others are more likely to be grown by men than by women.

Doss (2001) indicates that the crops in Ghana that may be considered men's crops include rice, sorghum, tobacco and coffee. Doss is of the opinion that even though both men and women in Ghana are involved in producing for both home consumption and sale, men are more involved in cash crop production while women dominate in producing for home consumption. Even though agriculture is the main livelihood source in northern Ghana, the low level of productivity makes it impossible for the zone to be self-sufficient in terms of food production.

Worsening the food insecurity situation in northern Ghana is the limited opportunities for off-farm income-generating activities especially in the rural areas, making it difficult for the capacity of households to be able to offset the shortfalls in their own farm outputs. Livelihood diversification comes with crop and animal production, trading in food crops,

some dry season farming (for communities with rivers near-by) and remittances from migrant household members (Aasoglenang & Bonye, 2013).

Food processing, preservation, storage and preparation: The development of manual techniques of processing and preservation of food such as drying, salting, fermentation and milling is dominated by women in northern Ghana. Some of these processing techniques improve their nutritive qualities (Sanjukta & Rai, 2016). Use of plant ash and fermentation to dry and process maize results in improved nutritional quality of maize. In addition, some food-processing techniques bring about new flavours and textures. In Ghana, a number of food items are locally processed before they are prepared into edible states. Maize and cassava are typical examples of locally-processed food items. Drying of fish and meat is also common. Commercial processing and canning of palm-fruit, cassava, plantain and cocoyam for fufu are more recent examples of food processing in Ghana. Mechanized techniques such as canning help to extend the shelf-lives of foods.

Preparation of food involves the processing of food into an edible state ready for consumption at the household level. This activity is dominated by women and influenced by factors such as the type of meal and when it is eaten, the household members' preferences, money available, family members' physiological and health needs, size of the family and prices of foods. The other factors enumerated by Armar-Klemesu (2000) included where to acquire the foods and the equipment used in cooking. The most commonly-used equipment for preparing and cooking most Ghanaian foods consists of firewood and charcoal in rural communities in contrast with gas and electric cookers together with charcoal in urban communities.

Food distribution: Food is distributed through outlets such as farm gates, markets, supermarkets, other retail shops, schools and homes. Both men and women are involved in food distribution. The outlets provide consumers with a wide variety of food items. The effectiveness of these outlets of distribution, however, depends on the transport system and proximity of food to consumers (Darfour & Rosentrater, 2016). In places where the transport system is efficient and food outlets are near to consumers, they are more likely to have easy access to food. The cultural aspect of food distribution involves the kinds of food that are believed to be appropriate for different categories of members of a household. This manner of food distribution in the household is affected by the cultural belief system in the community.

The practice of giving preferential treatment to men when sharing meat at the household level and the buffering of young children in times of food shortages at the expense of adults are examples of the effects of culture on the food distribution practices of populations at the household level (Kuhnlein & Peltó, 2009). Ceremonial and individual life-cycle events, which are commemorated with feasting, offer opportunity for foods rich in some nutrients to be distributed within the community. Examples of such feasts are marriage ceremonies and funerals. The other forms of food distribution include charity from the rich to the poor (Hossain, 2012) and food distribution through governmental and non-governmental organizations to people in need.

Food consumption: Food consumption at the household level or within families and communities is affected by cultural rules (Douglas, 2014; Whitehead, 1984). Cultural beliefs determine, for example, what food is either edible or not edible, what constitutes a meal or which foods are restricted for spiritual or ceremonial purposes. The household

food consumption pattern in Ghana indicates a trend towards three meals a day for most households (FAO, 2009). These foods are either home prepared or purchased ready-to-eat (RTE) within the community. Ready-to-eat purchased foods have become very common in most parts of the country. Their consumption is, however, influenced by the availability of money, the need to vary foods consumed on a daily basis, the absence of family members from home (either working or in school), increasing numbers of women working away from home for long hours and absence of food items at home (Underwood & Galal, 2004; Armar-Klemesu, 2000).

Food security issues

Food insecurity has been identified as an important cause of women's poor dietary status in Bangladesh (Levay et al., 2013). Insufficient access to food directly reduces the quantity and quality of food available and accessible to women and other members of their households. Food security is the ability of individuals or household to have access to adequate quantities and qualities of food needed for an active and healthy life at all times (WFP, 2012; Quaye, 2008). It has also been reported that the non-availability of a variety of nutritious foods and high costs of healthy foods constitute major barriers to women accessing optimal diets (Farahmand et al., 2012).

In Ghana, women contribute to all aspects of food security: food availability, accessibility and utilization. Women constitute 47% of the agricultural labour force and account for about 70% of the total crop production in the country (Mohammed, Solikua, & Mansega, 2013). Women are involved in the various aspects of the food system including the production and acquisition of food as well as post- harvest activities such as processing, preservation, distribution and consumption (Braimah et al., 2014;

Mohammed et al., 2013 ; Boakye-Achampong, Mensah, Aidoo, & Osei-Agyemang, 2012; Kuhnlein & Pelto, 2009). It is usually women who grow the majority of family foods including fruits and vegetables and take the decisions on which foods to buy for feeding the family when their farm produce gets used up (United Nations, 1990). In spite of their immense contributions to all aspects of food security, women tend to be more under-nourished than their husbands and other male relatives (Zereyesus et al., 2014; Boakye-Achampong et al., 2012).

On the average, while 5% of the population of Ghana is estimated to be food insecure, the prevalence rate in the three northern regions is estimated to be 35%. (Zereyesus et al., 2014; Boakye-Achampong et al., 2012). Saaka investigated the relationship between food insecurity and pregnant women's nutritional status in northern Ghana and reported that as many as 60% of households were worried about not having enough food to eat and a similar proportion reported having limited varieties of food owing to lack of money to buy food. The study also found 28% of WRA to be under-weight - a percentage far higher than the 12% in the 2014 GDHS Report (Saaka et al., 2017).

2.4 Interventions addressing challenges to women's dietary practices

In order to achieve positive dietary outcomes, interventions need to consider cultural and contextual factors affecting dietary intake. (Kong, Tussing-Humphreys, Odoms-Young, Stolly, & Fitzgibbon, 2014; Sliwa et al., 2011). Nutrition education programmes are designed to facilitate voluntary adoption of food choices and other food and nutrition-related behaviour conducive to health and well-being (Dunneram & Jeewon, 2015). Nutrition education has been considered a priority and an important pathway for improving dietary behaviour of populations through behavioural change communication

strategies. Nutrition education has a strong influence on people's knowledge, attitudes and perceptions (Contenta, 2008).

Effective nutrition education should be based on appropriate theory and evidence (Contenta, 2008). Most theories that are used in nutrition education are drawn from the field of social psychology and health behaviour models, which concentrate on the importance of people's cognition, motivations, values and perceptions about the world as well as take into consideration people's cultural and physical environments, both of which influence their behaviours and practices. Nutrition education can take place at varied settings including the community and health facility levels.

The effects of health and nutrition education on women's post-partum beliefs and practices were investigated in China by using a randomized controlled trial (Liu et al., 2009). The strategies for the intervention included face-to-face contacts between the health workers and post-partum women and a health education guidebook. The outcome of the intervention showed that participants in the intervention groups showed significantly higher levels of improvements in overall dietary behaviour than participants in the control groups. The outcomes that were observed in the study included the consumption of fruits and vegetables, soya bean and soya products. Significantly more women in the intervention groups stopped adhering to traditional food taboos. Other effects of the intervention included lower scopes of constipation, fewer leg-cramps or joint pains and prolonged lochia rubra among participants in the intervention against the control groups. They concluded that, to have a greater impact on the target audience, intervention strategies must include television programmes, magazines and the internet.

Community-based participatory dietary interventions are among the means by which women have been reached with dietary interventions. Community-based participatory research promotes the participation of members of communities in controlling and influencing decisions and actions that affect their communities (Savin-Baden & Major, 2013b). In this instance, the research partners respond to community needs and the environment including culture rather than impose predetermined ideas of what will work best for the researched community (Sloane et al., 2003).

In the past, the use of community participation in implementing health interventions has been minimal (Moore et al., 2015). As a result, outcomes of interventions were not very encouraging (Kpormegbe and Ahorlu, 2014). Recent recognition of the effectiveness of community-based participation in facilitating positive outcomes in interventions led to the use of the approach in implementing health-related interventions (Kpormegbe & Ahorlu, 2014b).

In a systematic review of literature on healthy diets and nutrition education among WRA, Dunneram and Jeewon (2015) emphasized the importance of dietary interventions at community levels in encouraging the adoption of healthy dietary practices and improving WRA's health at the family and community levels. The authors reviewed a cross section of nutrition and dietary interventions among WRA and came to the conclusion that community-based interventions using multiple strategies had proven to be useful for improved behaviour modifications among women. Additionally, gathering of women to share nutrition information in community-based intervention had proven to be effective in improving women's dietary knowledge and practices.

In a similar community-based intervention in Mali, Bonde (2016) introduced an intervention consisting of giving livestock to vulnerable households with children under two years of age and training recipients on the care of the animals as well as the preservation, drying and storage of crops. Education on nutrition and hygiene as well as detection of child mal-nourishment was provided. The channels for communication included radio broadcasts and food demonstration sessions using community health agents. Results of the intervention showed that there was general improvement in the scopes of access to food in the intervention community. On children's dietary diversity, the assessment recorded an increase from 3.9 food groups to 4.4 (from 9 groups) at the post-intervention stage. Similarly, the proportion of women with low dietary diversity scores decreased from 46% at baseline to 26% at post-intervention (Bonde, 2016).

Recourse to sustained education with the view of improving the dietary status of pregnant women and lactating mothers has been suggested (Oluwafolahan, Catherine, & Olubukunola, 2014; Hailelassie et al., 2013). Hailelassie et al. (2013) went on to specify increased intake of food, proper dietary practices and dietary diversification during lactation as the main topics for nutrition interventions. Ersino et al. (2017) supported the need for prolonged community-based intervention activities involving monthly interactive community meetings and home-visits. Ersino et al. opined that such interventions could enhance the dietary diversity scores (DDS) in both mothers and their children and also reduce the scopes of mal-nutrition among children. The opinions of Ersino et al. derived from the outcomes of their six-month randomized controlled nutrition education intervention on the intake of pulse and other foods among 200 mother-child pairs (children less than five years old) in two purposively-selected communities in the pulse-growing region of Halaba in south Ethiopia. The channels for

delivering the intervention consisted of interactive monthly community meetings and home-visits.

Data was collected on variables such as socio-demographic characteristics, knowledge, attitudes and practices related to food, dietary information, DDS and anthropometric information at both baseline and endline. Additionally, focus group discussions with local farmers were used. Outcomes among participants in only the intervention community were more favourable and included improved knowledge, attitudes, practices and perceptions of the benefits of pulse nutrition among mothers. Other benefits were DDS and consumption of pulse and animal-source foods by both mothers and children and mean body-mass index- for-age (BMI for-age). Furthermore, farmers in the FGDs were said to have indicated their willingness to increase their production of pulse as well as allocate more quantities for home consumption (Ersino, Henry, & Zello, 2017).

2.4.1 Interventions addressing challenges to women's dietary practices in Ghana

Interventions addressing challenges to women's nutrition including women's dietary needs in Ghana include micronutrient supplementation, behaviour change communication (BCC), food supplementation with nutrition education in the three northern regions, food-based strategies and improving healthcare services for women (GOG, 2013; FAO, 2009; Lartey, 2008). Furthermore, the government of Ghana in collaboration with the USAID has been implementing Ghana's Feed the Future Initiative with focus on the three northern regions owing to their higher scopes of food insecurity and levels of poverty (Zereyesus et al., 2014).

The effectiveness of community-based interventions in improving women's dietary and nutritional status has been emphasized in other studies (Otoo and Adam 2016; Tchum et al. 2009; Colecraft et al. 2012). In Gomaa-East District of Central Region of Ghana, a ten-week randomized controlled trial was conducted to assess the impact of nutrition education on HB levels, nutrition knowledge and dietary intake of pregnant women (Otoo & Adam, 2016). The content of the intervention included the consumption of iron-rich foods, vitamin C-rich foods, grains, root and tubers, legumes and red meat by women.

The education sessions were carried out on individual basis through bi-weekly home-visits and bi-weekly phone calls to the participants who were recruited from four ante-natal clinics. Participants in the intervention group achieved significant increases in both mean knowledge on anaemia and iron-rich foods and HB concentrations over those in the control groups. Intakes of red meat, legumes, grains, roots and tubers and vitamin C –rich foods were also significantly higher for participants in the intervention group than those in the control group. There was, however, no significant difference in the change in weight between participants from the two groups.

Tchum et al (2009) conducted a three-month community-based randomized controlled trial involving post-partum mothers in Ejisu-Juaben District of Ashanti Region to assess the effects of the consumption of African egg-plant leaves on post-partum Ghanaian mothers' vitamin A status. The intervention included daily supplies of 200grams of African egg-plant leaves for only participants in the intervention groups for 3 months. Results of the intervention indicated a significant improvement in the vitamin A status of participants in the intervention group. Tchum et al. suggested that dietary modification

and nutrition education to WRA should include natural and locally-available food sources rich in pro-vitamin A. They justified their suggestion with the claim that indigenous leafy vegetables could be easily cultivated locally thereby enhancing their sustainability and affordability in comparison with periodic oral dosing with vitamin A (Tchum et al., 2009).

Even though both interventions focused on improving WRA's dietary quality, community-based randomised control trials were employed in both studies without active participation of community members in the design and implementation processes. In addition, quantitative methods were used in the studies without recourse to qualitative assessment of the process to address implementation bottlenecks and to understand participants' views of the interventions. These limitations notwithstanding, the outcomes of both studies were positive: improvements in the quality of WRA's diets.

2.5 Qualitative Research

Different researchers hold various views about the nature of reality (ontology) and the nature of knowledge (epistemology) but for the qualitative researcher, research is inherently subjective (Savin-Baden & Major, 2013a; Creswell, 2009). The subjective view about research stems from the ways qualitative research is carried out. First, qualitative research occurs in the participants' natural setting and aims at getting researchers to understand social phenomena from the perspective of the researched - that is, the "emic" perspective. In this case, the researcher does not aim at analyzing relationships between variables in order to determine cause and effect but rather to understand the phenomena from the various accounts given by the participants in the study. Related to this characteristic is the belief that people may have different

perceptions of reality - thus, attributing meanings and concepts to such perspectives, which is what the researcher tries to understand. Second, owing to the emic perspective of qualitative research, the study participants become an integral part of the study. Some researchers may even engage the study participants as co-researchers to some degree in the research process especially in the case of most participatory action researches (Savin-Baden & Major, 2013a).

The issue of subjectivity is related to the position of the researcher in shaping the nature of the research process and vice-versa. In this regard, the researcher decides on what should be the inclusion and exclusion criteria in the research process, what kinds of questions should be asked and how the results are to be interpreted. The qualitative researcher, therefore, believes that research cannot be value-free so there is the need for the researchers to state their positions and biases and how these influenced the research process (Tong, Sainbury, & Craig, 2007).

Qualitative research assumes the existence of a world that is constantly changing as a result of changes in the social, political, economic and cultural influences (Loewenson, Laurell, Hogstedt, D'Ambruoso, & Shroff, 2014; Savin-Baden & Major, 2013a). People may, hence, have different views of reality at different points in time. Researchers using this approach have the option to choose from a range of strategies such as ethnography, grounded theory, case studies and phenomenology (Creswell, 2007). A review of these methods indicates that even though the different methods have specific foci based on their research questions, they all have one common feature – namely, understanding the phenomenon under study from the participants' perspective. Within any of these methods, the qualitative researcher could employ naturalistic observations, semi-

structured or unstructured interviews, case studies and focus group discussions in collecting and analysing data (Loewenson et al., 2014). Considering the foci of the current study, which were the cultural and social issues pertaining to women's dietary practices; ethnography was deemed the most suitable method.

2.5.1 Ethnography

Ethnography is an aspect of anthropology which seeks to understand other cultures (Savin-Baden & Major, 2013a). Early anthropologists used ethnography to explore, understand and tell indigenous people's stories. Even though ethnography has gone through several developmental phases, it has come to be understood as the study of people, their cultures and values and it also attempts to create an understanding of the people being studied. What counts as an ethnographic study is the intensive fieldwork in order to gain detailed accounts and insight of the group being studied.

Specifically, ethnographic researchers focus on the everyday life of the people being studied, spend time with the group being studied, use participant observation as a primary tool for gathering data together with in-depth unstructured tool of data collection and, finally, present findings from the participants' points of view. Ethnographic research could span months and years in a cultural setting trying to understand the people's ways of life involving an intensive and detailed process of data collection (Savin-Baden & Major, 2013b).

Ethnography was an appropriate choice for this study because it sought to understand cultural norms, knowledge and perceptions of the study communities and their influences on women's dietary practices by using different tools of data collection. The tools

included community and household observations, key informant interviews, in-depth interviews, focus group discussions and qualitative 24-hour recall.

2.5.2 Participatory Action Research (PAR)

Savin-Baden and Major (2013) defined PAR as a method of intervention, development and change that is carried out in communities or among groups in which issues affecting them are systematically examined from their point of view. According to Savin-Baden and Major, PAR is both a research design and a philosophical world-view, which seeks to empower communities to become more aware of their constraints by getting researchers to work with the people as opposed to imposing ideas on them. Using PAR enables researchers to generate information or knowledge to inform an action (intervention). Loewenson et al. (2014) supported the view by Savin-Baden and Major (2013) about PAR by defining it as a research design that seeks to understand and improve communities by involving the collective action of those affected by the research problem to produce desired change as a means of generating new knowledge. In their view, researchers interpret participatory action research differently and apply it to different research approaches.

2.5.3 Qualitative evaluation of interventions

While most randomized control trials may not provide information on how an intervention may be replicated in a similar context to produce similar results (Kpormegbe & Ahorlu, 2014a), qualitative evaluations of interventions are able to fill this gap by providing useful information regarding the intervention process, participants' experiences and reactions to the intervention as well as components of the intervention

that either worked or did not work (Bell & Aggleton, 2016; Fonteyna & Bauer-Wub, 2005; Patton, 2002).

A process evaluation is a form of qualitative assessment of a programme or an intervention, which involves reporting on how the programme was implemented either in place of or in addition to assessing its outputs and outcomes (Patton, 2002). Process evaluation is recommended as a tool for assessing the following three issues pertaining to an intervention: first, fidelity and quality of implementation (whether the intervention was delivered as intended); second, clarification of causal mechanisms and, third, identification of contextual factors that may account for variations in the outcomes (Moore et al., 2015).

Patton (2002) argued that some styles or approaches to community development operate on the premise that “what we do is as important as **how** we do it”- that is, actively involving people in the development process is an essential outcome in itself and not merely a means to achieving some other outcomes. In other words, the process or journey rather than just the destination is what matters in undertaking a process evaluation of any intervention. In Patton’s view, the level of community participation and involvement in carrying out an intervention, for instance, is critical for building a better relationship and mutual understanding along the intervention process. “The process, in this case, then becomes the outcome since the production of a plan or actual intended outcome becomes the means to building the relationship with the community” (Patton, 2002; pp. 159). Unfortunately, most interventions emphasize intervention outcomes at the expense of the process because they claim that the outcomes are more important (Moore et al. 2015). Patton, however, reiterated that the process-outcome

relationship must be the driving force in all evaluations of interventions. Process evaluation is, therefore, an essential aspect of designing and evaluating interventions to assess their impacts or expected outcomes.

Moore et al. (2015) claimed that there were two ways by which the outcome of an intervention could be affected: first, the design of the intervention and, second, how the intervention was implemented. The authors added that in some instances, however, an intervention could still achieve high impact even when it was not fully delivered. To fully understand what actually worked in an intervention, therefore, required a full description of the processes of implementing it as against looking at its expected outcomes. The authors argued that in process evaluation, a clear description of the intervention is key to understanding the outcomes of implementation. They, therefore, proposed a framework with three main components for conducting and reporting process evaluation studies: the implementation process, mechanism of impact and effect of context on outcome. The framework is in line with the Medical Research Council (MRC) guidelines for conducting process evaluations (Moore et al., 2015).

Process evaluation describes into detail the implementation of an intervention using qualitative inquiry (Patton, 2002). Patton contended that depicting the intervention process demands detailed descriptions of the following issues: first, how people engaged with one another during the implementation; second, verbatim narratives of different participants' experiences encountered and, third, participants' perceptions of the intervention. Furthermore, process evaluation does not involve assessing only formal or planned activities and anticipated outcomes but also informal patterns and unanticipated outcomes and how these were mitigated to facilitate change. Reporting these occurrences

permits judgments to be made regarding the extent to which the intervention was implemented, the way it was initially planned to operate, which components of the intervention worked best and which needed improvements.

Formative evaluation, which aims at improving components of interventions as they are being rolled out to improve subsequent components, is encouraged rather than summative evaluation in some evaluation researches. Qualitative or process evaluations have been approached differently depending on the nature of the intervention (Allison et al., 2017; Eaves et al., 2017; Russ et al., 2014; Fonteyna & Bauer-Wub, 2005; Ducharma & Trudeau, 2002). Even though these qualitative evaluations were done on the basis of fidelity of intervention, participants' general impressions, benefits and suggestions for improvements in future interventions, they did not incorporate comparison groups in their studies. Additionally, all except one study did not collect pre-intervention data.

2.5.4 Analysis of qualitative data

A number of data analysis methods exist for qualitative data inquiry. They include grounded theory, discourse analysis, interaction analysis, conversational analysis, content analysis, framework analysis and thematic analysis. Six steps have been proposed for analyzing qualitative data thematically (Braun & Clarke, 2006). These steps are familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and, finally, producing the report.

The first step, familiarization with the data, involves exploring the data extensively by reading and rereading thoroughly through the transcripts and listening to the recorded interviews to reconcile them with the transcripts, thereby ensuring validity of the latter.

Rereading the transcripts, studying field notes and listening to the tapes further enable the researcher to take note of words, phrases and expressions frequently emerging from the participants' responses. After being familiar with the stories told by the various transcripts, all noted expressions, phrases and words identified in them which appeared interesting and meaningful are coded systematically across the entire data set. Verbatim responses (or cases) are then collated and assigned to each code. These codes, even though numerous, provide some indications of the contexts of the stories told in the various transcripts and field notes.

The third step involves searching for themes. Themes are concepts including ideas, issues and behaviours emerging from the transcripts. Braun and Clarke (2006) described a theme as a subject that "captures something important about the data in relation to the research questions and represents some level of patterned responses or meanings within the data set" All the coded responses are collated into potential themes and all relevant data pertaining to each potential theme are brought together as main themes and sub-themes. The fourth step comprises a deeper review of the initial themes and sub-themes. In this regard, identified themes that appear similar are combined while others are considered sub-themes. In the fifth step, each of the identified major themes is given a concise and contextual working definition. This exercise enables the story from the data to be told by the emerging themes (Braun and Clarke, 2006). The final step involves producing the report on the basis of the themes and sub-themes identified in the fifth step.

Analysis of dietary quality

In low-income countries, nutrient adequacy is measured using dietary diversity as a proxy. This approach is advantageous because it is less costly and less cumbersome compared to others methods such as proportionality (more of some food groups and less of others) and moderation in consuming certain foods perceived to be risk factors for diseases (Workicho et al., 2016). A higher dietary diversity score is associated with increased nutrient intake and improved nutritional status (Workicho et al. 2016). Both qualitative and quantitative methods exist for analyzing and interpreting dietary data. The qualitative methods include interpreting dietary data based on the number of food servings compared to requirements by using food pyramids and the use of dietary diversity scores. In the FAO (2011) guidelines for measuring household and individual dietary diversity, Women's Dietary Diversity Score (WDDS) has been designed specially to assess the nutritive quality and micronutrient adequacy of women's diets.

Dietary diversity has been operationalized in several ways such as the total of food groups consumed across a specific period of time. For many years, a number of organizations, including the FAO, have been using results based on a 9-point food-group system as indicators for the quality of women's diets. WDD score is calculated by using a count of nine food groups consumed over a 24-hour period. The WDDS has been categorized into three. The first category, low-dietary diversity, indicates that a woman consumes foods from three or less out of the nine groups. Middle-dietary diversity shows that a woman consumes foods from four to five different groups. Last, high-dietary diversity means foods from six groups upwards are consumed (Zereyesus et al., 2014; FAO, 2011).

More recently, however, the need for a simple dietary indicator that can be expressed in terms of either meeting or not meeting a minimal diversity score has led to the development of a Minimum Dietary Diversity – Women (MDD-W) (Martin-Prevel et al., 2017). The MDD-W is a dichotomous indicator used to state whether or not a woman consumed foods from at least five out of ten groups the previous day. The proportion of women achieving this minimum score is used as a proxy indicator for high micronutrient adequacy (an important dimension of dietary quality) (Martin-Prevel et al., 2017; FAO, 2011).

Using ten food groups as against nine used by the FAO (2011), the MDD-W proposes a cut-off point of 5 food groups as the minimum number of food groups required to meet one's daily requirement of nutrients so that the consumption of foods belonging to less than 5 groups suggests inadequacy of nutrient intake. The MDD-W was more appropriate for this study because it is simpler (easier to understand and construct). It also gives a quicker indication of the proportion of women meeting their requirements of nutrients in a population. A comparative break-down of foods belonging to the nine and ten food groups proposed by the FAO (2011) and FAO and FHI 360 (2016) respectively, for assessing women's dietary diversity scores is shown in Table 2.1.

Table 2.1: Comparative schedule of the Nine and Ten food group classifications

FAO (2011)		FAO and FHI 360 (2016)	
Food Group	Individual foods	Food groups	Individual foods
1. Starchy staples	Cereals such as corn, maize, rice, sorghum and millet and foods made from any of these White roots and tubers such as white potato, white yam and cassava and foods made from any of these	1. Starchy staples	Cereals such as corn, maize and rice, sorghum and millet and foods made from any of these White roots and tubers such as white potato, white yam and cassava and foods made from any of these
2. Dark green leafy vegetables	Dark green leafy vegetables including wild fruits, vitamin A- rich leaves such as cassava leaf, kontomire and amaranth	2. Dark green leafy vegetables	Dark green leafy vegetables including wild fruits, vitamin A- rich leaves such as cassava leaf, kontomire and amaranth,
3. Other vitamin A- rich fruits and vegetables	Vitamin A-rich fruits such as ripe mango, apricot, pawpaw and dried peach and 100% fruit juices made from these fruits	3. Other vitamin A- rich fruits and vegetables	Vitamin A-rich fruits such as ripe mango, apricot, pawpaw and dried peach and 100% fruit juices made from these fruits
4. Other fruits and vegetables	Tomato, onion, egg-plant and other locally-available vegetables, wild fruits and 100% fruit juices	4. Other fruits	Wild fruits and 100% fruit juices
		5. Other vegetables	Tomato, onion, egg-plant and other locally-available vegetables
5. Organ meat	Liver, kidney, heart, any organ meat, blood-based foods	6. Meat, poultry and fish	Liver, kidney, heart, any organ meat, blood-based foods, chicken, beef, mutton, lamb, fish, anchovies
6. Meat and fish	Beef, pork, lamb, goat, rabbit, game, insects or any other bird	7. Pulses (beans, peas and lentils)	Dried beans, dried pea, lentil,
7. Eggs	Eggs from chicken, duck, guinea-fowl or any other egg	8. Egg	Eggs from chicken, duck, guinea-fowl or any other egg
8. Legumes and nuts	Dried beans, dried pea, lentil nuts, seeds or foods made from these- e.g. peanut butter and hummus	9. Nuts and seeds	Nut, seeds or foods made from these -e.g. peanut butter, hummus
9. Milk and milk products	Milk, cheese, yogurt or other milk products	10. Dairy	Milk, cheese, yogurt or other milk products

Source: FAO, (2010), Zereyesus et al. (2014) and FAO and FHI 360 (2016)

The content of the two approved categorizations of food groups are similar; however, while the 9-food group approach combined a number of foods in one group (in the case of legumes, seeds and nuts and other vegetables and fruits), the ten-food group approach separated them into nuts/seeds; bean/pea/lentil; other vegetables and other fruits). In the case of animal-source foods, the 9-food groups approach separated organ meat from meat and fish, while the ten-food groups approach combined all three animal-source proteins in one group.

2.6 Behaviour change communication (BCC) interventions

One of the widely used promotional strategies in health- and nutrition-related interventions is BCC (Tull, 2017). BCC is a process of working with individuals and communalities or groups to develop communication activities to enhance the promotion of positive or beneficial health-related behaviour patterns and to create a supportive environment for sustaining the new behaviour (Tull, 2017).

Human behaviours, including sub-optimal dietary behaviour or practices, are complex (USAID, 2017) but play an important role in many of the leading causes of morbidity and mortality such as malnutrition (both under-and over-nutrition) and its implications for cardiovascular diseases globally (Davis, Cambell, Hildon, Hobbs, & Susan, 2014). The complexity of human behaviour is partly the result of social norms guiding human actions or inactions, access to resources, self-efficacy, habit and structural weaknesses and opportunities (USAID, 2017). Altering such behaviour, no matter how little, could have some appreciable impact on the health outcomes of a population (Davis et al., 2014). Investments in undertaking behaviour change interventions to address some of these behavioural lapses has, unfortunately, been relatively small even though the

evidence shows their in improving the health outcomes of individuals, families and communities at large (Davis et al., 2014).

Recent discourse in health- and nutrition-related interventions using behaviour change techniques has shown a shift from the use of the concept “behaviour change communication” (BCC) to “social behavior change communication” (SBCC) (Tull, 2017). The evidence suggests that the shift in terminology from BCC to SBCC is necessary to reflect current emphasis place on improving health outcomes through individual and community behaviour where the social context of behaviour as well as the systems and processes influencing behaviours are identified and strengthened. Social-behaviour change communication (SBCC) intervention is, therefore, understand as a set of interventions or strategies made up of elements of inter-personal communication, social change and community mobilization activities, mass media and advocacy to support individuals, families and communities in adopting and maintaining behaviour that has positive health outcomes. In some cases, the concepts of BCC and SBCC are used interchangeably depending on the focus of the intervention (USAID, 2017)

The main principles underlying SBCC are that individuals do not act in isolation but in the context of families and communities. Peoples’ behaviours are guided by the social and physical environments in which they find themselves; therefore, designing interventions that address these external factors stand a better chance of making more impact than focusing only on the individual (USAID, 2017). A second consideration in SBCC is the notion that to adopt and maintain a new behaviour requires information and the skills necessary for such behaviour change to occur. Individuals may need access to resources, motivation, encouragement, self-efficacy and, perhaps, support to act. In some

cases, a diversion in some of the social norms guiding behaviour may be needed (USAID, 2017).

In nutrition-related SBCC, some dietary practices may be habitual and, therefore, the need to disrupt certain habits may become inevitable in achieving positive dietary behaviour. There is, however, evidence to show that individuals are more likely to adopt a new behaviour if it does not deprive them of their group identity (USAID, 2017). Last, but not least, SBCC interventions need to be targeted for specific population groups for the desired impacts to be realized. This need partly rises because different population groups may have different perspectives of an issue and their concerns need to be built into the design of the intervention for these differences to be addressed (USAID, 2017).

The effectiveness of social behaviour change interventions in addressing maternal and child nutrition- and health-related issues has been reported through a rapid review of literature in a number of socially-conservative settings where beliefs and traditions are entrenched and influence health behaviour outcomes (Tull, 2017). The review gives examples of the use of SBCC in maternal, infant and young child nutrition in predominantly Muslim settings where community-based participatory approaches were employed as part of the process of changing behaviour and improving health outcomes of children and mothers.

Unfortunately, the body of evidence on the effectiveness of SBCC in improving women's dietary practices is limited even though the indication is that SBCC could be successful in improving the uptake of behaviour that is being promoted (Tull, 2017). The review concluded among other things that, depending on the social context of a

particular behaviour of interest, the involvement of religious or traditional leaders, teachers, female associations or health professions among others are crucial in the successful implementation of a SBCC intervention that would bridge the gap between knowledge and practice.

A number of behaviour change theories or models have been propounded by behavioural scientists in guiding interventionists aimed at addressing individual and social problems affecting health outcomes (Davis et al., 2014; Glanz et al., 2008). The application of behaviour change theories is encouraged as part of the process of an intervention design and evaluation in addressing public health related issues (Davis et al., 2014). This is important for a number of reasons including identifying the antecedents of behaviour and the causal determinants of change is important for appropriate targeting of interventions and testing the effectiveness of the theory and possibly, the development of more effective ones.

In a scoping review, Davis et al., (2014) identified eighty-two different kinds of behaviour change theories. While some of these theories are more appropriate for changing individual level behaviour, others are more focused on group or inter-personal behaviour. The health belief model by Rosenstock (1966); theory of planned behaviour/Reasoned action by Ajzen (1985); transtheoretical/stages of change model by Prochaska (1983) are examples of theories focusing on individual behavior while the social cognitive theory and the social ecological model of behaviour are a few examples of theories that focus on group behaviour. The most commonly used theories being the transtheoretical/stages of change, theory of planned/reasoned action and the social cognitive theories (Davis et al., 2014).

2.6.1 Social cognitive theory

The social cognitive theory (Bandura, 1997) proposes that behaviour is influenced by personal, social and environmental factors. The personal factors relate to one's cognition such as knowledge, awareness, attitudes and self-efficacy or agency. The lack of self-efficacy or agency can be a strong barrier to behavioural change. An appropriate communication strategy can, however, help increase the individual's and community's sense of agency in a number of ways: by helping to teach relevant skills, providing clear instructions that make a particular behaviour look achievable and, last, by using examples to show how others have been able to accomplish a similar behaviour.

The social factors, on the other hand, relate to social norms or group rules that determine what is deemed acceptable behaviour in the community. Social norms include people's beliefs, values and behaviour. For instance, social norms can influence one's thoughts and behaviour in a situation in which one is unsure of how to act and looks up to others for social approval on how to behave. Failure to act in accordance with social norms may result in social exclusion from the group.

The third factor that influences behaviour, according to the social cognitive theory, is the physical environment in which one finds oneself. These physical environmental factors include access to resources, economy, technology and the legal system that will enable the new behaviour being promoted to be possible (McAlister et al., 2008). For instance, in promoting the consumption of certain food items, one should be certain that the community in which they are being promoted should have access to them.

The social cognitive theory proposes a number of assumptions for an effective behaviour change intervention. First, there should be provision of information to increase people's awareness and understanding of the risks involved with the unhealthy behaviour one wishes to change and the creation of an atmosphere in which people are convinced they have the ability to change such behaviour. Second, there should be development of the skills needed to translate the acquired knowledge into positive behaviour - thus, increasing people's level of self-efficacy to practise the positive behaviour. The last assumption is the creation of a social support system to facilitate and sustain the newly-adopted behaviour by adopting participatory approaches through collective efficacy, in which people are allowed to play active roles in the change process (McAlister et al., 2008). Dietary interventions are, therefore, likely to have greater impacts if these concepts underpin them.

2.6.2 Community Readiness Model (CRM)

To make communities more effective partners in intervention activities –that is, to facilitate effective community participation –the community readiness model was designed by a group of researchers of the Tri- Ethnic Centre for Prevention Research (Edwards et al., 2000). Community readiness is the extent to which a community is ready and willing to take action on issues affecting its members. Community readiness has been defined as “the observable and psychological characteristics of a community that influence its ability to initiate change, including, but not limited to, organizational resources and the capacity and attitudes of the community” (Stanley, 2014; Sliwa et al., 2011; Findholt, 2007; Edwards et al., 2000). The concept is synonymous with community agency – that is, the ability of a community to take action on a specific issue (Giddens, 1993). The Tri-Ethnic Centre for Prevention Research initiated this concept to

plan preventive ways of dealing with community problems since all communities varied in their ability to implement and sustain interventions. Using the approach could help to place communities at their appropriate stages of readiness for more effective intervention programmes.

The CRM is based on four main premises: first, community readiness is issue-specific - implying a community could be at different levels or stages of readiness for different community issues; second, the stage of readiness in a community regarding any community issue can be accurately assessed to determine the local capacity or otherwise to carry out an effective intervention; third, it is possible to increase a community's readiness by increasing community knowledge and awareness of the issue and, last, determining a community's stage of readiness for an intervention is important since it is a determining factor for moving the community from one stage of development to another (Stanley, 2014; Findholt, 2007).

Community readiness is measured on five dimensions: **a)** community knowledge about the issue, **b)** community knowledge about existing efforts to address the issue, **c)** community climate regarding the issue, **d)** community leadership position on the issue and, finally, **e)** community resources to address the issue (Kostadinov et al., 2015; Stanley, 2014; Sliwa et al., 2011; Edwards et al., 2000). Thus, the model measures community knowledge, attitudes, efforts and resources in order to assess the level of readiness to effectively carry out an intervention.

The model is based on a number of theories with the most notable being the trans-theoretical theory of change formulated by Pochaska and Diclemente- also known as the

stages of change theory - and the social action theory formulated by Warren (1978) (Edwards et al., 2000; Warren, 1978). The Tri-Ethnic group of researchers incorporated the principles of these theories into the community readiness model because, unlike individuals, communities are more complex in their processes of change and finally came out with 9 stages of change/readiness at which communities may find themselves at any point in time. The nine stages of readiness and their definitions are as follows:

Table 2.2: Description of the nine stages of community readiness

	Stage of readiness	Description
1	No awareness	At this stage of readiness, community members or leaders do not generally recognise the issue as a problem and may actually see it as part of their everyday life.
2	Denial	Some community members, particularly some leaders, may recognize the issue as a problem but majority of community members may not and, therefore, they do not see the need to address it.
3	Vague awareness	There is a general feeling among some members of the community about the issue being a problem that needs to be addressed, but they are doing nothing to address it.
4	Preplanning	There is a clear recognition of the need to do something about the problem but nothing is being planned to address it.
5	Preparation	Community planning is underway to address the problem and there are modest community efforts to address it.
6	Initiation	There are some activities underway to solve the problem; leaders may be actively involved but community members may not be involved in addressing the problem.
7	Stabilization	A programme or two may be in place in the community and supported by community leaders to address the issue.
8	Confirmation or expansion	There are policies and activities to address issue and community leaders and members lend their full support to seeing the programme through. Progress has been evaluated and lessons learnt incorporated into new programmes.
9	Professionalization or community ownership	There is detailed knowledge of problem; its prevalence, causes and consequences are well understood by entire community. Programmes are in place for either the entire community or targeted at specific groups of people. Community involvement is high and leadership completely supportive. There are also periodic evaluation processes to guide new programmes. Community ownership is high and community is held responsible for programmes aimed at addressing the problem.

Source: Adapted from Findholt (2007), Edwards et al. (2000) and Plested et al. (2004)

Depending on the stage of readiness in which a community finds itself, different strategies are proposed for making an intervention more focused in addressing the issue. For instance, for the first 4 stages of community readiness, creation of awareness about the nature, causes and consequences of the problem as well as the need for the community to do something about the problem are key among the intervention activities.

The proponents of the CRM tested it in different settings with different focuses including drug and alcohol abuse, HIV/AIDS, child abuse, obesity and nutrition (Findholt, 2007; Edwards et al., 2000). Sliwa et al. (2011) used the model to select communities for an obesity prevention programme in eight cities in the USA. The results showed that overall readiness scores based on the five dimensions ranged from 2.97 to 5.36 on the nine-point scale. The mean readiness score of 4.28 represented a preplanning stage of readiness. Recently, Pradeillis et al. (2016) applied the model in exploring the potential of using a faith-based organization as community agents for preventing over-weight and obesity among adolescents in South Africa.

So far, the CRM has been extensively used in the USA but few studies in Canada and Australia have used it in issues related to drugs and obesity. By the end of December 2016, only two studies from Africa had reported the use of the model in South Africa (Pradeillis et al., 2016) and Liberia (Kennedy, Johnson, & Alberto, 2004) with focus on adolescent weight management and HIV/AIDS respectively. Before the current study there was no evidence of the model being used in Ghana to help in the designing and implementation of nutrition-related interventions.

2.6.3 Principles of adult learning

The principles of adult learning are relevant in community-based interventions. Previously, assumptions on which adult learning were based was called pedagogy - a Greek version of “child-learning”. Later, the realization of the ineffectiveness of the application of pedagogy to adult learning led to the development of andragogy – a Greek version of “man-learning”. Andragogy, which was first used by a German educator called Alexandra Kapp in 1833, might be defined as the art and science of helping adults to learn or any form of adult learning (Kearsley, 2010).

Malcolm Shepherd Knowles (1984) popularized andragogy and made a set of four assumptions about adult learning. Knowles’ first assumption is that, as one becomes an adult and matures, one becomes self-dependent and has a sense of self-directedness and expects society to perceive one as such. The second assumption is that as a person matures, he or she accumulates a rich reservoir of experiences that facilitates learning but failure to utilize an adult’s experiences creates a feeling of dejection or being insulted. Third, as a person matures, his or her readiness to learn becomes increasingly oriented to the developmental tasks of his or her social roles. This assumption implies that the adult educator should adopt a problem-solving rather than a subject-matter orientation to learning – for example, emphasis should be placed on the functional characteristics of topics in regard to participants’ occupations. Knowles’ last assumption is that as a person matures, the motivation to learn becomes internal rather than external. The implication of this assumption for adult learning is that the adult educator should motivate the learners with things that are relevant to them.

In addition to his four assumptions, Knowles encouraged adult instructors to consider four main principles when leading adults in learning. First, adults should be involved in the planning and evaluation of their learning exercises; second, experiential learning should form the basis for the learning activities; third, subjects should have immediate relevance to and effects on their personal lives and, finally, adult learning should be problem centred rather than content centred (Knowles, 1984).

Knowles' adult-learning principles have been adopted in nutrition education (Lieb, 1991). The author observed that to be an effective adult educator, one needs to understand the manner in which adults learn best. Since interventions target a wide range of individuals including adults, there is the need for interventionists to understand that adult learning is very different from child learning. The assumptions proposed by Knowles should, thus, not be overlooked in nutrition education and communication. Creating a comfortable environment for adult learners, valuing their rich experiences, encouraging participation and guiding them through the discussions rather than adopting the "student-lecturer" kind of relationship will enhance the effectiveness of nutrition interventions. To facilitate adult learning, the use of visual, audio and tactile aids has been suggested.

2.7 Gaps in the reviewed literature

Even though a number of socio-cultural barriers have been identified as factors for WRS's poor dietary practices and quality in Ghana, the review indicated few community-based participatory interventions addressing these barriers. The review of literature showed that there were many nutrition- and dietary-related interventions in communities with health facilities as well as in those where access to health facilities

was a great challenge. These interventions, however, concentrated on the immediate factors for poor diets such as inadequate knowledge on nutrition among members of communities at the expense of the need to address socio-cultural barriers such as women's poor access to household food resources, pro-men preferential food allocation system and food taboos and restrictions pertaining to WRA.

The interventions also failed to provide advocacy on the importance of women's diets to the development of their children and the community at large. This study, therefore, sought to fill this gap by using a community-based participatory action approach to identify and address the socio-cultural barriers to women's diets in a rural community called Yilkpene. The study was guided by the social cognitive theory and the community readiness model was used to assess Yilkpene's level of readiness to implement an attitudinal and behavioural change communication intervention for addressing the identified socio-cultural barriers to women's diets.

CHAPTER THREE

3.0 METHODS

This chapter presents details of the study location, design and process, methods of data collection, sampling of participant categories, data recording, management and analysis and themes. Monitoring of the intervention activities, quality control as well as ethical considerations are also presented.

3.1. Study location

Yilkpene and Kpachilo were the two locations for this study. Both communities belong to Savelugu-Nanton District, one of the 26 districts of Northern Region. Its administrative capital, Savelgu, is located 20 kilometres west of Yilkpene and 22 kilometres east of Kpachilo. Figure 3.1 shows a map of Savelugu-Nanton District with the two study communities.

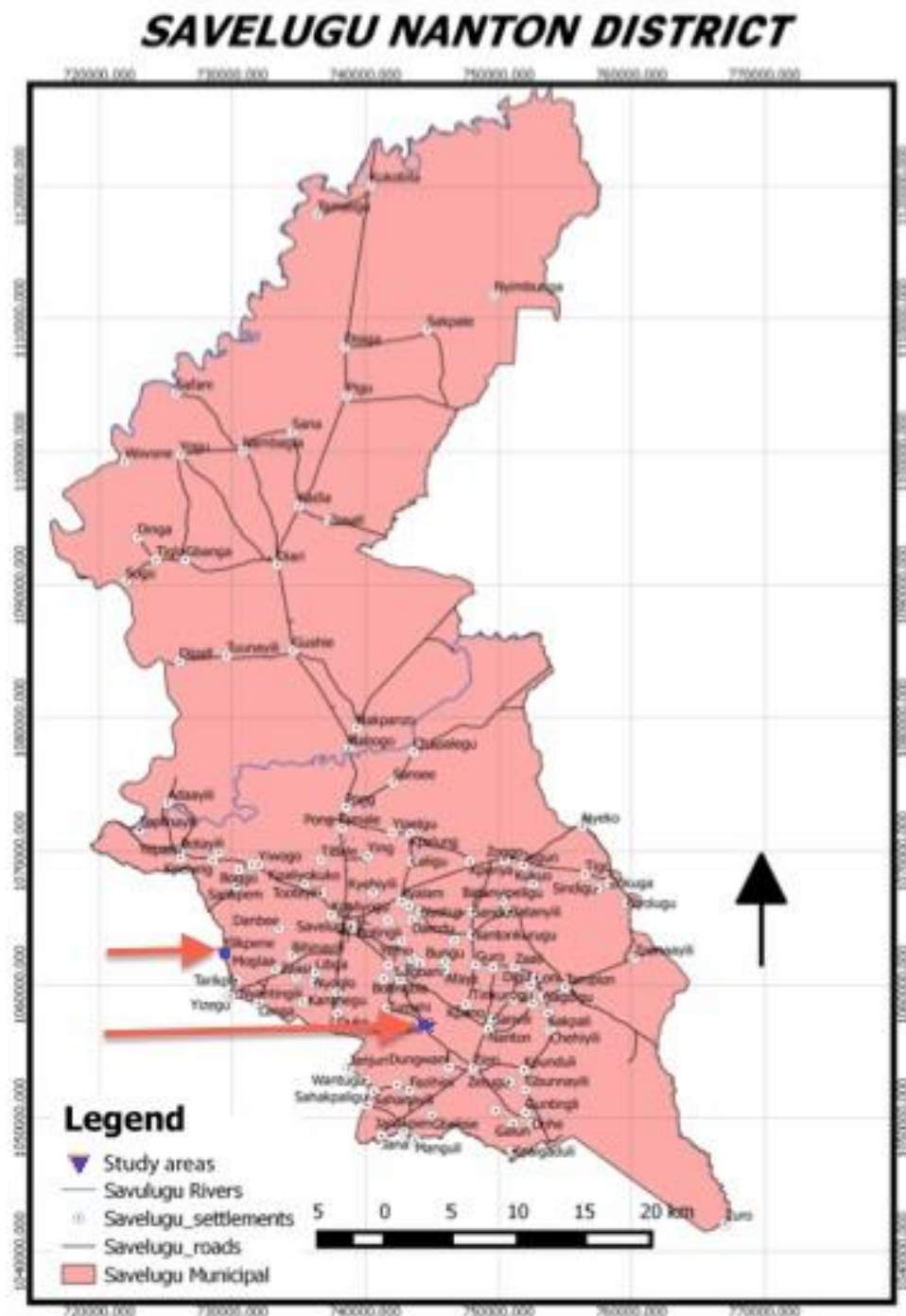


Figure 3.1: Map of Savelugu-Nanton District
Source: Savelugu-Nanton District Assembly (2017)

Savelugu-Nanton District occupies a total land area of about 1,760 square kilometres and has a total population of 1,596,159 (GHS, 2014). The district is predominantly rural with 60% and 40% of its communities being rural and urban respectively. The main ethnic

groups are Dagomba (88.8%), Gonja, Mamprusi and Ewe. Islam is the predominant religion (95.4%).

The district experiences Harmattan, the dry and dusty North-East Trade Wind, from December to March. The mean annual rainfall is 600 mm, which is low but considered enough for a single farming season (GSS, 2014a). The low rainfall coupled with its irregularity has negative effects on crop yields and food security (GSS, 2014b). Less than 50% of the population have access to potable drinking water. The majority get their drinking water from boreholes, hand-dug wells and dams. Sanitation is poor and there is a high scope of open defaecation in the district.

Savelugu-Nanton District is a patrilineal society and authority is traditionally vested in male chiefs, religious leaders and clan heads. Female-headed households form 3.1% of all households (GHS, 2014). Females typically have less access than males to education, health, land, capital and other assets and social amenities (GHS, 2014).

The district has a total of 79 primary schools, 19 junior secondary schools, a special school for the deaf and dumb and one tertiary educational institution. The level of illiteracy is high (78.5% among females and 59.1% among male). School enrolment for boys is estimated at 56% as compared to 35% for girls (GSS, 2014a).

Savelugu Municipal Hospital is the main health facility. Respective proportions of pregnant women with haemoglobin levels of less than 11gm/dl and still-births are estimated at 39% and 1.5%. Malnutrition rate among children below five years of age is about 17.3% while infant mortality prevalence is 6.3% (GHS, 2014).

3.1.1 Selected study communities and justification for selection

One study community was selected from each of two sub-districts. Savelugu Sub-District was purposefully selected because there was data from an earlier ethnographic study (Armar-Klemesu et al., 2014) on the cultural-ecological context of women's nutrition. This data provided important background information for the current study. Yilkpene Community was purposefully selected from Savelugu Sub-District as the intervention community because it is the only rural community out of the three communities included in the 2015 study.

On the contrary, the selection of Kpachilo in Nanton Sub-District as the comparison community was due to similarity to the intervention community based on characteristics to those of the intervention community such as the size of population, dietary practices, occupations, education and access to social amenities. However, owing to a large number of communities which exhibit characteristics similar to those of the intervention community, a random sampling procedure was adopted to choose from the communities. This method involved writing the names of the four remaining sub-districts on four separate pieces of paper which were folded, put in a container and shuffled. One of the folded pieces of paper – that had the name of Nanton Sub-District -was selected as the comparison sub-district. The same random sampling procedure was used in the selection of Kpachilo as the comparison community. The distance between the two selected communities is forty-two kilometres.

3.1.1.1 Yilkpene (*Intervention Community*)

Yilkpene is a rural community in Savelugu Sub-District. In 2017, it had a population of 1,099 including 329 women of reproductive age. The road linking Savelugu to this rural

community is not paved and, therefore, not in a good state for vehicular traffic during the rainy season. The main livelihoods of the inhabitants are farming and trading in food crops. Women typically dominate trading activities in the community. They buy and sell farm produce in neighbouring communities. Other income-generating activities carried out in the community are mat and rope-weaving by men and the processing of rice, shea-butter and groundnut by women.

The community has no health facility but benefits from monthly visits by personnel of the Child Welfare Unit of Ghana Health Service. The nearest health centre to the community is at Mogla, which is about 10 kilometres away. Pregnant women in this community receive monthly ante-natal services at this health centre. Most deliveries are, however, done by traditional birth attendants (TBAs). Emergency cases are referred to Savelgu Hospital for medical attention.

Yilkpene has no market infrastructure but the community is close enough to two prominent markets in Northern Region: Savelugu and Kumbungu. These two markets attract traders from elsewhere in northern Ghana. Members of the community buy and sell from these markets even though a few local traders sell petty commodities such as sugar, milo, salt, tea, bread and sugar-sweetened drinks. Operating only one primary school has contributed to the low levels of education in the community. After completing primary school, pupils can continue with their education at Kumbungu or Savelgu by choosing between walking daily for about two hours or moving out to live with relatives in these two communities and returning to Yilkpene only during week-ends and holidays.

Yilkpene has since 2013 been connected to the national electricity grid. In addition, it takes about 45 minutes to access a bucket of potable water from any of the four boreholes in the community owing to the acute water problem that, in turn, is traced to the low water-table. Only one non-governmental organization (NGO) - Resiliency in Northern Ghana (RING) - was active in the community during the period of data collection. The main activity of RING was to encourage women to participate in making small-scale savings. Previously, there was Regional Advisory Information and Network Systems (RAINS), which provided the community with silos for storing grains.

3.1.1.2 Kpachilo (comparison community)

Kpachilo is a rural community in Nanton Sub-District. In 2016, the community had a population of 828 including 199 women of reproductive age. In addition to farming activities, the women engage in petty-trading activities such as food-vending and processing of shea-butter, groundnut and rice.

Like Yilkpene, Kpachilo has no health facility, no market place and only a primary school. Nanton Health Centre and Savelgu Municipal Hospital serve as its health facilities and provide monthly child welfare and ante-natal care services. Home delivery by TBAs is the norm but complications and challenging deliveries are referred to Savelgu Hospital. In April 2016, the community had four boreholes as its main sources of water. The community has access to electricity even though most households are not connected to power.

Unlike Yilkpene, there is heavy presence of NGOs at Kpachilo. In May 2016, the NGOs operating in the community included Alliance for a Green Africa (AGRA), World Vision

(WV), Resiliency In Northern Ghana (RING), Regional Advisory Information and Network Systems (RAINS), Plan Ghana (PG), Innovation for Poverty Action (IPA), Complementary Basic Education (CBE) as well as Agricultural Development and Value Chain Enhancement (ADVANCE) project. Members of the community reported that World Vision used to promote the use and consumption of moringa and soya bean in the community through annual food and cooking demonstrations for women. The NGOs were also involved in the promotion of formal education. They supported children to enrol and remain in school, provided school uniforms, footwear as well as scholarships for students in senior high school and organized literacy programmes in Dagbani language.

3.1.2 Target population

The target population for the study at baseline and endline were members of selected identifiable groups in the two communities - Kpachilo and Yilkpene. The population comprised men and women aged 15 years and above. The target beneficiaries of the intervention, however, were members of Yilkpene Community. The intervention targeted women, men (including heads of households and husbands), community leaders (chiefs, clan heads, religious leaders, assemblymen and women and leaders of women's groups) and community health volunteers. Both married and unmarried adolescent girls aged 15-19 years of age also participated in the intervention because they were in their reproductive age, a critical stage to ensure optimal nutrition for their future reproductive roles. Boys in the same age group were, however, excluded because they were unlikely to be immediate beneficiaries of an intervention on WRA's diets. At endline, data was collected from community members at Yilkpene and Kpachilo who took part in the

baseline study but for participants at Yilkpene, men, women and adolescent girls who participated in the intervention activities there were targeted.

3.2 Study design

This study was a participatory action research (PAR) initially utilizing a formative research design involving a qualitative exploration of community food system, community members' dietary knowledge and attitudes (perceptions and beliefs) as well as women's dietary practices and reasons for these practices. With the results from the formative study, participatory rapid appraisal methods were used to design and pilot an attitudinal and behavioural change communication intervention with the active participation of key community representatives to address socio-cultural barriers to the consumption of optimal diets by WRA.

This design was chosen because it was relevant to the study. Research methodologists perceive PAR to be both a research design and a philosophical world-view. As a research design, PAR seeks to empower communities to become more aware of their constraints by getting researchers to work with the people as opposed to imposing ideas on them (Savin-Baden and Major, 2013; Loewenson et al., 2014). PAR leans towards the advocacy/participatory paradigm, that believes that research must contain an action agenda for reform that may bring about social change (Creswell, 2007). This way, the approach enables researchers to generate information from the perspectives of communities who are affected by the issue under investigation to inform an intended intervention. The intervention undertaken involves the collective participation of the community with the view of improving the community to produce desired change.

The socio-cultural nature of the study, therefore, called for a research design that is participatory so that key community members and other stakeholders would make inputs into the design and implementation process and become part of the change process without compromising their cultural values that identify them as a group. This way, people were more likely to adopt new behaviour/practices because they were active participants in developing the intervention strategies to drive home change (Savin-Baden and Major, 2013).

The study consisted of five phases as depicted in Figure 3.2.

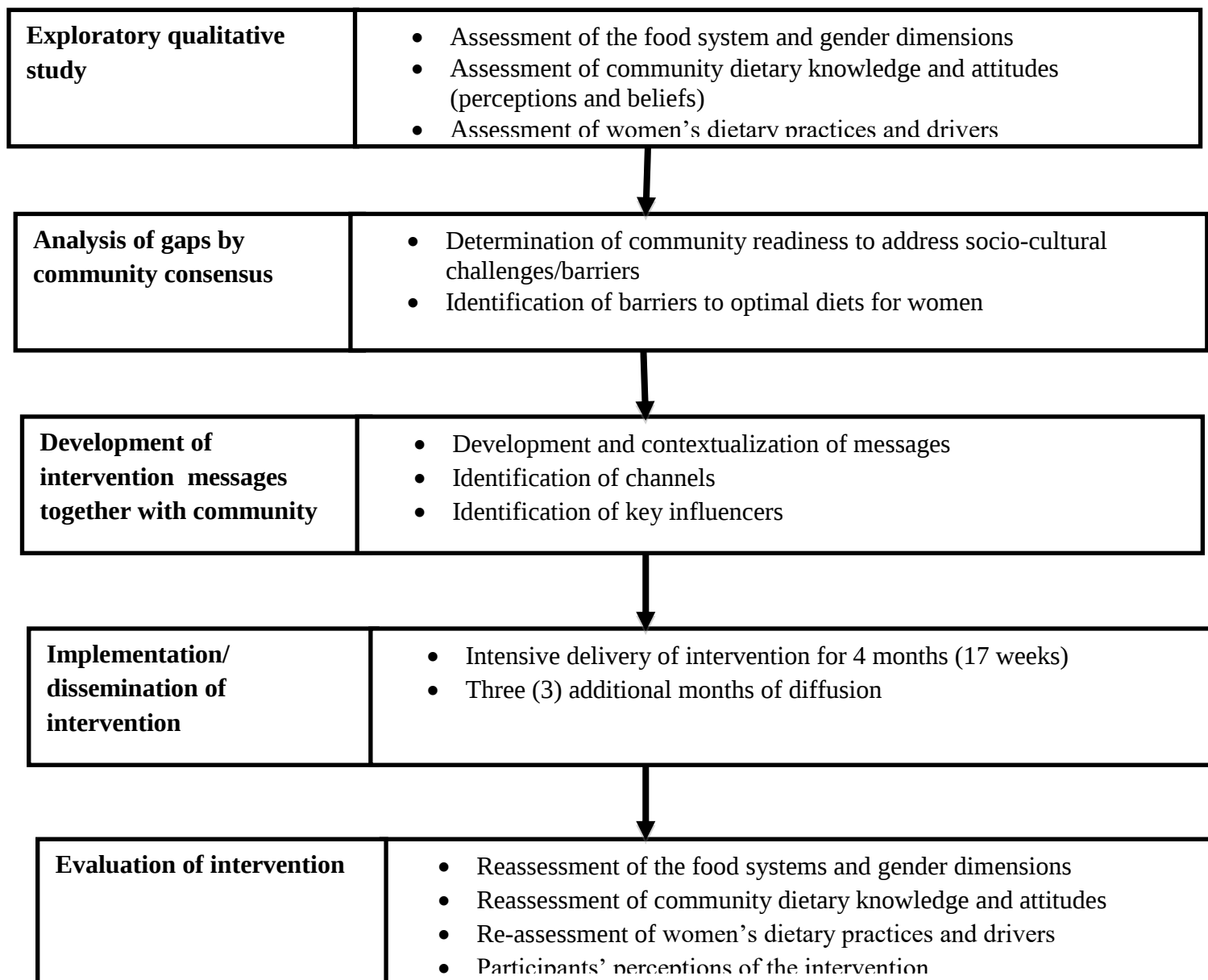


Figure 3.2: Study design

3.3 Study process

The study went through a process consisting of five sets of activities (Figure 3.2) after the chiefs and elders had granted the study team entry into the communities. The assemblymen of both communities led the research team through the community entry processes. The community health volunteers from each of the study communities facilitated the mobilization of members of the communities for the various interviews and group meetings.

3.3.1 Phase 1: Qualitative exploration of the socio-cultural practices

The exploratory qualitative study was the first phase of the study. In this phase, the local food system in the two communities was explored. Women's participation in the food system was explored to understand socio-cultural challenges that impeded their access to adequate food. The study focused on the four-stage food system pathway consisting of food production and use of farming inputs; food processing, preservation, storage and preparation; food distribution and utilization/consumption at the household level. Women's participation in each stage of the food system was explored in detail including gender-based issues within each of the activities. Community members' dietary knowledge and attitudes (perceptions and beliefs) regarding healthy diets, food taboos and food restrictions were explored to identify gaps emanating from their knowledge, misconceptions and belief system.

Dietary knowledge was measured by participants' ability to distinguish between the three food groups as indicated by the Department of Women in Agriculture of the Ministry of Food and Agriculture. The three food groups are energy-giving foods such as cereals and grains, roots and tubers; body-building foods such as livestock products,

legumes, nuts and seeds and protective foods such as fruits and vegetables. Knowledge was also measured by their sources of information on healthy diets as well as knowledge of foods that enhanced WRAs' health.

Attitudes (perceptions and beliefs) that were explored included what participants thought constituted health and healthy diets, their food preferences and reasons for liking and disliking some foods, assessments of women's dietary adequacy in terms of quality and quantity and the effects of women's poor diets on them. Also, participants' perceptions of food shortage and its effects were explored. Participants' attitudes to food such as food taboos and restrictions that affected WRA and their levels of adherence to such taboos and restrictions were explored. Finally, participants' perceptions of the effects of food taboos and restrictions on women's diets were assessed.

The third issue explored during this phase was women's dietary practices and factors that influenced their choices of food. The study explored women's dietary practices by documenting the meals consumed in the 24 hours preceding the day of data collection, frequency of meal consumption, the ingredients contained in each meal, their methods of preparation and members of the households who consumed the same foods. The sources of other foods consumed within the 24 hours were explored.

The main issue of interest in the first phase of the exploratory study was the identification of personal and socio-cultural factors influencing women's dietary practices in the communities. These issues were fed into the design of the intervention activities. The outcome indicators that were measured in the intervention were dietary knowledge and attitudes (perceptions and beliefs). It was envisaged that once the

intervention was able to address the gaps in knowledge and perceptions, the improved knowledge and perceptions should lead to attitudinal change and, ultimately, improved quality of women's diets.

3.3.2. Phase 2: Analysis of gaps by community consensus

Following the exploratory study, two separate activities were held in the intervention community to reach a consensus on, first, whether the community was ready to address socio-cultural challenges to women's diets and, second, what activities to implement to address the challenges. The first set of activities consisted of key informants' interview with six key members of the community and four focus group discussion sessions to assess, through the seven steps proposed for conducting a CRA (Stanley et al., 2014) the level or stage of readiness at Yilkpene for implementing an intervention addressing the identified socio-cultural challenges to women's diets.

The CRM questions (Stanley, 2014) were adapted to suit the focus of the current study. An interview guide was developed along the five CRM dimensions and administered to six key informants; but, to ensure that the opinions of a larger number of members of the community were represented (Pradeillis et al., 2016), four separate focus group discussions sessions, with two sessions each comprising men and women, were held using the same interview guide administered to the key informants. The discussion sessions had an average of 8 participants. The specific issues that were discussed with participants are indicated in the interview guide presented in Appendix C. Using descriptive statements on anchored scores, each dimension was scored. The mean for the collated scores for each dimension awarded by the six key informants interviewed was

used to produce a final community readiness score. This final score was rounded down to a whole number that corresponded to one of the nine stages of community readiness.

The community readiness assessment was followed by a presentation of the baseline results to community stakeholders at a two-day meeting. The aim of the meeting was to reach a consensus on three issues: first, whether the research findings represented the cumulative views of the community regarding women's diets; second, the specific socio-cultural challenges and, third, the approach to be used in addressing them. The stakeholders comprised the district nutrition officer, district agricultural extension officer, a community health nurse and community opinion leaders including the assemblyman for the zone, community health volunteers, a women's leader, the community Imam and chief's elders. In all, 24 members, including the research team, participated in the meeting, which was held in the intervention community. The identified challenges which were presented to the community for deliberations are presented in Table 3.3.

Table 3.1. Identified challenges to women's optimal diets

Climate and farming challenges (natural causes)	Community-level challenges	Household-level challenges	Individual-level challenges
1. Seasonal nature of crops 2. Changes in rainfall pattern (irregular and short duration) 3. Poor soil fertility (soil erosion and continuous cultivation on same land) 4. Dwindling sizes of farmland (through rapid increases in population and urbanization)	1. Lack of dams and irrigation facilities (Lack of dry-season farming) 2. Sale of most nutritious farm produce (legumes and animal-source foods) 3. System of land ownership 4. Observance of food taboos and restrictions 5. Large sizes of households 6. Lack of jobs and credit facilities 7. Inadequate food-vending activities 8. Poor environmental sanitation 9. Inadequate knowledge about women's diets and their relationship to their reproductive health 10. Misperceptions about the health benefits of some foods	1. Household foods not diversified 2. Women's limited control over household food resources 3. Women burdened with providing other food resources for household consumption 4. Preferential food allocation practices (Food-sharing, meat-sharing and parts given to women) 5. Limited preservation practices (drying of limited number of vegetables, little fermentation, direct sun-drying) 6. Inadequate knowledge of food preparation methods (overdoing of vegetables) 7. Women's heavy workload (18 hours day- time activities and 6 hours night sleep)	1. Diets lacking variety (almost one-half of women not meeting MDD-W) Inadequate quantities of body-building foods (legumes and fish) in diets 2. Low consumption of fruits and raw vegetables

The data presented in Table 3.3 shows that the challenges to women's diets in both communities came from four inter-related categories of factors: climate and land, community-, household- and individual-level challenges; however, because the study was focused on addressing socio-cultural challenges, only issues related to the community, household and individual-levels were considered for appraisal at the community stakeholders' meeting. At the end of the appraisal meeting with Yilkpene,

the intervention community, six specific challenges were selected to be addressed in the intervention.

The challenges were: inadequate knowledge of nutritive qualities of different foods and importance of women's diets to their reproductive health; misperceptions about health and healthy foods; poor methods of preservation, storage and preparation of food; poor methods of preservation, storage and preparation of food; poor methods of preservation, storage and preparation of food; Community beliefs and practices contributing to women's poor dietary practices and Women's lack of sufficient power and control over household food resources. While the first two challenges were directly linked to socio-cultural practices, the other four were linked with issues of knowledge and attitudes (perceptions and beliefs) related to diets and healthy diets. Even though the last two challenges were not linked exclusively with socio-cultural practices, they were challenges that the community perceived could have potential impact on their diets and health hence, their inclusion in the intervention.

Two intervention activities (solutions) were prioritized by stakeholders to address the six selected challenges to WRA's diets: The first component of the intervention activities was nutrition and dietary education with emphasis on four issues: first, importance of consuming a variety of foods in their diets; second, importance of adolescent nutrition; third, importance of women's diets and their reproductive health and, fourth, improved techniques of food preservation, storage and preparation. The aim of the nutrition and dietary education was to enhance self-efficacy among members of the community.

The second component of the intervention activities was advocacy on two issues: first, importance of women's access to and control over productive and household food resources to enhance household and women's diets and, second, effects of food taboos on women's dietary quality. Advocacy was meant to sensitize and create collective – efficacy for social change.

3.3.3. Phase 3: Development of intervention together with community

Development of messages and contextualization with community: The identified challenges to women's diets were translated into a communication strategy and culturally-appropriate messages targeted at addressing them. The activities carried out in this phase comprised development of intervention messages together with the community and pre-testing of the messages before the actual implementation. The schedule of communication activities implemented to address the six challenges are presented in Appendix N. A total of 28 messages targeted at the six challenges were communicated to the audience. This section, however, presents a summary of the challenges, the current state of behaviour, interventions (solutions) implemented and their respective key messages in Table 3.2.

Table 3.2: Challenges, current state of behaviour, interventions and their respective key messages

Challenge	Current behaviour/practices	Intervention	Key message
Challenge 1: Inadequate knowledge of nutritive qualities of different foods and importance of women's diets to their reproductive health	Women's diets were found to be limited in variety. The main groups of foods consumed were grains, some leafy vegetables, anchovies and legumes but the amounts of anchovies, legumes and green-leafy vegetables consumed were small resulting in poor qualities of their diets. - Although there was awareness of the effects of poor diets on women's health, knowledge of effects of poor diets on women's reproductive health was limited.	Nutrition education with emphasis on 1) Importance of consuming a variety of foods in their meals, 2) importance of adolescent nutrition and 3) women's diets and their reproductive health and 4) Training on techniques of preservation, storage and preparation of food	<i>Women need a variety of foods in their diets for good health and well-being. Combining and consuming a variety of foods in our meals improve the quality of our diets. Women's diets are important for their health and reproductive health outcomes.</i>
Challenge 2: Misperceptions about health and healthy foods	There were some misperceptions about healthy diets, thus, influencing their preferences for foods.		<i>All foods are healthy depending on how you combine and consume them.</i>
Challenge 3: Poor methods of preservation, storage and preparation of food	Post-harvest food preservation and storage systems were inadequate resulting in a lot of infestation of crops by fungi and weevils. Overdoing of vegetables and little use of fermented foods deprived women of their nutritive values.		<i>Improving preservation, storage and preparation of food enhances the nutritive qualities of diets.</i>
Challenge 4: Poor methods of preservation, storage and preparation of food	Levels of hygiene and sanitation in communities and households were unsatisfactory.		<i>Let's keep our environment clean to avoid contracting diseases.</i>
Challenge 5: Community beliefs and practices contributing to women's poor dietary practices	A number of food taboos and food restrictions negatively affected women's diets. These food taboos and restrictions were linked to both animal- and plant-source foods.	Advocacy on 1) importance of women's access and control over productive and household food resources to enhance household and women's diets and 2) effects of food taboos on women's dietary quality	<i>Address food beliefs, taboos and discriminatory practices to help improve women's diets.</i>
Challenge 6: Women's lack of sufficient power and control over household food resources	Women had limited control over food resources at the household level even though they were expected to contribute to the provision of food to their households. Women also had limited access to productive inputs such as land and labour.		<i>Empower women to have control over food resources so that they can improve their dietary quality.</i>

Identification of channels for delivering messages: The stakeholders together with the research team identified six channels that were used in designing and delivering the messages as well as implementing all the activities planned for the intervention. These channels were community durbars, group meetings with members of the community, home-visits, food demonstration sessions, clean-up exercises and the composition of local songs targeted at women's diets. The schedule of the channels is presented in Table 3.3.

Table 3.3: Channels for delivering intervention

Channels for communication	Purpose/aim	Frequency	Target
1. Community Durbar	To share baseline findings, sensitize community on intervention activities and seek their support for the implementation and sustenance of intervention	Two durbars: one at the beginning and the other at the end of the 17-week activities	Whole community
2. Training	To build capacity of implementation team especially the community partners for the delivery of the intervention messages	Two days of training and pre-testing of messages	Thirteen-member implementation team: eight selected members of the community, 4 research assistants and the principal student-researcher
3. Weekly group meetings	To improve community members' knowledge and attitudes in respect of women's diets	24 group meetings: 12 group meetings each for men and women	Men, WRAs, older women and adolescent girls
4. Home-visits	To discuss and encourage participation in the group meetings, encourage adoption/practice of BCC messages and to address misconceptions and other issues arising from the group meetings	One home-visit per compound/household	All 56 households in community
5. Food demonstration sessions	To improve community members' knowledge on methods of food processing and preservation, improve household cooking practices through enriching household diets with legumes in particular and cooking vegetables for shorter periods of time	Two sessions	Men and women
6. Composition of songs in the local language	To sustain participation and interest in the intervention	Throughout the implementation period; two local songs composed	Whole community
7. Clean-up campaign	To emphasize the importance of good environmental sanitation and to sustain interest in intervention activities	Four exercises: one exercise per month for 4 months	Whole community

An implementation plan was developed with the community stakeholders to guide the implementation process (Appendix L). The plan spelt out the various activities and topics that were discussed every week. The meetings were held weekly- that is, on Saturday mornings from 10 a.m. to 11 a.m. During each meeting, one topic was discussed and promoted for the week. The group was led to review the messages the following week before the introduction of a new topic. A total of 138 women and 91 men participated in the group meetings. A register was developed to keep track of

attendance (participation in the meetings). Each compound in the community was visited once during the period of intervention and at least a woman from each of the households attended the weekly meetings.

Two sessions of food demonstration exercises were held. One session concentrated on training participants on the use of local and waste materials to prepare insecticides and improve soil fertility, prevention of post-harvest losses and improved ways of preserving crops to avoid aflatoxin. Additionally, participants were taken through ways of preserving vines of the orange-flesh sweet potato. A total of 138 members of the community (89 females and 49 males) participated in this session. The other session concentrated on demonstrating the cooking of some common dishes in the community through the addition of soya bean flour to enrich their nutritive contents and cooking vegetables to minimize nutrient loss. A total of 174 members (102 females and 72 males) participated in the cooking demonstration session. The ingredients and methods adopted for the cooking demonstrations are presented in Appendix O.

To sustain participation and interest in the intervention, the entertainment group in the community composed two songs which were sung amidst drumming and dancing during the course of some of the weekly activities. The lyrics of the songs were based on the intervention messages and included issues of sanitation, importance of women's diets and food in general. In delivering the intervention activities, four principles of adult learning were adopted (Lieb, 1991). These principles were respect, adults' autonomy and self-directedness, experience and knowledge and, last, their readiness and orientation to learn. The research team acknowledged the fact that participants had a wealth of experiences regarding the focus of the study and this knowledge was utilized during the discussions and interactions with them.

Identification of community influencers: The stakeholders selected eight members of the community to join the research team to form the implementation team for the execution of the intervention. The eight persons selected were the local Assemblyman, the assistant Chief Imam, two community health volunteers, a women's leader, leader of the youth sanitation group, the leader of the community entertainment group and the chief-crier. These community-appointed members of the team were responsible for mobilizing people for the subsequent intervention activities and delivering the weekly messages with support from the research team. During the two-day stakeholders' meeting, snacks were made available to the intervention team.

3.3.4. Phase 4: Implementation of intervention

The intervention was a 17-week community-based attitudinal and behavioural change communication intervention, which utilized existing community groups and resources in the design and implementation process. This exercise involved the participation of identified community stakeholders in the development of context-appropriate educational messages on women's diets and advocacy on women's empowerment (specifically, women's control of food resources). The messages were targeted at identified socio-cultural norms as well as personal factors that constituted barriers to the achievement of optimal diets for women in the intervention community. Selected community members assisted the research team to delivery the educationation and advocacy messages during the intervention activities. The intervention was embedded in a pre- and post-intervention design with a comparison group - a quasi-experimental design (Fisher & Foreit, 2002). The quasi-experimental design is illustrated in Figure 3.3 as follows:

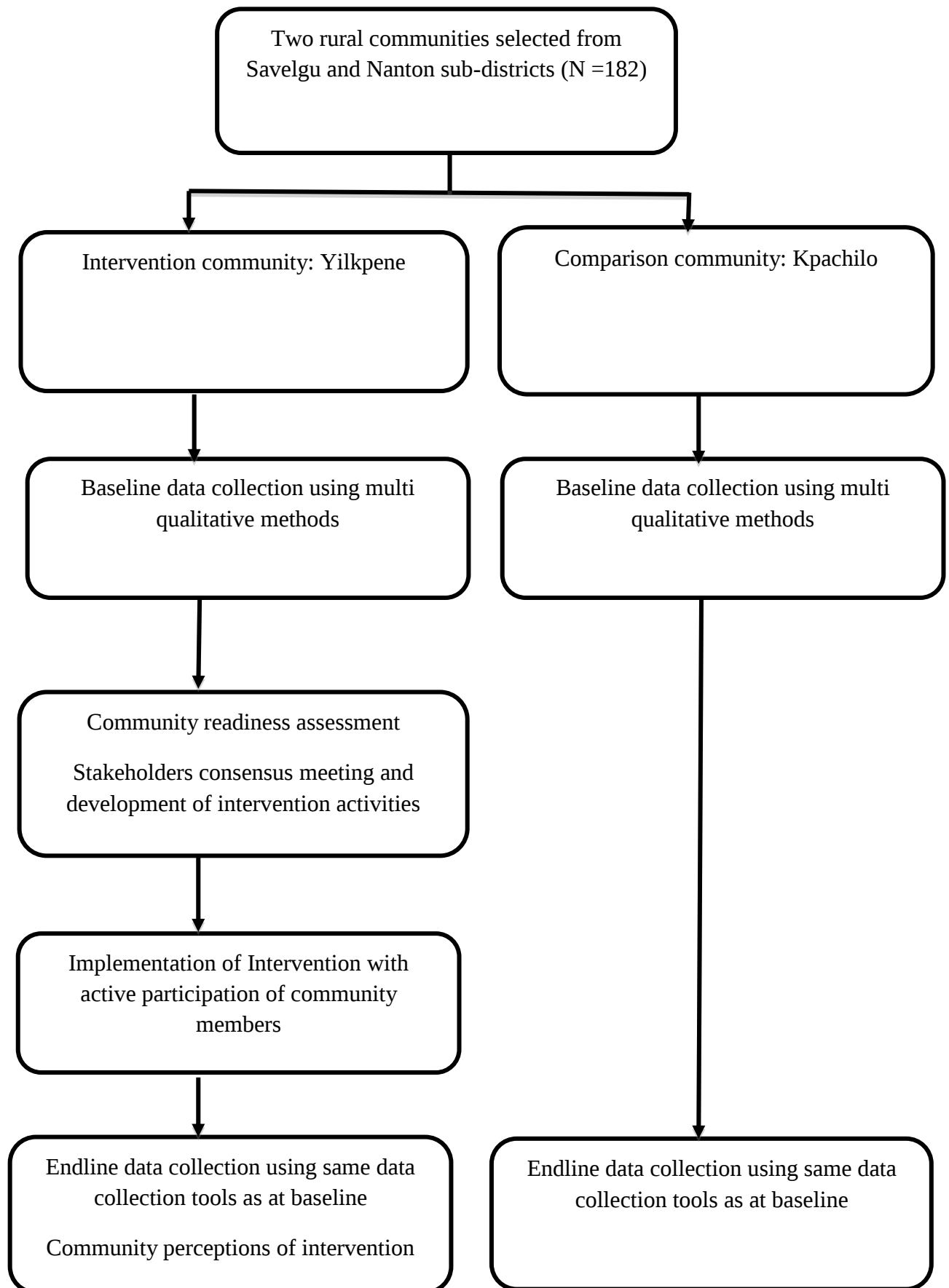


Figure 3.3: Illustration of quasi-experimental design for implementing attitudinal and BCC intervention

The quasi-experimental design was chosen for three main reasons. First, the qualitative nature of the entire study did not require randomization in the selection of participants and, therefore, a design which did not require random assignment of participants was most appropriate. Second, the financial resources needed to carry out a true experiment such as a randomized controlled trial (RCT) were beyond the researcher's reach. Last but not least, the time needed to complete a truly randomised controlled trial was not feasible given the researcher's time frame for completion of the thesis.

The venues for the meetings to deliver the intervention activities were four locations where different groups in the community usually held their meetings. The first venue was the chief's palace where the women ("amasachina" group) usually held their meetings. The second venue was a school block which served as the venue for both the stakeholders' meeting and training of the members of the implementation team. The community durbars and food demonstration sessions were also held on the school premises. The space under a big baobab tree served as the venue for the meetings of both the men's group and demonstration lessons on proper ways of preserving food and preparing local insecticides. The last set of venues consisted of the homes of individuals or compounds involved in the home-visits.

3.3.5 Phase 5: Evaluation of intervention

Post intervention data collection was carried out between August and November 2017. A period of four weeks was devoted to collecting data. Transcription and data management and analysis lasted a period of three months. Both implementation process and outcome evaluations were reported. The implementation process evaluation aimed to determine whether the intervention was delivered as planned. The attitudinal and BCC strategy that

contained the educational messages for the intervention and its implementation plan as well as the weekly field notes during the implementation was used to assess the fidelity, dosage, target and unforeseen bottlenecks of the intervention and how they were addressed. Additionally, participants' assessment of the intervention was carried out.

3.4 Methods of data collection

Qualitative data collection methods were employed for this study. A number of qualitative approaches to data collection were reviewed to assess their suitability for this study. A cocktail of qualitative methods were used for collecting the different but relevant sets of information from different categories of study participants to address specific objectives. The methods used were key informant interviews, focus group discussions and qualitative 24-hour dietary recall with in-depth interviews as well as household and community observations.

The purpose for using a mix of qualitative methods in this study was to ensure that the relevant issues at stake were explored in detail to understand women's dietary behaviour more holistically. For instance, while the key informant interviews, focus group discussions and community observations focused on community-level factors affecting women's dietary behaviour, the qualitative 24-hour recall with in-depth interviews as well as the household observations focused on household practices and women's daily experiences related to their dietary practices. Triangulating data from these multiple sources gave a better understanding of women's dietary situation in the study communities. Understanding community, household and individual factors facilitated the design of a participatory behavioural change communication strategy for addressing identified socio-cultural challenges to women's optimal diets in the study communities.

Presented in Table 3.4 are the data collection methods together with the specific tools used in collecting information from participants. The table further indicates the phases of the study that utilized specific methods in collecting information.

Table 3.4 Data collection methods, tools, phases in which used and information collected

Data collection method	Data collection tool	Phases in which used	Data collected
Key-informant interview	Key-informant interview guide	1, 2 and 3	Socio-demographic characteristics; food system components (food production, processing and preservation, distribution and utilization/consumption); control of food resources at the household level; food availability and access; community readiness for an intervention addressing challenges to women's diets and community assessment of the intervention
Focus group discussion	Focus group discussion guide	1, 2 and 3	Participants' socio-demographic characteristics; community knowledge, and attitudes (perceptions and beliefs) regarding food and health, awareness of food taboos and restrictions and levels of adherence; effects of food taboos on women's diets; perceptions of healthy foods for WRA; sources of dietary and health information; community food preferences; community readiness for an intervention addressing challenges to women's diets and community assessment of the intervention
24-hour dietary recall	24-hour dietary recall guide	1 and 5	Detailed description of all foods consumed at breakfast, lunch and supper as well as water and beverages consumed 24 hours preceding the interview; methods of preparing these foods, in- and out-of-home eating habits
In-depth interview	In-depth Interview guide	1 and 5	Sources of household food, decision-making and consumption arrangements at the household level
Community observation	Community observation check list	Throughout study	Members' daily routine activities regarding their social and economic activities; sources of main staples in the communities; market days, outdoor ceremonies as well as a funeral ceremony
Household observation	Household observation check list	1 and 5	Composition of households, hygiene practices, women's daily chores and their time-use; household food preparation and sharing; meal times and frequency of meals consumed by WRA

Key-informant interview participants: The key informants comprised two categories.

The first comprised key informants within the community, namely community health

volunteers, chief's elders, chief imams, male and female farmers, women's leaders and traditional birth attendants (TBAs). The second category comprised the district agricultural and nutrition officers, a community health nurse and local representatives of NGOs who work in collaboration with the community. Some key informants were interviewed in their homes while others were interviewed at their workplaces.

Focus group discussion participants: Separate focus group discussion sessions were held with men, women of reproductive age, young, unmarried adolescent girls aged 15 to 19 years and elderly women (aged 50 and above). The group of young adolescent girls who were recruited for the FGDs included both in-school and out-of-school girls. Each session comprised an average of 9 participants.

Observation targets: Direct observations were done at both the community and household levels in respect of women's dietary practices. The community observation lasted the whole period of the study (from April 2016 to November 2017). The household observations lasted 12 hours- from 6a.m. to 6p.m. In all, 10 households- that is, 5 households each in the intervention and comparison communities -were observed.

Qualitative 24-hour dietary recall: The qualitative 24-hour dietary recall involved a recall of the foods consumed by women aged 19- 49 years in the immediate 24 hours preceding the day of data collection. The aim of the recall was to determine WRA's achievement of the minimum dietary requirement for women (MDD-W)- that is, the average dietary quality or nutrient intake). Twenty women each from the intervention and comparison communities were involved in the recall - making a total of 40 women. These same 40 women were followed up during the post-harvest period (that is,

November), six months after the baseline study was done in May – June, to collect the qualitative 24-hour recall data to assess the effect of seasonality on the quality and frequencies of foods consumed (FAO, 2011). Each woman's dietary information was collected four times: it was collected at baseline in May-June 2016 - when it was perceived there was food shortage – and, again, in November 2016 - when food was perceived to be in abundance. The recall was repeated at endline in May-June and November 2017.

In-depth interview: In addition to the information collected through the 24-hour dietary recall from the 40 WRA, information on sources of acquisition of food for the households as well as the decision-making and consumption arrangements was collected through in-depth interviews. This information was collected soon after the 24-hour recall sessions for each of the 40 women in only May-June at both baseline and endline.

The data collection tools that were used at baseline and endline included a key-informant interview (KII) guide, a focus group discussion (FGD) guide and household and community observation check lists. The other tools were qualitative 24-hour recall tool and an in-depth interview guide. In addition, a community readiness assessment guide was adapted from the CRM and used to assess the intervention community's readiness for an intervention. This tool was administered after the initial baseline study. At endline, a community assessment guide was, again, included for participants in the intervention community to assess the intervention. These guides were administered to both key informants and focus group discussion participants (Appendix C). The use of interview guides and checklists to guide the data collection process was relevant in ensuring that topics of interest to the issues being discussed were not overlooked. Additionally, it

ensured that in respect of each of the topics, as much detail as possible was gathered with a lot of probing and, in some cases, prompting for further explanations. All the data collection tools are presented in Appendices A to H.

3.4.1 Sampling of participant categories

At baseline, the study used purposive sampling owing to the need to provide information relevant to the issues at stake. There was, therefore, the need to use community volunteers to assist the research team to identify the appropriate potential informants.

At endline, recruitment of participants for the various categories of interviews was, again, purposively done. Regarding the 24-hour recall, household observations and in-depth interviews, the same participants who were recruited at baseline were used for the assessment phase. The key-informant participant category comprised, as much as possible, either participants who were interviewed at baseline or their representatives. The focus group discussion participant category in the intervention community, however, comprised 3 categories of participants: those who participated in less than 6 group meetings; those who participated in either 6 or 7 group meetings and those who participated in 8 up to 12 group meetings. The essence of grouping the FGD participants on the basis of exposure or participation to group meetings was to assess the correlation between this variable (scope of exposure/participation) and levels of knowledge on issues discussed at the group meetings. The FGD sessions were organized for men and women separately. Table 3.4. gives a break-down of the numbers of participants interviewed by methods.

Table 3.5: Methods, participant categories, number of interviews, samples of participants in baseline, endline and community readiness assessment (CRA) phases of the study

Participant categories	Number of participants in baseline phase			Number of participants in CRA	Number of participants in endline phase			TOTAL
	Interv. comm	Comp. comm	Sub-Total		Interv. Comm	Comp. comm	Sub-Total	
KEY INFORMANTS								
Community health volunteer	1	1	2	1	1	1	2	5
Chief’s elder	1	1	2		1	1	2	4
Chief Imam	-	1	1		-	1	1	2
District agricultural extension officers	1	-	1	1	1		1	3
District nutrition officer	2	-	2	1	1	-	1	4
Community health worker	1	-	1	1	1	-	1	3
NGO representative in community	1	-	1	1	1		1	3
Women’s leader	1	1	2		1	1	2	4
Male farmer	1	-	1		1	-	1	2
TBA	-	1	1		-	-	-	1
Assemblyman	1	1	2	1	1	-	1	4
Sub-total	10	6	16	6	9	4	13	35
FGD SESSIONS								
Men	2	2	4	2		1	1	7
WRA	2	2	4	2		1	1	7
Elderly women	1		1					1
Adolescent girls	1	1	2			1	1	3
Attendance at 8 or more meetings					2		2	2
Attendance at 6 and 7 meetings					2		2	2
Attendance at less than 6 meetings					2		2	2
Total number of Groups	6	5	11	4	6	3	9	24
Total number of participants	48	39	87	33	52	20	72	
Average number of participants in a group	8	8		8	9	7		
Qualitative 24-hour recall with in- depth interviews-WRA	20	20	40*		20	20	40*	
Observation of women’s time-use	5	5	10*		5	5	10*	
Community observations								
Total (all methods)	78	65	143	39	81	44	125	

It is shown in Table 3.7 that key participant categories in the communities that were involved in the baseline, community readiness assessment and endline phases of the study included WRA and, particularly, pregnant and lactating women. In addition, male and female heads of households, elderly members of the community, chief's elders, chief imams, farmers, local government officers (district agricultural extension and nutrition officers) and NGOs working with the women in the communities were included.

One hundred and forty-three (143) participants constituted the sample for the baseline phase in addition to 39 participants for the community readiness assessment- making a total of 182 participants for the study. At endline, 125 of the 143 participants at baseline participated. The intervention community had 78 and 81 participants at baseline and endline phases respectively and the comparison community had 65 and 44 participants at baseline and endline respectively. Table 3.6 presents the total number of interviews conducted at baseline and endline.

Table 3.6: Number of interviews by methods at baseline, CRA and endline

	Baseline		CRA	Endline		Total
	Yilkpene	Kpachilo	Yilkpene	Yilkpene	Kpachilo	
KII	10	6	6	9	4	35
FGD	6	5	4	6	3	24
24-hour recall+ IDI	20	20	—	20	20	80
Total No. of interviews/transcripts	36	31	10	35	27	139

The composition of the participants on the basis of the methods used in gathering the data shows that there was an aggregate of 139 interviews. In terms of types, these were

35 KIIs, 24 focus group discussion sessions and 80 24-hour recall with in-depth interviews.

3.5 Data recording, management and analysis

A total of 139 interviews were conducted with most of them in Dagbani and only three in English. The interviews were audio-recorded with participants' consent, transcribed verbatim into English and imported into Nvivo for data management. A note-taker took notes during the interview. At the end of each day, the notes were coded to identify emerging issues that required follow-up.

“Interim” analysis was done alongside data collection to reflect on emerging issues, to refine the questions and to summarize what was said during the interviews (Pope, Ziebland, & Mays, 2000). After data collection, thematic analysis was used to explore more intensively how community, household and personal factors affected the quality of women's diets (Braun & Clarke, 2006). The thematic analysis consisted of six steps - namely, familiarization with the data collected; generation of initial codes; searching for themes; reviewing themes; defining and naming themes and producing the results.

The steps were followed by reading and rereading the transcripts, listening to the recorded interviews and taking note of frequent expressions from participants; for instance, *“food that makes one drink a lot of water is healthy”* and *“food that makes you sweat a lot after eating is healthy”* were coded as perceptions of healthy foods. All noted expressions were coded systematically across the entire data set. Verbatim responses were collated and assigned to each code. After this, all the coded responses were collated into initial themes and sub-themes. Each major theme was given a working definition

and imported in Nvivo so that the various responses from the transcripts that related to each theme were pooled together. Finally, the major themes and sub-themes formed the basis for reporting the results. Data recording, management and analysis was similar in all the phases of the study. The themes and sub-themes were used to analyze the endline data by using the same thematic analysis framework.

3.6 Emerging themes and sub-themes

Themes and sub-themes that emerged from the data recording, management and analysis are presented in Table 3.7.

Table 3.7: Themes and their sub-themes

Objectives	Themes	Sub-themes
1. To describe the food system and women's interaction with it in Savelugu-Nanton District	The food system and gender-based issues	Gender-driven access to productive resources Gender differences in types and use of foods produced Women's role in processing, preservation and storage of food Gender roles in food distribution and household allocation Gender dynamics in household food provision, preparation and sharing Food shortage, coping strategies and effects on women's diets
2. To assess communities' dietary knowledge and attitudes at Yilkpene and Kpachilo in Savelugu-Nanton District	Community dietary knowledge and attitudes	Knowledge on nutritive qualities of foods and sources of information Perceptions of health, healthy foods and community food preferences Perceptions of nutritional adequacy of women's diets and effect on women's reproductive health Community members' beliefs about food
3. To describe women's dietary practices	Women's dietary practices	Women's eating pattern and dietary diversity Drivers of women's dietary choices
4. To assess the drivers of women's food choices	Drivers of women's dietary choices	
5. To assess Yilkpene's readiness to modify socio-cultural barriers to women's optimal diets	Level of community readiness for socio-cultural intervention on women's sub-optimal diets I Yilkpene	Community knowledge of women's sub-optimal diets Community knowledge and efforts addressing challenges to women's diets Community climate regarding women's sub-optimal diets Community leadership in support of efforts addressing women's diets Community resources to address challenges to women's diets Exposure to and coverage of intervention activities
	Description of implementation of intervention	Modifications and adaptation of initial plan -Improved dietary knowledge -Changes in some dietary misconceptions -Modifications of plant-based food restrictions -Minor changes in women's dietary practices
6. To test the post-intervention change in community dietary knowledge and attitude (perceptions and beliefs) at Yilkpene	Change in dietary knowledge and attitude	
	Community perceptions of the intervention	Intervention messages recalled by participants Messages practised by participants Messages not practised by participants Benefits of intervention to community Challenges related to the intervention activities

Analysis of dietary information: Data on all foods consumed by each of the women who participated in the 24-hour dietary recall was used to assess the quality of their diets. Women who consumed diets from 5 or more food groups were classified as meeting the minimum dietary diversity for women (MDD-W) but those who consumed foods from less than 5 groups were classified as not meeting the minimum dietary requirements (Martin-Prevel et al., 2017; FAO & FHI360, 2016).

Analysis of intervention results: Analysis of the intervention results was carried out by comparing outcomes in the intervention community with the outcomes in the comparison community. The comparison was done at a single point following the intervention (the single difference impact estimate) (White & Sabarwal, 2014).

3.7 Monitoring the process

During the 17 weeks of implementation, different strategies were used to monitor the study. First, there was a record of participation using a register of participants' names and households. Second, home-visit records helped to assess the individuals' participation in the group meetings. If the hosts or hostesses had participated in group meetings, they were asked to recount some of the messages they had heard and whether they had ever tried to practise any of them. The visiting team corrected misconceptions or misunderstandings that they detected. The team also reinforced relevant specific messages. Furthermore, husbands, heads of households and elderly women were encouraged to support women to practise the recommended behaviours since the former (men and elderly women) can influence the choices the latter make regarding their food and nutritional needs (Ahrari et al., 2006). Additionally, participants were asked to give their impressions of the intervention. While the BCC activities were going on in the

intervention community, a monthly report of the activities in the comparison community was recorded.

Implementation activities ended after 17 weeks of intensive BCC in the community covering the period 25th December, 2016 - 23rd April, 2017. A period of 3 months (May, June and July 2017) was allowed for the community to assimilate the messages and for the research team to assess if there would be any observable application of the messages in the women's dietary behaviour.

3.8 Quality assurance in the study (trustworthiness)

A number of steps were taken to ensure the quality and trustworthiness of the study (Lincoln & Guba, 1985). Trustworthiness implies the accuracy and consistency of the study and the extent to which its results can be trusted based on four criteria proposed by Guba (1981). The first criterion is credibility –that is, accurate recording of issues investigated and producing results that are convincing and believable. The second criterion is transferability- which implies generalizing results to similar contexts or findings being applicable to other contexts with similar characteristics. The third criterion is dependability -implying replicating the study in similar contexts and arriving at similar results. The last criterion is conformability which suggests that the researcher is as neutral as possible during the research process with very minimal investigator biases (Shenton, 2004). These criteria were achieved at different stages of the research process by using various strategies.

The study adopted appropriate and well-recognised qualitative research methods such as focus group discussions, key informant interviews and observations which complemented one another in gathering rich data. In using these methods, the support of research assistants was needed. At the pre-data collection stage, four research assistants were recruited and trained to collect data during the baseline phase and implementation of the intervention. The research assistants were all holders of master's degrees in nutrition. They were trained for a period of five days on the objectives of the study, techniques of qualitative interviewing, note-taking, data collection instruments and verbatim transcription of recorded interviews into English. The data collection instruments were also pre-tested in a different but similar community with the assistants to determine their accuracy and consistency in gathering the required information. Applying “probes” and “prompts” as and when necessary allowed participants to give detailed descriptions of issues as far as they could.

The investigator's twenty-one-month engagement with the communities (from March 2016 to December 2017) enabled participants to develop high level of trust and confidence in her so they gave their candid views on issues. At the end of the baseline study, the information gathered was shared with the whole community at a durbar to confirm its credibility. To enhance the credibility of the quasi-experimental design, the two communities were selected on the basis of their non-proximity to minimize information contamination.

The nutrition education counselling cards, which were based on the three food groups developed by Women in Food and Agriculture (WIFA) of the Ministry of Food and Agriculture (MOFA), were adapted by the implementation team to develop the nutrition

messages. Also, both communities were monitored during the implementation of the intervention to take note of other on-going activities whose impact might influence its outcome – that is, to avert intervention contamination. In the comparison community, for instance, a number of nutrition-related interventions by World Vision were on-going while Ghana Health Service had similar activities running in both communities. This information contamination was used to explain the outcome of the intervention.

To ensure transferability and dependability of the study results, detailed descriptions of the two communities and the methods and procedure for gathering and analysing the data have been provided earlier in this chapter. The detailed description ensures that the findings of this study are generalizable only to communities with similar characteristics and that similar results may be obtained if the study is replicated in similar communities using similar methods and procedures. Additionally, justifications for choosing the methods used in the study and an audit trail for the data analysis are presented to minimize investigator biases. Conformability was achieved, first, through the use of the same data collection tools at baseline and endline and, second, through the use of different data collectors at endline so as to minimize effects of investigator bias as much as possible.

3.9 Ethical considerations

Noguchi Memorial Institute for Medical Research (NMIMR), University of Ghana, Legon, granted ethical clearance for the study (Reference No. (CPN): 077/15-16). Permission to carry out the study was obtained from Savelgu-Nanton District Assembly and the chiefs of the two selected communities where data was collected. Their support for the study was solicited after being informed about the purpose and procedures.

Ethical issues addressed during data collection included obtaining informed consent from participants and informing them of possible risks and discomfort their participation may cause, their right to leave the study and possible benefits to them and the whole community. To obtain informed consent from participants, they were provided with general information about the purpose of the research and what they were expected to contribute to ensure its success was spelt out to them. The majority of participants gave their consent by thumb-printing on the agreement section of the consent form. Consent for the adolescent girls who were below 18 years of age was obtained from their parents or guardians.

The issue of possible risks and discomfort was addressed by assuring participants that the study would not involve any invasive procedures in collecting the data so that any unforeseen risks it might incur as a result of their participation would be minimal. The only anticipated discomfort was associated with the time spent to discuss the issues relevant to the study. In this regard, participants were encouraged to spare about one hour of their time to discuss the issues. The burden of the study, participants were assured, would be borne by the researcher.

The issues of participants' participation, confidentiality, safety and right to leave the study were addressed in three ways. First, at each stage of the research process, participants were encouraged to participate fully in all aspects of the study by giving their candid opinions on issues being discussed and asking questions when necessary to keep the discussion interesting and participatory. They were further encouraged to share their personal experiences as they related to issues being discussed. Second, participants were assured that their records regarding their participation in the study would be strictly

protected. In this respect, participants' true names were replaced with dummy ones in the transcripts and also they did not appear in the reports. Third, participants were told they could pull out of the study at any point or stage of the study if they so wished.

Participants were told at the start of the interviews and group discussions that their involvement in the study would not attract any monetary compensation for information volunteered; however, each of the participants at baseline and endline was given a bar of soap valued at ten Ghana cedis (GHc 10.00) as a token of appreciation of their time spent in participating in the study. Similarly, each of the eight community volunteers who were members of the implementation team was given a monthly incentive of one hundred Ghana cedis (c100.00) for a period of 4 months.

The incentive was meant to encourage the volunteers to suspend all other activities on the dates set for the intervention activities so as to mobilize the community and to lead in the dissemination of the intervention messages. The study communities were assured that the study was going to benefit them immediately by improving their knowledge on diets and health, which would enhance the health statuses of members of their households in general and the women in particular as well as improving the well-being of the communities at large.

Even though the comparison community did not benefit directly from the intervention activities, a half day community meeting was organized to share the baseline results with members of the community. The dissemination meeting helped to improve their awareness of the importance of consuming variety of foods in their meals and the importance of diets for WRA. It is hoped that a similar intervention would be organized for the comparison community if some funding is secured.

CHAPTER FOUR

4.0 RESULTS OF THE STUDY

This chapter presents the results of the study. The chapter is organized into four main sections namely, the participants' characteristics, pre-intervention (baseline) results, implementation of the intervention and post-intervention results. The pre-intervention results describe the situation in the two study communities and are organized into four sub-sections: the food system and women's role in it; community dietary knowledge and attitudes, women's dietary practices and drivers of their dietary choices and community readiness to address challenges to women's diets. The process data from the implementation section describes how the community engaged with the intervention activities, coverage of intervention and modifications and adaptations with respect to the original intervention design. The post-intervention section describes changes in dietary knowledge, attitudes and women's dietary practices. The section also describes community members' assessment of the intervention.

4.1 Study participants' socio-demographic characteristics

Table 4.1: Participants' socio-demographic characteristics

Characteristics	Yilkpene (119)			Kpachilo (63)			Total (182)		
	Male n(%)	Female n(%)	Sub-total n(%)	Male n(%)	Female n(%)	Sub- total n(%)	Male n(%)	Female n(%)	Total N(%)
1. Sex	43(36.1)	76(63.9)	119(65.4)	16(25.4)	47(74.6)	63(34.6)	59(32.4)	123(67.6)	182.(100)
2. Marital status									
Single	11(25.6)	0(0)	11(9.2)	31(8.8)	8(17)	11(17.5)	14(23.7)	8(6.5)	22(12.1)
Married	32(74.4)	76(100)	108(90.8)	13(81.2)	38(80.9)	51(81)	45(76.3)	114(92.7)	159(87.4)
Widow	0(0)	0(0)	0(0)	0(0)	1(2.1)	1(1.6)	0(0)	1(0.8)	1(0.5)
3. Women's groups									
Pregnant		13(17.1)			10(21.3)			23(18.7)	
Lactating		22(28.9)			16(34.0)			38(30.9)	
NPNL		20(26.3)			10(21.3)			30(24.4)	
Adolescent girls		9(11.8)			8(17.0)			17(13.8)	
Elderly women (50+)		12(15.8)			3(6.4)			15(12.2)	
4. Education									
None	13(30.2)	72 (94.7)	85(71.4)	1(6.3)	44(93.6)	45(71.4)	14(23.7)	116(94.3)	130(71.4)
Primary	7(16.3)	1(1.3)	8(6.7)	8(50)	2(4.3)	10(15.9)	15(25.4)	3(2.4)	18(9.9)
Secondary	8(18.6)	3 (3.9)	11(9.2)	2(12.5)	1(2.1)	3(4.8)	10(16.9)	4(3.3)	14(7.7)
Arabic	15(34.9)	0	15(12.6)	5(31.3)	0	5(7.9)	20(33.9)	0	20(11.0)
5. Occupation									
None	0	9(11.8)	9(7.6)	0(0)	8(17.0)	8(12.7)	0(0)	17(13.8)	17(9.3)
Farming	34(79.1)	64(84.2)	98(82.4)	16(100.0)	39(83.0)	55(87.3)	50(84.7)	103(83.7)	153(84.1)
Formal-sector employment	9(20.9)	3(3.9)	12(10.1)	0(0)	0	0(0)	9(15.3)	3(2.4)	12(6.6)
6. Monthly income (Ghc)									
Mean	121,07	41,29	81,18	135,83	48	91.90	112,33	42,47	80,23
Range	40--320	16--128	16--320	100--245	28--100	28--245	40--320	16--128	16--320
7. Sizes of households									
16--15			45(37.8)			38(60.3)			83(45.6)
16--40			71(59.7)			22(34.9)			93(51.1)
Missing cases			3(2.5)			3(4.8)			6(3.3)

The total sample of participants was 182. Females dominated the sample in both communities but the female –male gap was wider at Kpachilo (49.2% - that is, 74.6% - 25.4%) than at Yilkpene (27.8% - that is, 63.9% – 36.1%). The proportion of married women was higher at Yilkpene (90.8%) than at Kpachilo (81%). The minority of women in the two communities were elderly (50+ - 12.2%). Similar proportions (71.4%) of participants in the two communities had no formal education. Higher proportions of participants at Yilkpene, however, had Arabic education (12.6%). Farming was the dominant occupation in either community (84.1%). The majority of participants in either community earned less than GH500.00 monthly (92%). The sizes of households were generally large ranging from 16 to 40 persons per household. The proportion of households at Yilkpene with members ranging from 16 to 40 was 59.7% compared to 34.9% at Kpachilo. The missing cases (3.3%) were participants whose socio-demographic characteristics were not complete.

4.2 Pre-intervention (baseline) results

Baseline data was collected in the two study communities as part of the pre-intervention activities. This section presents results on the themes that emerged from the data. These themes include the food system and gender-based issues, community dietary knowledge and attitudes, women’s dietary practices and drivers of their dietary choices and Yilkpene’s level of readiness to address socio-cultural challenges to women’s diets.

4.2.1 The local food system and gender-based issues

The food system in the two study communities is built around an agrarian economy that involves food production, processing, preservation and storage, distribution and utilization/consumption. Men, women and children perform diverse roles within the

different components of the system. While some roles are performed based on gender, both men and women are involved in others.

4.2.1.1 Gender-driven access to productive resources

Women are unable to produce large quantities of food because they have limited access to and ability to produce inputs/resources for production. The following narrative expresses how women feel about their inability to produce enough food owing to their limited ability to access food resources such as land:

“But if women had large tracks of lands like the men, we wouldn’t be struggling to put food on the table... But how can we produce large quantities of food? We don’t have the resources to do so, so we keep to smaller land and manage with it” (Pre intervention Female, KII K09).

Farming inputs including land, labour, seeds, farming implements and chemical fertilizers are important determinants of food production; however, access to these inputs is gender driven. Key informants indicated that household land-holdings, which are generally small, ranged between 10 and 15 acres in size and are usually shared only among male members of the household. Women, therefore, have less access to land in this highly-patrilineal society. Women are not considered part of their fathers’ households hence, allowing them inheritance to their fathers’ or family land would deprive the fathers’ household of land once the women got married into other households. Female FGD participants explained women’s lack of access to farmland in particular as emanating from their traditional inheritance system:

“It’s because if a woman inherits the land from her father, it’ll not benefit his household any more because once the woman gets married, she’ll take the produce from the farm to her husband’s house to feed its members. (Pre-intervention FGD Yilkpene, elderly women).

A married woman could, however, have access to a portion of her husband's farmland as stated by a community leader at Kpachilo as follows:

“If your wife expresses interest in farming, it's you yjr husband's responsibility to look for land for her to farm and if she gets much yield it's for you and your wife” (Pre-intervention FGD community leaders K27)

Alternatively, a woman can borrow land from neighbouring communities if she has the financial resources to carry out farming activities as expressed in the following narratives:

A part from going to other neighbouring communities, women who have the financial resources to undertake farming activities may also borrow land from other families in their communities if those families wouldn't be farming on their land for a particular farming season” (Pre-intervention KII Y22)

Women's limited access to farmland contributes to their inability to grow a variety of food crops in appreciable quantities to meet their food needs and those of their households. Productivity among women is also limited by their inability to procure labour or receive compensation for labour. Traditionally, women are expected to contribute labour for their husbands' farms but the reverse is not practised.

“As for your wife, it's a must for her to come to the farm and help. If she doesn't come, who else can come? The only reason your wife can't come to help you harvest is ill health. In that case, she wouldn't be at fault and her portion will be served. But if she refuses to come for any other reason, well, it has never happened before. She must be on the farm” (Pre intervention, Men FGD, K 31)

Additionally, men can hire labour that is paid for through the sale of their farm produce. Because women do not have productive capital, they are usually constrained, and, thus, unable to hire labour. Women assist in planting crops (except yam), cook for farm labourers, harvest the produce and carry it home but other farming activities such as preparation of land for planting and making of beds and mounds for planting of yam and

cassava are the preserves of men because they are perceived to be beyond women's physical strength as narrated by one key informant:

“But, then, it's usually yam and other root crops which are difficult for the women to cultivate because they require physical strength, which the women don't have; and so, it's the men who usually produce them. Even with that, if a woman can pay for others to work on the farm for her, then she can produce the crops that demand physical strength” (Pre-intervention KII Y22)

When women are hired by other households for farm work such as to harvest crops, they are paid in kind compared to men who are paid in cash:

“For families without matured sons, they pay for others to work on their farms but the payment is usually made to men. Women who help on the farm are given portions of the produce as their rewards” (Pre-intervention KII Female K25)

Apart from preserving seeds to be used in subsequent planting seasons, buying and occasional assistance from non-governmental organizations are common in the communities. Farming equipment and agro-chemicals are usually accessed from the market. Women may be constrained from purchasing these inputs by their limited financial situation.

4.2.1.2 Gender differences in types and use of foods produced

Women's productivity is limited by their traditional role of cultivating crops with low market values. The two communities share similar practices in that they mainly produce food for home use and for sale. Crop production is the main livelihood; livestock farming is a supplementary activity. Even though tradition does not spell out categorically what kinds of crops men and women should produce, it was observed and reported that gender plays a significant role in the types of crops produced and their socio-economic importance in the two communities. This claim is supported by the response from a male key informant when he was asked whether there were specific crops cultivated by men and women in the communities. The informant indicated that

even though both genders were at liberty to produce any crop of their choice, the ability to do so depended on one's access to productive resources such as land and finance:

“There're no specific crops produced by men or women in this community. As long as you've the land and you're strong enough to produce a particular crop, then you just do so. If a man or woman has land, depending on what the land is fertile for, then he or she produces it. But then it is usually yam and other root crops, which are difficult for the women to cultivate because they require physical strength, which the women don't have; and so mostly, it's the men who produce them. Even with that if a woman can pay for others to work on the farm for her, then she can produce the crops that demand physical strength” (Pre-intervention KII K22).

Table 4.2 shows the types of foods produced in the two communities and those men and women dominate in producing.

Table 4. 2: Types of foods produced

Food production	Predominantly for home-consumption		Predominantly for sale	
	Men	Women	Men	Women
1) Crop production				
a) Commonly-produced crops	Maize, guinea-corn	Maize and groundnut	Rice groundnut, cow-and pigeon-pea; okro, tomato, pepper, garden-egg water-melon	Rice, Soya bean, okro
b) Less commonly-produced crops	Millet melon-seed (neri and agushie) yam; sweet-potato; cassava, cotton		Millet bambara bean, yam cashew nut	
c) Crops harvested from the wilds		Ayoyo, bra, kuka, baobab fruit, dawadawa fruit, shea-fruit, mango, ebony fruit, “sinsaba”(black berry)		Shea-nut
2) Livestock production			Cattle, sheep, goat, fowl, guinea-fowl, rabbit and egg	

The foods produced in the study communities included cereals/grains, roots/tubers, legumes/seeds/nuts, green-leafy vegetables, other vegetables, fruits, meat and egg. Maize, guinea-corn and groundnut constituted the main staple crops. Men controlled cultivation of staple crops for home consumption but when they produced nutrient-rich legumes in large quantities, they were often sold for money. A female focus group discussion participant supported the claim that men often sold out nutrient-dense foods, leaving very little or none at all for home-use with the following narrative:

“Even if our husbands harvest some of these crops (beans, Bambara, pigeon pea etc.), they sell them at the market. If you’ve the money, you can buy otherwise you miss those foods that add variety to your food. In a few cases, the men may leave some for us at home but that’s small and won’t be enough to last long” (Pre-intervention FGD women K 34).

The assertion by the focus group discussion participant at Kpachilo was confirmed by one of her counterparts at Yilkpene as follows:

“The men don’t just harvest their groundnut and give you your portion as they do with the maize. No way. You have to work to earn it so the harder you work, the more groundnuts you accumulate to last long. As for the men, their portions go to the market” (Pre-intervention FGD women, Y34)

Additionally, men dominated in the cultivation of crops with high market values such as tomato, pepper, rice and cashew-nut. The main market crops cultivated by women were rice, soya-bean and okro. Cotton and melon seeds used to be common ingredients in soups but they were currently less cultivated owing to unfavourable weather conditions. Production of yam and millet, which used to be important cash crops in the communities, had also dwindled for the same reasons as with cotton and melon seeds. A male focus group discussion participant indicated that such nutritious foods were scarcely available in the communities:

“So these days, cotton seed (kanton) isn’t in great supply. Very few people cultivate it...Yes, and neli (melon seeds), yam and millet too aren’t being cultivated in large quantities because the rains are poor and cultivating them has become a problem” (Pre-intervention FGD men, Y35).

Women mainly harvested nutrient-rich vegetables and fruits from the wild; however, these were seasonal crops and, were thus, not available throughout the year unlike the staple crops. The communities were not interested in cultivating foods collected from the wild. One key informant explained during the community readiness assessment that they were not cultivating the foods obtained from the wild because it was not important to put their efforts into producing crops that grew naturally:

“One doesn’t look for what one already has but rather puts efforts into finding what one doesn’t have” (CRM 14).

Although men and women were involved in livestock production, men dominated the control and utilization of livestock resources. A male key informant defended this practice during the exploratory phase of the study as follows:

“In this community... the men have total control over everything concerning the livestock... She can’t do that (sell her livestock) without the man’s consent... The way women are, if you allow them too much authority today, tomorrow she’ll ride on your back...” (Pre-intervention KII Y24).

Key informants indicated that even though livestock was reared primarily to obtain savings, animals might be used as food during festive occasions and to welcome special guests. This assertion was made bluntly by a male focus group participant at Kpachilo:

“Those animals you see around are investment for us like the bank accounts you people have. Madam, you don’t just withdraw money until the need arises” (Pre-intervention FGD Men, K28).

The above assertion was confirmed by a male key informant at Yilkpene. He identified the value of livestock to the community as their form of investment and explained that they consume them only during festive occasions:

“To be frank, we hardly kill any livestock for personal consumption. We usually kill livestock during occasions such as a naming ceremony, marriage or funeral. Other times that we can kill any livestock for preparation of food are when we get important visitors. Besides these occasions, we rear livestock so that when we’re in need of money, we can sell them or when we run out of foodstuffs, we can sell these animals to buy needed foodstuffs” (Pre-intervention KII Y23).

4.2.1.3 Women’s role in processing, preservation and storage of food

Although women were involved in all aspects of post-harvest activities including food preservation, they had little economic value for them. Women’s role in husking maize, rice, millet, guinea-corn and also in shelling legumes (beans, groundnut) was narrated by a female key informant at Yilkpene:

“The harvesting and the dehusking are mostly done by men and women. Whenever the crops are ready for harvest, we go and harvest them and gather them under a shade on the farm so that we can sit there to remove the husk. Then we carry it to the house where we look for a shelling machine to do the shelling - that is, if it’s in large quantities. Otherwise, we do it manually. We then dry the produce in the sun” (Pre-intervention KII Y22).

Women also the primary group for processing of shea-nut, dawadawa and groundnut, boiling and milling of rice as well as fermentation of grains. Both men and women participated in solar drying of grains, legumes and some root crops (cassava in particular). The drying of vegetables such as bra, kuka, pepper and okro was dominated by women as explained by a key informant at Yilkpene:

“As for vegetables, when it’s their season like the rainy season, the women harvest them only on days they need to use them to cook. Vegetables decay fast and so they can’t be stored for long. We dry some of them like okro, bra and kuka. This activity is usually done well by women” (Pre-intervention KII Y22)

Traditionally, men had the responsibility of storing household grains and their other farm produce in food barns and silos (if they own them). On the other hand, women mostly stored their produce in sacks but they did not offer adequate protection against insect pests which attacked the stored food. Women were, thus, more likely to suffer post-harvest losses. A female key informant explained the predicaments of women during post-harvest storage of their produce:

“After husking, we dry the maize and then shell it. The women bag their produce and store it in rooms but most men store their produce in silos. What you should know is that, once the maize is being put into silos, there’s no need to add chemicals to prevent weevils from spoiling the grains because the silos are air-tight. However, with the bags, you have to spray the produce with chemicals to prevent weevils and other insects from destroying them but the women are unable to afford such chemicals”(Pre-intervention KII Y22).

4.2.1.4 Gender-based roles in food distribution and intra-household allocation

Women exerted a lot of energy in the distribution and sale of farm produce. Foods produced in the two communities for sale was usually sold either at the farm-gates to traders or carried to Nanton, Savelugu, Kunbungu and Tamale markets for sale. Both men and women were responsible for determining the prices of their produce and selling it. This role of both men and women was explained by a male key informant at Yilkpene:

“But the produce belongs to me. Why should someone sell it for me? I sell it myself. Anyone who plants and harvests sell the produce himself or herself. Sometimes, people (traders) from elsewhere come to the community to buy it but at other times, I send it to Savelugu Market by means of a motor king to sell” (Pre-intervention KII Y22).

Women further assisted in transporting the produce home or to the market by carrying the loads on their heads. Men, however, would be involved in transporting farm produce to the market if they had access to mechanized/motorized transportation such as bicycles and “motor-king”.

Traditional roles of resource management favoured men. Men traditionally controlled the allocation of stored grains that women used for preparation of food for the household.

Male focus group discussion participants at Kpachilo confirmed this practice:

“They (women) have to wait for their husbands or men to give them portions of grains for the management of the home” (Pre-intervention FGD men K34).

Allocation of grains for the household’s use was usually done once each week. In polygamous households, the allocation was done on the basis of which wife had the turn to prepare meals. Women were not traditionally allowed to enter food barns to take grains for preparation of meals. A male focus group participant at Yilkpene defended the “no entry for women” on the basis of mismanagement of grains by the women:

“The freedom for women to go into the grain barns to fetch grains by themselves is impossible. Women aren’t allowed to go into the grain bans or silos to take grains for the home. They’ve to wait for their husbands or men to give them portions for the management of the home. If allowed, they’ll mismanage the grains and, in no time, nothing will be left to survive us for the rest of the year” (Pre-intervention FGD men, Y35).

This tradition is enforced as a taboo. The reason for this taboo was the perception by men that women are not good stewards of stored grains, was confirmed by a male focus group discussion participant at Kpachilo:

“They (women) will mismanage the grains and in no time nothing will be left to survive us for the rest of the year” (Pre-intervention FGD, men, K30).

The men’s stance was more or less supported by a female focus group discussion participant at Yilkpene:

“It’s believed that if a woman is seen going into the barns to fetch grains, her children will turn up to be thieves” (Pre-intervention FGD Females Y30).

While some women agree with the perception that women are poor managers of food resources and hence the need for men to control household grain, not all women are happy with this tradition on grounds that the freedom to have direct access to grains makes it possible for them to feed the households better. Another female focus group discussion participant at Yilkpene said the following in support of men controlling household food resources:

“Because some women will mismanage the supply, even if the men say we can go in for the grains, we won’t go. They should just give us our portions to go” (Pre-intervention FGD Females Y31).

A female participant at Kpachilo supported the “no entry for women” tradition on grounds of making men responsible for replenishing grain barns:

It’s to the benefit of us all. This prevents us women from misusing the grains until it was time to farm again for new foodstuffs. But if women are allowed to manage the grain barns and the foodstuffs are finished and the man isn’t able to provide any, then the woman will be the very person to provide the grains. That’s what we don’t want. That’s why we’re according the men that respect to fetch the grains for us to cook” (Pre-intervention FGD women k27).

A female focus group discussion participant at Yilkpene, however, held a contrary view about gran allocation by men:

“We wish we could be allowed to get all our food needs to be able to feed our households well but we are limited” (Pre-intervention FGD Women, Y31).

In other words, grain allocations by men, is perceived by some women as inadequate for the needs of their households. Some men, however, had an issue with that view. To them, the allocation of grains is usually planned with the women, who decide on how much grain will suffice for a specific period. A male focus group discussion participant at Yilkpene explained how the planning is done:

“You know a man doesn’t decide by himself how much grain will suffice the house. He discusses it with the woman and she tells him how much is needed for

a certain period. So once the man knows this quantity, he plans his harvest and knows how long it'll last. If it won't be enough for the year, he makes plans about how to cope until the next farming season. So if a man gives out grains to last till a certain period but the woman comes in earlier than that time to say it's finished, she must be answerable for that. She can't even come and ask for more"(Pre-intervention FGD Males Y35).

Some women, however, indicated that their requests for additional supplies of grains are usually honoured by their husbands or heads of households when they run out of grain before the stipulated time. A female key informant at Yilkpene explained the tradition of making supplementary allocations:

"If the grains given get finished, you go and tell him again and he'll dish out additional grains. But, how you manage to grind the grains, get ingredients, firewood, etc is no longer his problem"(Pre-intervention KII Y26).

Giving of farm produce, usually grains, as gifts after harvest is a common practice that minimizes the effects of food shortages on vulnerable households. In these communities, widows, the elderly, chief imams and ultra-poor households receive provisions of food from households whose harvests are good in a season. According to a key informant at Kpachilo:

"If you bring the food home after harvesting, you have to give some to the chief of the community even if it's just a bowl of the grains that you can give to him. If you have a bumper harvest, say 10 bag of rice, you can decide to give one bag to your Imam. You go and leave it in the mosque and the Imam will decide what to do with it. So we do give some of our food out as gifts. Sometimes too, you could also give to the aged in the community" (Pre-intervention KII, K22).

Food resources are also distributed freely during festivals, funerals and marriage ceremonies. Even though men take the decision to give out the foods, women usually carry them to the beneficiaries in their homes.

4.2.1.5 Gender dynamics in household food provision, preparation and sharing

In spite of their inability to access and control household food resources, women are expected by tradition to provide food to complement men's provisions for the households. Preparation of food for the household is the sole responsibility of women. Men are traditionally responsible for providing staple (grains) components of household meals. Women are expected to provide the ingredients needed for preparing the soup. These ingredients include anchovies (small herrings), salt, onion and bouillon cube. One female key informant explained the responsibilities of men and women regarding provision of food for households:

"It's not also his responsibility to give you money to buy ingredients to prepare soup. His responsibility is just to provide the grains for you. So we use our own money to prepare the soup. No, the piece of land they apportion to us to farm is what they expect of us to get the funds from for the ingredients, when we plant groundnut, we also plant okro so that when they both mature we can sell and consume some at home" (Pre-intervention KII Y26).

A hierarchical system of power among women centralizes decision-making. At the household level, older wives are responsible for the preparation of major meals such as lunch and dinner while younger wives are responsible for preparing breakfast. A key informant gave an account of decision-making among women in a polygamous union regarding food preparation for the household:

"It's the first wife and her co-wives who are responsible for cooking. If they are 3 or 4 wives, the first two or three will be responsible for preparing the food and they will do so alternatively but the youngest wife (that is, the last wife) will be responsible for preparing koko in the morning. So when you're giving the senior wives their grains, you'll give the youngest wife too her portion" (Pre-intervention KII K22).

The decision to consume a particular food is a joint decision arrived at between men and women. The female participants in the focus group discussion sessions indicated that the decision to eat a particular food in a household depends on the kinds of foodstuffs

provided by their men but women determine the soup and other sauces that accompany the main meal. An in-depth interviewee at Kpachilo narrated the tradition in her household:

‘My husband provides us with maize but I decide about the kind of food to cook based on the ingredients he provides. After harvest, he would store the maize and the guinea-corn for our consumption and only sell them if new yields are in and we haven’t run out of stock. However, when it comes to the ingredients for soup, it’s left to us women to provide them’ (Pre-intervention IDI, K3b).

Traditional practices about preparation and sharing of food limit women’s dietary quality. In addition to preparing meals, women serve it out to members of the household. There is a specific tradition with food service. Women serve their portions first, followed by those for the heads of households, elderly women, young men, young women and, last, children. Female focus group discussion participants at Yilkpene further explained that although women are served first after cooking, they do not eat first:

“The fact that we serve our bowls before other household members does not imply we get the lion’s shares or we’re the first to eat. No! We only put a little in our bowls simply because we cooked the food and want to be sure the food is good enough to be consumed by other members of the household. Then after every one else is served, whatever is left is added to our bowl. If nothing is left, then we resort to other people’s leftovers. Sometimes, we even have to add ours to the children’s if they don’t have enough to eat. As for we women, if we don’t get anything to eat, it is ok. We can always manage to survive. But all other members of the households must get something to eat. Even sometimes if we get unexpected visitors, our bowls of food are sacrificed for them” (Pre-intervention FGD Women, Y34).

Usually, women are the last to eat after everybody else is satisfied and would not need additional food as indicated by the female FGD participants above. Furthermore, if visitors arrive without prior notice at mealtime, the woman’s food is often offered to them - thus, leaving her with little or no food at all. One female participant at Yilkpene, however, explained that a woman never goes on an empty stomach as she always

manages to get some leftover from other members of the households after they have all eaten to their satisfaction:

“But this rarely happens. At least, we always manage to get leftovers from other members of our households to eat. We never starve in the house. We might not get the best portions to eat but we manage to get by with the little leftovers. More often than not, we get enough into our bowls” (Pre-intervention FGD Women, Y34).

Sharing of meat is done by the male head of the household or elderly men at both the household and community levels. Similarly, when there is a social occasion and meat (whether raw or cooked) is to be shared, elderly men usually perform this task. A female participant narrated the process of sharing meat among members of a household:

“You see the thigh and breasts of the fowl, they go to the men. Then the neck and wings go to the young men. The back and waist go to the women and the legs and head go to the children. The men can explain why that’s done. The bony part is given to us women because we need stronger bones to carry the next generation of children. So by eating the bones, we make our bones stronger to carry healthy pregnancy and be delivered safely” (Pre intervention FGD women, Y34).

Participants reported patterns of social interactions during mealtime determined by gender and age. Wives usually eat together. Other groups also eat together including older women, young women or girls, young men and children. Male heads of households eat alone. If there is only one elderly woman, she also tends to eat alone.

4.2.1.6 Food shortage and coping strategies

Women’s access to optimal diets is affected by seasonal food shortages. Participants reported that staple foods (particularly cereals and legumes) are usually available throughout the year. On the other hand, seasonal foods like vegetables (including green-leafy vegetables) and fruits are only available for brief periods in the year unless they are processed into dry products. The availability of food depends on adequacy of rains for

production and storage from the previous farming season as explained by some key informants:

“As I told you, except for a year that rains aren’t enough for us, food is always available in the community but, then, it’s most abundant during the harvest period” (Pre-intervention KII, K26).

Another key informant at Kpachilo had earlier stated the importance of preservation as a coping strategy:

“The fact is that for all the foods, we’ve specific times for harvesting them and we harvest most of them at the same time but how we preserve them is what makes them last long. We harvest them and keep and eat them gradually until the next farming season but even if stocks get depleted, we can still get some from the market to buy so we have them all year round” (Pre-intervention KII K22).

Food is most abundant during the harvest period. Key informants reported that during the periods of September to February, all crops, with the exception of green-leafy vegetables, are abundant at the household level; however, the period between the months of April and August is a lean period characterized by food shortages. This period is when food crops have been planted and are awaiting harvest. During this period, even though fresh leafy vegetables are available, the main staples (maize, guinea-corn and groundnut) are typically in short supply. A key informant explained the period of food shortage in the following narrative:

“Yes, we call it the “fufali saha” (“hunger time). This period is when you use all the food you have to farm and then midway, the food in the house is finished and the crops too aren’t even ready for harvesting. So that time, things are really difficult for most households” (Pre-intervention KII Y26).

Both Yilkpene and Kpachilo employ similar coping strategies including decreased consumption, increased buying of staples and borrowing grains from neighbours. During periods of shortage, men reduce quantities of grains allocated for cooking for the

household. As a result, households reduce daily frequencies of meals or sizes of portions of meals served to members of the households, especially women. The following quotation explains the coping strategy adopted at the household level to manage food shortage:

“For instance, if you’ve three wives and during the time of harvest, when food is in abundance, you can give each of them four bowls of maize to cook for a week, that will amount to twelve bowls of maize in a week. When there’s scarcity of food, you can reduce the weekly allocation from four to three bowls of maize each so that the weekly allocation of twelve bowls of maize will be reduced to nine. The women will, in turn, reduce the sizes of portions of the food after it’s prepared to accommodate the reduction in weekly allocations” (Pre-intervention KII Y23).

The subsequent key informant at Yilkpene confirmed women’s sacrifice of their own portions of food:

“When it happens like this, the woman begins to ration the food. For instance, if she used to serve herself a full bowl of TZ, during the rationing period, she can reduce it to a half-bowl” (Pre-intervention KII Y24).

During the lean season, when some food ingredients are scarce, women cope by enhancing palatability of meals with bouillon seasoning. Although men dislike use of bouillon seasoning in meals, they are unable to restrict women from using it. Also, during periods of low availability of food, men may sell livestock, groundnut, pigeon- and cow-peas, and soya bean and use the income to purchase grains. In some cases, household property and income from casual labour may provide resources for purchasing grains. Women complement men’s income by selling shea-nut, firewood and personal effects (clothing). Women may also migrate to southern Ghana to work as potters during the off-farming season to earn money to supplement household incomes. Men may also borrow grains as a coping strategy. Additionally, resources from remittances and support from non-governmental organizations (NGOs) provide support during periods of

insufficient food resources. A key informant gave an account of some of the coping strategies households and the community adopt during food shortage:

“We sell the animals we raise to purchase the food ... in our family during scarcity-we sell some properties to buy food for the house and decide who among the young men would go to the south to work as a farm-labourer. Others in the community sometimes borrow from their neighbours. For some of us, we do petty trading to support the households during these times” (Pre-intervention KII, male, Y21).

4.2.2 Community dietary knowledge, attitudes and sources of dietary information

4.2.2.1 Knowledge of nutritive qualities of foods and sources of dietary information

Knowledge about the nutritive benefits of foods was sub-optimal among both male and female participants in both communities. Although participants believed they produce health-giving foods, there was no consensus on the right classification of food on the bases of the three food groups (body-building, energy-giving and protective foods) among focus group discussion participants. The following narrative is an example of how some participants in the study communities classified the various food crops produced in the communities.

“Foods like maize, millet, rice, yam cassava, fufu give us strength, a lot of blood and good health. They make you drink more water when you eat such foods and that makes us healthy... The fruits also add blood” (Pre intervention FGD women K29).

Some key informants, however, identified legumes, meat/fish, egg and vegetables as rich sources of blood-forming nutrients (iron) and smooth skin. Cereals, roots and tubers were associated with filling the stomach and giving energy. Vegetables (tomato and fruits) were associated with preventing constipation and diseases when eaten in moderation. The women in the in-depth interviews reported awareness of beneficial

health components in the foods as well as the medicines (iron-folate supplements) they receive during ante-natal and post-natal care visits:

“What I know is the medicine that they give pregnant women during ante-natal services when they go monthly for weighing. The medicines give them blood and then it makes them healthy. Some people also say that the medicines make the babies grow very big” (Pre-intervention IDI Woman, K35).

The main sources of information on women’s health and diets are health facilities, households and community meetings. In addition, dietary and health information was obtained from elderly persons, family members, friends and teachers. Female participants indicated that during ante-natal and post-natal visits to the hospital, the health-care attendants educate them about their health including what they need to eat to enhance their health statuses. Female participants indicated they are advised by health workers to eat a lot of plant-based foods to enhance their health:

“Ok, when we go to the hospital we’re always told to eat a lot of vegetables like ayoyo, alefu, and bra. We’re also told to eat a lot of amani and dwadawa and prepare the food under hygienic conditions so that when the children eat they’ll be healthy as well as we the women. We also get to know from people like you during community meetings. We learn a lot from our discussions with you” (Pre-intervention FGD women, Y30).

Female adolescent participants confirmed the health facilities as one of the sources of dietary information in the communities:

“Our mothers talk about them when they come back from the hospitals. They talk about how the doctor wants them to eat some kinds of foods in order to keep both themselves and their babies healthy” (Pre-intervention FGD adolescent girls K31).

4.2.2.3 Perceptions of health, healthy diets and community food preferences

Perceptions of health and healthy diets

Participants often discussed diet in relation to their health. Many participants demonstrated misconceptions about what constitute good health. Some perceived health as the absence of disease or signs of ill-health, having good appetite for food and water and the ability to sweat. In respect of the perception of a healthy diet as one that induces sweating, a male participant's comment was as follows:

“If after eating a meal, one experiences profuse sweating, then one will know one has gained health from consuming that particular food. Therefore, one can say the food is healthy. And as you know, sweating after eating a meal is a sign of good health. So foods that make you sweat after consuming them are healthy foods” (Pre intervention FGD Men, Y35).

Second, health was linked with physical energy to carry out daily activities. According to a female focus group participant at Kpachilo:

“When a person is healthy you'll realize he or she has the strength and gets active and performs her daily chores well. But with sickness, you'll realize the person isn't always active” (Pre intervention FGD women, K30).

Third, the female participants linked health with peace. Women get worried when they are unable to provide food needs of their children and other members of the household as indicated by some of the women in the FGD sessions:

“If you've your peace of mind and nothing worries you, then you can also say you're healthy. Once you aren't worried, you can eat well and carry out your daily chores satisfactorily; but if you're worried about even how to feed your family or you've financial worries, then you've no peace and can't function well. In that case, you can't be said to be healthy” (Pre-intervention FGD, Women Y34).

Finally, health was associated with physical appearance. A plump-looking body was considered an indication of good health. On the contrary, being skinny was linked with poor health:

“If a person is healthy you'll see that the person is fat but when a person is very lean, it means the person isn't healthy” (Pre intervention FGD women, K29).

Participants identified health-giving foods as having four main characteristics: meal composition of food; perceived benefits of food; perception of hygienic nature of food and its environment and whether the food is recommended by a health professional. Ingredients such as “dawadawa”, fish, meat, egg and condiments were considered important ingredients in a meal. Participants in the 24-hour recall in-depth interviews indicated the importance of dawadawa and animal source food in keeping healthy:

“If food is prepared with dawadawa, fish, eggs and meat, then it’s healthy” (Pre-intervention IDI Y09).

Foods perceived to give blood, promote weight-gain, promote healthy, smooth skin and support copious production of breast-milk are linked with good health. A participant substantiated the claim with reference to the content of a particular food as a characteristic of its healthiness:

All these raw materials that I’ve mentioned (dawadawa, fish. Eggs and meat) give blood so if they’re in a particular food and you eat it, you’ll get a lot of blood and so be healthy” (Pre-intervention IDI Y04).

Foods, which, when eaten, induce drinking of a lot of water, profuse sweating and production of breast-milk are also considered healthy. Such foods are thought to prevent sicknesses as explained by some focus group participants:

After eating such a meal, you drink a lot of water. That’s what I call a healthy meal” (Pre intervention FGD men, K31).

The ability of hot foods to induce profuse sweating was mentioned by participants as the reason for considering them as healthy:

“Well, the hotness of the food makes it healthy and that’s why lactating women are advised to eat hot foods to produce more breast milk. Foods that make you sweat after eating them are healthy” (Pre-intervention FGD Women Y34).

Both men and women considered food hygiene as an important indicator of healthy food. They indicated that food should be prepared in a clean environment by using clean utensils and materials as well as observing good personal hygiene. A female participant indicated that keeping the cooking environment in a sanitary condition enhances the healthiness of food:

“What makes you know your food is healthy is when you ensure the place you prepare your food is clean by sweeping the place and also wash all your dishes. After cooking and serving, you cover the food right away to prevent flies from settling on it” (Pre-intervention FGD women K29).

Fourth, some participants perceived foods recommended by a health professional as healthy:

“If you want to know whether a particular food is healthy, then it must have been recommended at the health facility for someone to eat it because that food will enhance his or her health.....You may also fall ill and some foods may be recommended to you by the doctors to eat in specific quantities and frequencies” (Pre-intervention FGD male, Y35).

Misconceptions about the healthiness of some food items were also commonly identified. Some female participants reported that meals containing groundnut products are not healthy:

“TZ with dry okro soup or kuuka is a healthy food but the dry okro soup should be cooked without groundnut. When you add groundnut paste to dry okro, it makes it unhealthy because it causes diarrhoea” (Pre-intervention IDI, Y10).

A male participant endorsed the perception of groundnut as an unhealthy food:

“Groundnut was never known in our culture as healthy for women who are pregnant or lactating...eating it didn’t facilitate proper development of the child ... that’s why our children aren’t growing well these days” (Pre intervention FGD men, Y35).

Community food preferences

Although foods produced in the communities were perceived to be healthy, community members at both Yilkpene and Kpachilo had preferences for certain foods (based on their perceptions of the foods). Table 4.3 shows a free-listing of food preferences across different categories of community members.

Table 4.3: Foods preferred and less preferred by communities at baseline

Categories of participants	Preferred foods
Men, women and adolescent girls	Dishes prepared with tubers such as yam and cocoyam Plantain Livestock products Vegetables and fruit including “kontomire”, banana, oranges, pear and apple
Men and women:	Dishes prepared with cereals such as maize, guinea-corn and rice -Dishes prepared with cow- and pigeon-peas and bambara bean
Women and adolescent girls	Dishes prepared with rice and cow-pea Sugar-sweetened beverages such as Lipton tea; cocoa-drink, milo and soft drinks
Women	Soya bean Less preferred foods
Men and adolescent girls	Soya bean Orange-flesh sweet potato
Adolescent girls	Pigeon-pea Nabinchingli (cocktail of different cereals and legumes) Cassava
Men	Bouillon cubes (magi)

Table 4.3 indicates that men and women prefer meals made from cereals (maize, guinea-corn, rice and millet) and legumes (cow-and pigeon-peas and bambara beans). In addition, the women prefer soya-bean and beverages such as tea and milo while the adolescent girls prefer foods such as tubers, rice, cow-pea and sugar sweetened beverages. The lists of preferred foods for the two study communities were identical at baseline.

Reasons for food preferences:

Participants gave a number of reasons for their preferences. Meals prepared from maize, millet and guinea-corn are preferred because of their availability and perceived energy-density – that is, giving a full feeling over a long period after consumption. Women prefer soya bean because it can be used to prepare a variety of foods. Tea and chocolate drink are preferred by women because they are perceived to enhance production of breast-milk. Some men and adolescent girls, on the contrary, dislike soya bean because of its perceived association with stroke, stomach pain, diarrhoea, nausea and high blood pressure. Men dislike bouillon cubes because of their perceived association with male sexual dysfunction.

4.2.2.5 Perceptions on nutritional adequacy of women's diets

Some women in both communities perceived the foods they consume as adequate in terms of their quantity and quality. They indicated that the foods they consume meet their dietary needs because they are filling and healthy. Satisfaction with TZ was attributed to its status as the main local food:

For us in the village, our main food is TZ; so when you wake up and get your TZ to eat, then you're satisfied" (Pre-intervention IDI K35).

The lack of meat in women's diets was not perceived to have any negative effect on their nutritional adequacy as indicated by a female in-depth interviewee at Kpachilo:

"Though we don't add meat, we always add a lot of anchovies. We also cook vegetable soup to go with the TZ so our diets are of good quality in terms of nutrients" (Pre-intervention IDI K12).

Satisfaction with the nutritional adequacy of locally-produced foods was another reason for one woman's positive perception of their diets:

I think that so far as we're able to keep healthy by eating the foods we produce, I'll say our diets give us all the nutrients we need to stay healthy" (Pre-intervention IDI Y34).

On the contrary, other women and some men perceived the quality of women's diets to be inadequate. They indicated that women and other members of their households consumed foods from a limited variety in their meals. One woman painted a picture of despondency in respect of the inadequacy of meat and fish in their meals:

"I think the nutrient content could be improved with meat and more fish but, as it is, we can manage" (Pre-intervention IDI, K15b).

The need to make the best out of a seemingly helpless situation was said to be responsible for the monotony in women's diets:

"The only thing is that these days foods like beans, yam and groundnut don't grow well because of poor rains. So we don't have enough of variety in our homes to cook with all the time. What we tend to eat more is TZ because we cultivate more of maize and manage it throughout the season" (Pre-intervention IDI, Y34).

The perception held by some participants that most women's diets were poor in terms of quality was emphasized by all key informants and most FGD participants during the community readiness assessment at Yilkpene. Participants opined that, even though they perceived women's and other household members' diets to be sub-optimal, there was very little they could do about the situation.

From the above interaction with participants, the problem of women's poor diets do not seem to be apparent to most participants in the two communities. First, participants linked women's poor dietary quality with the periodic shortage of food (food insecurity) and not the socio-cultural aspects of the food system and community practices. They explained that food shortage led to the consumption of monotonous and unpalatable

meals and the tendency to consume foods merely to satisfy hunger and not because of their nutritive benefits. As a result, women's diets tended to be poor in quality.

Second, most participants linked the effects of women's poor diets to their physical and psychological health as well as high cost of health-care but not to their reproductive health outcomes. Participants perceived that when women do not get quality food to eat, they tend to lose weight and their beauty. Women may also become ill and lack the strength to carry out their daily chores including the care of other members of the household, particularly children. The difficulties result in women becoming worried as found in the following narrative by a female key informant:

"It worries us because if the children need food and there's none, definitely, as a woman, you'll think a lot about it and sometimes even cry secretly but what can we do? We just manage with the little we have" (Pre-intervention KII Y21).

Another key informant emphasized the negative effect of women's poor diets on peace in their households:

"It's just the peace because without peace of mind at home, everything becomes bad (...). Yes, when a woman has no ingredients to prepare food, it disturbs her and she keeps on worrying" (Pre-intervention KII, K21).

Participants perceived that women's poor diets could lead to high cost of health-care as a result of ill health. Only a few key informants from Yilkpene perceived women's poor dietary status as having negative effects on their reproductive health outcomes.

4.2.2.7 Community members' beliefs about foods (taboos and restrictions)

Some gender dynamics were evident in beliefs about food, which to a large extent, impeded women's access to optimal diets in the communities. Two main types of food restrictions were identified from participants' accounts. While some restrictions were

general and affected the entire community, particularly women, others were specific to women's physiological statuses- that is, during pregnancy and lactation. Table 4.4 presents a list of food taboos and restrictions affecting Kpachilo and Yilkpene at baseline.

Table 4. 4: Food taboos and restrictions at baseline at Kpachilo and Yilkpene

Target of food restriction	Restricted food	Reason for adherence
Entire community	Meat of pig, dog, frog	Religious requirement-Islamic taboos
All women of reproductive age	Python, dear, donkey, mud-fish, rat, crocodile, alligator, cat	Superstitious belief that children born of women who consume the flesh of such animals will give birth to children with resemblance in character to the animals
Pregnant women	Wild animals such as grasscutter, wild fowl ("yonoo") and guinea-fowl (yokpang")	Baby may resemble animal and actually exhibit animal behaviour
	Cassava –based foods such as "gari, and "kontonte"	Reduced body fluid and blood
	Salty foods	Make legs swell (oedema of the feet)
	Mango	Stomach pains in woman, itchy and reddish anus in unborn child
	Sugary and other sweet foods	Difficult delivery and convulsion when baby is born
	Egg	Children born are destined to become thieves
	Honey	Causes stomachache and premature delivery
	Soya bean and pigeon-pea ("adua")	Cause stroke in pregnancy
Lactating women	Oily and cold foods	Cause nausea
	Green leafy vegetables and slimy foods such as okra, ayoyo and kuka	Prevent healing of the womb and male child's circumcised penis
	Oily and chewable foods such as rice and stew, jollof rice, waakye, adua, nyonbeka (mix of grains and green leafy vegetables) and "nabinchingli" (mixture of cereals and beans);	Not allow healing of the womb, cause stomach pains and do not facilitate production of breast-milk
	Sugary and sweet foods	Cause nausea and stomach pains
	Dawadawa, mango and shea fruits	Disturb baby's stomach after breastfeeding
	Raw groundnut	Itchy and reddish anus and passing of greenish stools by babies
Adolescent girls	Fish head and palm kernel	Enlargement of stomach wounds
		Causes candidiasis

Basically, there were no differences in the range of taboos and restrictions at baseline in the two communities. The consumption of the flesh of the pig, dog and frog was considered a taboo in the communities - thereby affecting all community members regardless of age or sex. The Islamic faith considers the consumption of pork a taboo because the pig is regarded as a sacred animal among Moslems. The dog, on the contrary, is considered a totem among the Dagomba tribe while the flesh of the frog is perceived to be poisonous.

The consumption of the flesh of other animals such as the python, deer, cat, rat, monkey, crocodile, alligator and certain varieties of mud-fish (“zamasugu”) is considered a taboo for all women of reproductive age. All participants believe that consuming such flesh tends to negatively affect the behaviour of any children born subsequent to the consumption by their mothers: Female FGD participants in Kpachilo enumerated a number of animal source foods that were taboos in the community:

“There are, however, animals like the crocodile and snake the flesh of which women don’t eat in this community but which men eat. There’re also the “woa” and “yogu” (alligator)- the flesh of which pregnant women are forbidden to eat because they’ve holes in the ears so when a woman is fond of eating them and she gives birth to a baby, it’ll have a similar hole in the body. We also have “zamazogu” (mud-fish) which lives in water and that one too, a pregnant woman is not supposed to eat its flesh because if she eats it and gives birth to a baby, it’ll always be puffing like the fish” (Pre-intervention FGD, women, K30).

Restrictions on consumption of some animal- and plant-source foods were confined to pregnant and lactating women. Protection of both mother and the unborn child from harm was the main reason for the restrictions. Community-level beliefs in food taboos and other food restrictions was found to be high at both Kpachilo and Yilkpene at baseline because most of them were perceived to be part of their traditions:

“Yes, we still adhere to these taboos even today (...). We adhere to them because they’re part of our Dagomba culture and we don’t want our children to exhibit such animal tendencies” (Pre-intervention FGD women, Y22).

Similarly, participants in Kpachilo confirmed the adherence to taboos in their community as well:

“Yes, because they’re part of our belief system. If you don’t abide by them and you encounter any problem, you have yourself to blame” (Pre-intervention FGD women K30).

It was further revealed that participants were unwilling to relax some of the food taboos affecting women of reproductive age. The reason for the unwillingness was based on superstition - the belief that the taboos were meant to prevent the development of aggressive animal tendencies in their children (superstition):

“No, we won’t allow the women to stop adhering to such taboos (...). There’s very little one can do about a tradition that’s been handed down to us..... In any case, why should we encourage the development of animal behaviour in our children?(...). Madam, there are certain cultural practices that protect us from harm and some of them are these taboos women are supposed to adhere to. If our women refuse to adhere to them, then you can imagine the kind of children we’ll be giving birth to” (Pre-intervention FGD males, Y35).

Subsequent discussion with a key informant confirmed that, even though some individuals in the communities did not adhere to some of the taboos, other community members did so. Adherence to food taboos and food restrictions among women, especially during pregnancy and lactation, was perceived by a few male key informants at Yilkpene to limit the variety of foods available to women. For instance, restrictions against the consumption of pigeon-pea, wild animals or bush meat, chewable foods, some fruits and especially green-leafy vegetables by pregnant and lactating women were perceived to limit the variety of food items available to them:

“It means she’ll have only one kind of food to eat and beside this, it can happen that she’ll be fed up with that soup and that means her food intake will decrease and that can harm her health. If you eat a particular soup in the morning, afternoon and evening, then, the next day, you’re given the same soup again, you won’t be able to consume the food as much as you did the previous day and that alone is harmful to women’s health. Apart from the woman becoming fed up with the food, she won’t get the benefits the consumption of vegetables can bring to her health because she doesn’t consume them” (Pre-intervention KII, Y41).

Most participants including all the females at Yilkpene and all participants at Kpachilo, however, did not think that food taboos and restrictions had any negative impact on women’s diets. Their main reason was that most of the animal-source taboos did not form part of their everyday diets and, therefore, restricting their consumption among WRAs did not pose a threat to women’s diets:

“You see, let’s talk about the snake; it can happen that for about five years or more, in this community no one would have killed a python. So it isn’t that we even have those animals in the community these days. They’re no longer there (...). As we hunt them they also run for their lives and so they’re no more there. We don’t even have them anymore to eat and for that matter, there’s no effect” (Pre-intervention FGD men, Y31).

4.2.3 Women’s dietary practices

4.2.3.1 Women’s eating pattern and dietary diversity

In the two communities, women’s diets are essentially not different from those of the entire household. The diets consist mainly of grain-based foods. Tuo-Zaafi (TZ) and a variety of porridges usually made from maize and guinea-corn are the main staple foods. TZ is usually accompanied with green-leafy vegetable soups in which anchovies are a common feature. Groundnut is also consumed quite frequently. Legume-based foods are consumed when in season but meat and fruits are less frequently consumed.

Some women reported consuming beverages and a variety of porridges in the early morning followed by mid-morning, afternoon and evening meals. The early-morning

meal usually consists of Lipton tea with sugar and sometimes with milk, chocolate or milo drink, a variety of porridges made from cereals (“koko sali”, “zimbuli”, “kokonyina” and “kanwa koko”) and sometimes consumed with roasted groundnut or wheat bread. The mid-morning meal, traditionally referred to as the “nagban suli” (meaning breaking of a fast), usually includes dishes prepared from rice, cow- and pigeon-peas and yam. Sometimes left-over TZ from the previous night may be consumed. The afternoon and evening meals are mainly TZ with a variety of vegetable soups. Table 4.5 presents the frequency of meals consumed by the 40 women at Yilkpene and Kpachilo in May-June 2016 (perceived period of food shortage) and November 2016 (perceived period of food availability).

Table 4. 5: Frequency of meals at baseline

Freq. of meals	Yilkpene May/June 2016	November 2016	Kpachilo May/June 2016	November 2016
Less than three	0	0	2 (10%)	0
Three	3 (15%)	8 (40%)	6 (30%)	9 (45%)
Four or more	17 (85%)	12 (60%)	12 (60%)	11 (55%)
No.	20	20	20 (100%)	20
Total frequency	81	73	72	75
Mean frequency	4.01	3.65	3.6	3.75

Majority of women at Yilkpene and Kpachilo consumed four or more meals during the two periods of data collection at baseline. Eighty-five percent of women at Yilkpene consumed four or more meals during the period of May/June 2016 while 60% at Kpachilo did so in the same period. The proportion of women consuming four or more meals in November 2016, when food was perceived to be more available, was lower in both communities (Yilkpene-60% and Kpachilo-55%) compared to the period May-June 2016. The mean frequency of meals consumed at Yilkpene in May-June was higher (4.01) than that at Kpachilo (3.6) for the same period.

Although purchase of ready-to-eat foods (RTE) is uncommon, some women reported eating RTE foods while at the market or attending social functions. The foods most likely to be purchased were “kenkey” with pepper sauce, “waakye” (rice and beans), bread and fried pastries. At social functions such as funerals and naming ceremonies, Tuo-Zaafi and soups may be served with meat.

Presented in Table 4.6 is a breakdown of the Minimum Dietary Diversity of women (MDD-W) at Yilkpene and Kpachilo in May-June and November 2016 at baseline.

Table 4. 6: Minimum Dietary Diversity of Women (MDD-W) at Yilkpene and Kpachilo in May-June and November 2016 at baseline

MDD-W	Yilkpene		Kpachilo	
	May/June (N=20) 2016	November (N=20) 2016	May/June (N=20) 2016	November (N=20) 2016
Yes	11 (55%)	13 (65%)	11 (55%)	16 (80%)
No	9 (45%)	7 (35%)	9 (45%)	4 (20%)
Average DDS	4.45	5.1	4.6	5.1

Note: MDD- W –Minimum Dietary Diversity of Women (Foods belonging to five and more groups consumed).

Yes- Number or percentage of women scoring five or more food groups (or meeting the minimum dietary diversity score).

No-Number or percentage of women scoring less than 5 food groups (or not meeting the minimum dietary diversity score).

Average DDS - Mean Dietary Diversity Score of women surveyed

About half (55%) of women reported achieving the minimum dietary diversity score of five good groups or more in the period May-June 2016. In the baseline period of November, however, a higher proportion of women in both communities met the MDD-W (Yilkpene -65% and Kpachilo - 80%). The gap between the scores for the two periods was, however, higher at Kpachilo (25%) than Yilkpene (10%). The mean dietary diversity score (DDS) for Kpachilo was higher than that for Yilkpene in respect of the

baseline period May-June 2016 (4.6 as compared to 4.45 respectively) though both communities had a mean DDS of 5.1 in respect of the baseline period of November 2016.

4.2.4 Drivers of women's dietary choices

Seven main drivers of women's dietary choices emerged from the various discussions with community members. The identified drivers are household food security, tastes of food, women's physiological status (e.g. pregnancy), perceived healthiness of food, food restrictions, sources of information on diets and large sizes of households.

Figure 4.1 presents the seven emerging themes on what drives women's dietary choices at Yilkpene and Kpachilo in northern Ghana. The seven drivers of women's dietary choices were observed and concluded from the participants' accounts.

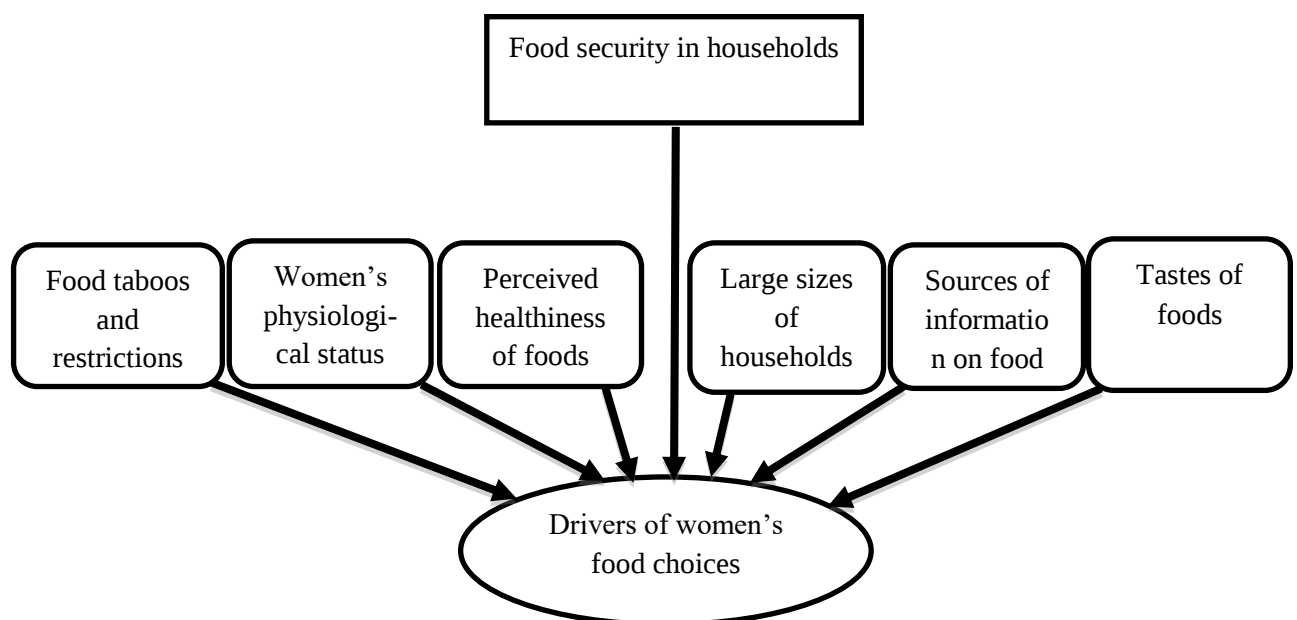


Figure 4.1: Drivers of women's dietary choices

Food security: Food security at the household level was identified as one of the major drivers of women's food choices through availability and cost of food, food preferences,

food safety and offer of gifts of food in the communities. Availability of food was affected by seasonality, climate change and availability of farming inputs. In the opinion of female focus group discussion participants at Kpachilo, their diets tend to be dominated by maize-based products such as TZ because that is the crop produced mostly in the community:

“The only thing is that these days foods like beans groundnuts and yam don’t grow well because of poor rains. So we don’t have enough of these in our homes to be cooking all the time. What we tend to eat more is the TZ because we cultivate maize more and even if the rains are poor, we still manage to get enough to last till the next farming season” (Pre intervention FGD, women K34).

Foods that were relatively affordable were more likely to be purchased and consumed. Examples of such foods were anchovies (fish) which were consumed daily because they were affordable animal-source food, tea, sugar and tinned tomato in small sachets. Incomes of households relative to prices of foods determine their scopes of affordability/accessibility. The issue of cost was raised in relation to the consumption of anchovies compared to meat by female participants:

“Usually we don’t cook with meat. It’s mainly yurayura (fish) we buy and pound. Fish is much cheaper than meat. Can you imagine making all those expenses to cook a meal and in addition buying meat to add to the food? No madam, it’s too much for us women. We can manage to make the food taste nice and eatable without meat. It’s too expensive for us” (Pre intervention FGD women Y34).

Women reported that the food preferences of other members of their households influenced their choices of food. Some women reported that their husbands did not like soups prepared with some varieties of green-leafy vegetables such as cassava and bean leaves as well as soya bean products - thus, limiting their consumption of such foods in their households. In respect of men’s food preferences, a male FGD participant

confirmed women's assertion about men's aversion for green-leafy vegetables and the reason why less time was devoted to cultivating them:

"Madam, one reason is that green-leafy vegetables aren't our favourite soups. But as for okro, we can eat it on a daily basis and never get fed up with it. That's why we cultivate okro in large quantities and care less about green-leafy vegetables" (Pre intervention FGD, Men Y31).

Participants were very concerned about issues of safety regarding their farm produce particularly the use of agro-chemicals in the production of fruits and vegetables. For instance, as a result of the use of chemicals to facilitate the quick ripening of tomato in particular, most women reported resorting to using processed tomato preserved in sachets in place of the fresh ones even when the latter was in season. Similarly, women were concerned about infestation of their farm produce by insects (weevils) that they considered unsafe for consumption. In respect of using agro-chemical on tomato crops, a female participant explained her preference for processed and package tomato from the market:

"...they spray the chemicals on okro and tomato and because of that, most of us fall sick. It's now very difficult to cook with them. So you see, as we sit now, we use tinned tomato to cook our foods because fresh tomato this time contains chemicals" (Pre intervention. FGD women Y32).

The practice of making food available through the generosity of food donors within the community was a common practice. Households that were better off in terms of the availability of food donated food to vulnerable households and individuals:

"If you bring the food home after harvesting it, you have to give some to the chief of the community, your Imam and, sometimes too you, could also give to the aged in the community" (Pre-intervention KII male, K22).

Taste of food: The second set of drivers of women's dietary choices was the tastes of food. Anchovies and bouillon cubes were commonly consumed because they were

perceived to enhance the tastes of meals. A female key informant explained why the use of anchovies and bouillon cubes was common in the communities:

“We also add fish to our food to make it taste good but we don’t have any river here. We use magi although they say it isn’t good but it makes our food tasty and so we still use it” (Pre-intervention KII, Female k25).

The consumption of beverages and sugar by the adolescent girls was influenced by their good tastes.

“We like tea and milo because they taste nice and they help women to produce a lot of breast-milk for the children to suck. So lactating women too like them” (Pre-intervention. FGD with adolescent girls, K31).

Women’s physiological status: The third driver was women’s physiological status. A number of lactating women reported consuming beverages such as tea and chocolate drink with sugar and sometimes milk because they were believed to enhance production of breast-milk. Similarly, pregnant women indicated their aversions to certain foods which were perceived to cause nausea and vomiting and their cravings for other foods (the consumption of pica).

Perceived healthiness of foods: The fourth driver was the health-conferring ability of foods. Foods prepared from maize, millet, guinea-corn, fish, meat and vegetables were perceived as foods that were healthy and, therefore, consumed more frequently. The foods were perceived to give energy, strength, blood, induced drinking of a lot of water and profuse sweating and enhanced health in general. In respect of dawadawa, which forms part of their everyday meals, an FGD participant enumerated its perceived healthiness:

“Well if there’s no dawadawa in the soup, we don’t even feel like eating the food because the taste won’t be nice and it’s also not considered healthy enough... So we never run short of dawadawa. Dawadawa has some health benefits such as

giving blood. Some time ago, you could just make dawadawa solution and eat your TZ with it without adding anything and that was healthy” (Pre intervention FGD women, Y34).

Food taboos and restrictions: The fifth driver was adherence to food taboos and restrictions, which emanate from tradition or religion of a people. Restricting women and other categories of people from the consumption of some animal- and plant-source foods limited the availability of a variety of foods in their diets. Restricting lactating women from consuming slimy, green-leafy vegetables, mango and other wild fruits, for instance, deprived them of their protective properties. One key informant stressed the influence of food taboos, whether traditional or religious, in determining and actually limiting the availability of animal-source foods for members of the community.

“Added to these factors is the role of religion. Our setting here is more of Islamic influence, whereby certain foods aren’t consumed among us just because of religious reasons. For instance, the snail isn’t eaten in this part of the country and neither are some kinds of bush meat our men go to hunt. Hunting is very common here but more often than not, the catch is sold for cash partly because some of the animals they hunt aren’t consumed by our people because they’re taboos. Otherwise, the catch from the bush would’ve been a good source of proteins since the animals we rear are meant for cash and not for home consumption” (Pre intervention KII).

Sources of information on food: Sixth, the kinds of information received about diets from women’s sources of dietary information influenced their choices of foods. Women reported being encouraged by health professionals to consume some categories of foods such as eggs, beans and vegetables to enhance their health statuses:

“Ok, when we go to the hospital, we’re always told to eat a lot of vegetables like ayoyo, alefu, and bra. We’re also told to eat a lot of amani and dwadawa and prepare the foods under hygienic conditions so that when the children eat, they and the women will be healthy” (Pre-intervention FGD women, k30).

Large sizes of households: Finally, some key informants indicated that large sizes of households in the communities were barriers to access to food owing to their low

incomes and communal system of eating. A key informant reiterated how the large sizes of households in the communities limit their ability to consume adequate nutritious foods:

“I think it’s more of survival than getting quality food to eat. Again, the extended family system isn’t helpful here. How much meat can a household afford to feed its members who are over 30 people for a single meal? It’s impossible. If the sizes of the households were smaller, between 4 and 5 or so, then once a while, they may be able to buy meat to cook. But with huge members like these, how can they afford it especially when the man provides only the grains and the woman is expected to provide the ingredients for soup - when she has no meaningful source of income” (Pre intervention KII).

4.2.5 Community readiness to address challenges to women’s diets

Having understood women’s dietary practices and the context that influenced them, it was necessary to assess Yilkpene, the intervention community’s, readiness for an intervention targeted at socio-cultural barriers to women’s diets as a pre-condition for its effectiveness (Stanley, 2014; Findholt, 2007; Edwards et al., 2000). The readiness was assessed by six key informants and participants in four focus group discussion sessions in the community and measured on five dimensions (Stanley 2014).

The distribution of community readiness scores awarded by the six key informants on the basis of the 5 dimensions of the community readiness model (CRM) is presented in Table 4.7.

Table 4. 7: Community readiness scores obtained from key informants

Dimensions	Key informants (N=6)						Total score	Mean score	Stage of readiness
	01	02	03	04	05	06			
1. Knowledge of the issue of women's diets	2	6	8	5	5	3	29	4.83	4- Preplanning
2. Knowledge of local efforts addressing challenges to women's diets	2	5	4	5	5	5	26	4.30	4-Preplanning
3. Community climate	2	6	1	3	1	2	15	2.50	2 -Denial/resistance
4. Leadership	1	4	8	1	1	2	17	2.83	2- Denial/resistance
5. Resources	3	3	5	1	1	5	18	3.0	3- Vague awareness
Total score	10	24	26	15	13	17	105	3.5	(105/(6x5))= (105/30)=3.5
Mean score	2.0	4.8	5.2	3.0	2.6	3.4	21	3.5	(21/6)=3.5
Overall stage of readiness									3 – Vague awareness

The overall mean readiness score for Yilkpene was 3.5, which corresponds to the third lowest of the nine stages of community readiness - the stage of vague awareness. At this stage, community members had begun to recognize the existence of the problem of women's diets but they lacked the motivation to do anything about it.

4.2.5.1 Knowledge of women's sub-optimal diets

The readiness score for knowledge of the issue of women's poor dietary quality was low but above the overall mean score (4.83 compared with 3.5). The score of 4.83 suggests that community members including some key informants had limited knowledge about the issue of women's poor diets.

4.2.5.2 Community knowledge of efforts addressing challenges to women's diets

The readiness score for knowledge of community efforts (that is, knowledge of the programmes and policies in place to address the issue of women's poor dietary qualities)

was low (4.3). Some community members reported efforts to address women's poor diets but knew little about them. The media, particularly radio, was the only local effort reported by participants which aimed at promoting activities related to diets in pregnancy:

“Zaa Radio usually tells us about good eating habits for pregnant women and for the community” (CRM, Y03, women).

Other activities of Ghana Health Service, Resilience in Northern Ghana (RING) project and the media were mentioned as efforts at addressing the challenges pertaining to the knowledge aspects of women's diets. Ante-natal and child welfare services, promotion of good sanitation practices and use of insecticide-treated nets also provided knowledge services:

“The health workers do come around and they talk to us on what a pregnant woman should eat, do and not do. They said a pregnant woman shouldn't overwork herself and that we should try and get rest during our working sessions” (CRM Y03, women).

RING assisted the community with farming inputs such as seeds, cutlasses and boots as well as sacks and silos for storing grains. Additionally, each woman with farmland was assisted to plough an acre. Participants were, however, of the view that coverage of such activities was limited for they were targeted mostly at women with children and pregnant women. A woman felt dissatisfied with the limited coverage of Ghana Health Service's activities in respect of their focus on only women with young children:

“Honestly, when the hospital workers come, they gather pregnant women and those with little children to talk to them; they usually don't include some of us” (CRM, Y03, women).

Paradoxically, a male key informant defended the concentration of activities on women with children and pregnant women:

“But when they come here, their focus is always on the women with children because it’s the women who take care of us all” (CRM, Y04, men).

Participants’ impressions about the various efforts in the community aimed at improving women’s diets were positive. They explained that the “adakabila” (a savings scheme) programme, for instance, was helpful in improving women’s financial situation. All the other programmes in the community including those of Ghana Health Service were considered useful but had limited coverage. Members of the community, therefore, suggested that future intervention activities should target men and other members of the community as well:

“They should involve the husbands too and even the children especially the adolescent boys and girls because they have the brains to do something” (CRM, Y11, KII).

4.2.5.3 Community climate regarding women’s sub-optimal diets

The score for community climate – that is, the prevailing attitude of the residents of Yilkpene towards women’s poor diets – was the lowest among the five scores (2.5) and, thus, fell far below the overall mean of 3.5. The score suggested that residents of Yilkpene believed that the issue of women’s poor diets was either not a concern in their community or an issue that could not be addressed. In contrast, focus group discussion participants wished something could be done about the situation. Two female focus group discussion participants echoed the dismal assessment of women’s diets, wishing something could be done to improve their helpless situation:

“It’s a heartache to us and we wish something could be done about it (CRM FGD Y03, women).

Another female key informant supported the view that there was nothing they could do about their current situation regarding their diets:

“Yes, we know but we’re at our wits’ end” (CRM, FGD Y05, women).

Further probing by the research team to fully understand what they meant by “something could be done about it” led one male participant to refer to the poor status of preservation of farm produce - an important determinant of women’s poor dietary quality:

“We’re supposed to preserve our harvests well so that there won’t be insect infestation” (CRM FGD Y14, men).

Some of the activities they wished to be implemented included provision of income-generating activities, loans, agricultural extension services and a dam to produce water to irrigate their crops during the dry season. The dam would also address their acute domestic water situation.

4.2.5.4 Community leadership

The readiness score for leadership was low (2.83) so the members of the community were not spurred to carry out activities related to women’s diets. There was consensus among male and female focus group discussion participants that community leaders were supportive of interventions aimed at addressing some issues related to women’s diets. A few key informants, however, felt otherwise and indicated that community leaders (chiefs and elders) were not doing much to support efforts in the community:

“They (the community elders) are happy about our (GHS) efforts but the support is zero because at most durbars organized by us, we don’t see them. Some of the community leaders don’t come for the durbars” (CRM Y10, KII).

Only one key informant was quite satisfied with leadership support and scored it highly (8) to agree with the focus group discussion participants’ views. FGD participants who maintained that community leadership were in support of programmes targeted at

challenges to women's diets indicated that leadership showed their support by welcoming interventionists into the community, mobilising the community for outreach activities, encouraging community members to participate in activities and, occasionally, meeting with community health volunteers to assess progress of intervention activities. Female FGD participants recounted the support shown by their community leaders in the following narratives:

"They always mobilize us for such activities. Sometimes even if we're on the farms, they send for us to come and that tells us they've interest in the activities. They also go round and write our names if there's the need for that" (CRM FGD, 05, women).

Another female participant added:

"The chief and other community leaders show they're in support by welcoming the people warmly and asking the community to co-operate with them. If the people even want people to train, the community leaders do assist them in selecting those people. If they aren't in support of whatever activities are going on in the community, then they won't even mind you" (CRM FGD 02, women).

4.2.5.5 Community resources

The readiness score for resources was low (3.0) indicating there were limited resources to address women's poor diets. Key informants were unanimous about the inability of Yilkpene to support activities to address barriers to women's diets since they lacked financial resources for such activities. A key informant indicated that the community as a whole lacked financial resources dedicated to addressing women's dietary challenges:

"We've no financial resources to devote to address this issue except our time and prayers. We'll always be there to listen to what they bring to us" (CRM KII 08).

Both focus group participants and key informants indicated that the community was able to sustain the "adakabila" project for the past two years because of individual women's contributions into the pool. Participants stated that they could make similar contributions

towards similar projects to enhance women's diets if called upon to do so. One key informant indicated community members' willingness to make communal financial contributions towards activities aimed at addressing challenges to women's diets. He cited an instance in which the community made some financial commitment towards building a pen for keeping livestock before receiving assistance from an NGO:

“When the RING people were coming here, they selected 38 households and each received three sheep. Before you take the sheep, you have to build their pens and for you to do that means that you have to spend money” (CRM KII Y11,).

Even though the key informants indicated insufficiency of personnel to carry out health programmes in the community, data from the focus group discussion sessions revealed that the community had people who could be trained to deliver the required services. They mentioned community volunteers and other persons who were available to engage in activities to address issues related to women's diets. They indicated that the community volunteers had received a lot of training and were in a position to carry out the intervention activities in the community. Participants mentioned “Amasachina” Group (women's group), “Ataya” (Male youth group which also doubled as the sanitation group) and the local drama group as local groups that could be used to further women's dietary activities.

The Infant and Young Child Feeding Mother Support Group, traditional birth attendants, School Health Teachers and Agricultural Extension Services Division of MOFA were also mentioned as potential groups to be used to further women's dietary activities. Ghana Health Service's monthly outreach programme was the most notable action mentioned. Participants stated that outreach programmes were organized once every month for pregnant women and women with children less than 5 years old in the

community. A female participant emphasized the outreach activities of Ghana Health Service:

“Usually, when the hospital workers come, they gather pregnant women and those with little children to talk to; they usually don’t include some of us” (CRM FGD 03, women).

Finally, the community mentioned land and nutritious food crops as resources available to enhance efforts aimed at addressing issues related to women’s diets:

“We don’t have anything but we can give out our lands so that, they’ll help us cultivate our vegetables. We also have foodstuffs like soya bean, livestock, maize, yam and millet” (CRM FGD 04, men).

Results of the community readiness assessment showed that the overall readiness of Yilkpene for an intervention aimed at addressing socio-cultural barriers to women’s diets was low - an indication that, even though some community members were aware of women’s dietary challenges, very little community efforts were in place to address the situation. In spite of this limitation, Yilkpene was endowed with human resources to implement an intervention to address the situation. Additionally, existing structures such as the monthly health and nutrition outreach activities of Ghana Health Service in the community, the community health volunteers and community venues for community meetings were some of the resources that could be utilized to carry out sustainable interventions in the community.

4.2.6 Description of implementation of intervention

An intervention was implemented at Yilkpene to address the challenges to women’s diets identified earlier in the baseline phase of the study. This section presents results of the community exposure to the intervention (its coverage) and the modification and adaptations of the original plan of the intervention.

4.2.6.1 Exposure to intervention activities

The data presented in Table 4.8 gives a break-down of the levels of dosage or exposure to group meetings by community members (i.e., frequency of participation in the group discussions).

Table 4. 8: Frequency of participation in group meetings

(a) Frequency of participation in group meetings	Groups				Total	
	Men		Women		(f) Attendance at group meetings	(g) Aggregate attendance
	(b) No.	(c) Aggregate attendance (axb)	(d) No.	(e) Aggregate attendance (axd)		
12	7	84	18	216	25 (10.9%)	300
11	4	44	6	66	10 (4.3%)	110
10	0	0	3	30	3 (1.3%)	30
9	3	27	8	72	11 (4.8%)	99
8	7	56	29	232	36 (15.7%)	288
7	15	105	19	133	34 (14.8%)	238
6	20	120	16	96	36 (15.7%)	216
5	20	100	25	125	45 (19.6%)	225
4	9	36	10	40	19 (8.2%)	76
3	6	18	4	12	10 (4.3%)	30
Total	91	590	138	1, 022	229	1, 612
Mean Attendance	-	6.5	-	7.4	-	7

Table 4.8 shows that a total of 229 persons (138 women and 91 men) attended the weekly group meetings. Eighteen (13%) of the women out of 138 attended all 12 sessions of the group meetings compared to 7 (7.7%) out of 91 men. The least rate of attendance at group meetings was 3. Majority of participants attended between 5 and 8 meetings. The respective mean attendances or dosages were 7.4 for women and 6.5 for men. All the participants had a mean attendance/dosage of 7. The aggregate attendance consisted of the product of a group's frequency of participation in group meetings and the size of the group.

The intervention was intended for all adult members of the community comprising men, women and adolescents girls. Table 4.9 gives a description of adult population participation at group meetings.

Table 4. 9: Coverage of group meetings during implementation

Population category	Population	Total number of group meetings	Proportion at group meetings
Adult males	273	91	33.3%
Adult females (including adolescent girls)	329	138	41.9%
Total adults	602	229	38%

The adult population of Yilkpene at the time of the intervention was 602 (273 men and 329 women including adolescent girls). Less than half (38%) of the target population consisting of 33% men and 42% women was reached. While the first durbar recorded 265 participants (101 men, 151 women and 13 adolescent girls), the second recorded 174 adults (102 women and 72 men). The first food demonstration session (training on post-harvest losses) recorded an attendance of 203 (121 women and 82 men) but the cooking demonstration a total of 176 (115 women and 61 men). The adolescent girls were, however, not reached as desired (only 13) because most of them had migrated to the southern part of the country to work as porters. Each compound was visited at least once during the intervention and at least one member of each of 55 out of the 56 compounds or households was reached with the messages.

4.2.6.2 Modification and adaptation of initial plan of implementation

The initial plan of implementation and the actual plan that was executed are presented in Appendices L and M. In the initial plan, the stakeholders' meeting and the training sessions were to be held for two days each while the other activities were to be held

weekly but owing to community requests, some modifications were made to it (Appendix L) resulting in an extension of the duration of intervention activities from 12 to 17 weeks (Appendix M). For instance, minor modifications were made to the food demonstration sessions so that one session concentrated on post-harvest and food preservation methods but the other on cooking demonstration of local dishes fortified with soya-bean flour.

This change was made specifically at the request of the men who felt that most of the intervention activities and messages concentrated too much on women. Again, twelve group meetings were held instead of the planned five. This major modification came about because community members made a request for some of the messages to be repeated and also because of reported bottlenecks in respect of men's aversion to consuming some green-leafy vegetables and difficulty in processing fermented grains as well as in accessing a variety of fresh vegetables all year round.

4.3 Post-intervention results

4.3.1 Post intervention changes in community dietary knowledge and attitudes at Yilkpene

At endline, both communities did not change their practices in respect of the food system but Yilkpene was sensitized (raised consciousness) about the gender imbalances in respect of women's limited control over productive and household food resources, appropriate techniques of preservation and storage of food and preferential food allocation arrangements in the community. With respect to the traditional arrangement for sharing meat, for instance, one male FGD participant indicated his awareness of the

need to share food according to need but, at the same time, expressed his reservations about the new practice:

“Normally, the children are given the legs and the heads and women are given the back of the animal while the men and elderly take the thigh and shoulders; we now know that the children and women should be given the soft parts but we can’t do that because if you do that for the children, they’ll grow up to be wayward....Yes, the child may go about killing people’s fowls or stealing them. As a child grows, he’s supposed to go through some training and all this is part of it” (Post-intervention FGD men, Y31).

4.3.1.1 Improved dietary knowledge

Some practical changes were, however, observed in respect of the dietary knowledge and attitudes in both communities. Dietary knowledge regarding the nutritive qualities of locally-produced foods generally improved in both communities at endline. At Endline at Yilkpene, there was a general consensus among focus group discussion participants on the right classification of locally-produced foods into the three food groups: energy-giving, body-building and protective foods. Typical examples were maize, guinea-corn, yam and rice as energy-giving; bamabara beans, pigeon- and cow-peas as body-building and leafy vegetables such as alefu, ayoyo bra and kuka as protective and body-building. The improved level of knowledge in respect of the right classification of foods by men depicted in the following quotation:

“ For instance, there are some foods that build the body, some give energy and strength and others protect our bodies against diseases (...) TZ and fufu give us energy and strength and the fruits protect our bodies and destroy certain diseases in them”(Post-intervention FGD men, Y 29).

Similarly, the following quotation exemplifies women’s improved level of knowledge on the right classification of foods:

“Maize gives us strength to carry out our daily activities (...) and examples of foods that give blood are moringa leaves, ayoyo and the other leafy soups (...) fish builds our bodies and keeps us fit and the fruits protect our bodies against diseases”(Post-intervention FGD, women Y30)

At Kpachilo, however, misclassification of locally produced foods into the food groups persisted among focus group discussion participants. For instance, meals prepared from maize, bambara bean, cow- and pigeon- peas were associated with giving of blood (body-building) and energy; rice and yam with giving energy and groundnut, moringa, sorghum and millet with building the body as some FGD participants recounted. Female participants, during the post-intervention focus group discussions, misclassified some food items:

“Maize, cassava and Bambara beans give us energy...bambara and cow-peas make us healthy... beans give us blood, fufu is very healthy and gives us energy. We also produce guinea-corn and millet and they build our bodies too and moringa leaves prevent malaria” (Post-intervention FGD women, K26).

Endline participants at Kpachilo gave examples of foods that were needed to enhance WRA's health as egg, bean, fruit and vegetables. They also mentioned meals prepared from cow-pea, maize and yam as well as beverages, palm products, fruits and animal-source foods as foods needed specifically by pregnant women. In addition to all the foods listed by participants at Kpachilo as needed by pregnant women, Yilkpene added groundnut paste, hot foods (such as TZ with bra), water and foods prepared with dawadawa. They further indicated that foods needed to enhance adolescent girls' health include cow-pea, leafy vegetables, fish, egg and meat as indicated by a female participant in an FGD:

“They should eat food like beans, alefu and plenty fish and meat. They should eat leafy vegetables” (Post-intervention intervention FGD Women, Y33)

At endline at Kpachilo and Yilkpene, health facilities were rated the main source of information on health and nutrition. Additional sources mentioned were community health workers (volunteers) and health workers engaged in outreach programmes, television and radio:

“We get information on nutrition on radio and television, health centres and hospitals and the outreach health services as well as from sanitation officers” (Post-intervention intervention FGD women Y33).

Kpachilo mentioned non- governmental organizations such as RAINS, World Vision – Ghana and ADRA-Ghana as the other important sources. Face-book and the inter-net were both sources for adolescent female students at Kpachilo. At endline at Yilkpene, the only additional source of information on women’s diets was the intervention team.

4.3.1.2 Changes in dietary perceptions at Yilkpene

At endline, the three additional perceptions of good health mentioned by participants at Yilkpene were all identified by female participants. The first perception was sound nocturnal sleep.

“If you’re able to sleep well at night without any pains and you wake up feeling good, then we can say you’re healthy” (Post-intervention FGD women, Y28 Category 2).

The second additional perception was not being bed-ridden as narrated by another focus group participant:

“I’ll also say that a healthy person is someone who isn’t bed-ridden” (Post-intervention FGD women Y30, Category 1).

The third additional perception was the absence of dizziness:

“If one’s feeling dizzy, then one isn’t healthy” (Post-intervention FGD women, Y33 Category 3).

Participants at Yilkpene identified additional attributes of healthy foods than in both the baseline study and at endline at Kpachilo. Attributes related to the contents of a meal included palm oil and tomato with very little salt and pepper. Orange-flesh sweet potato, soya and bambara beans, groundnut and cow-pea without weevils and holes in them and

vegetables not being overdone were additional attributes mentioned. Attractive colour/look of the food (red-coloured soup being the favourite) and aroma of the soup were other attributes Yilkpene community members considered healthy.

Participants in both communities added that because of the use of chemicals in spraying crops such as tomato and okro, cooking with such vegetables was not healthy:

“Healthy foods are those they don’t spray with chemicals but in our community, this is what they do; they spray the chemicals on vegetables such as okro and tomato and because of that, most of us fall sick” (Post-intervention FGD women, Y28 Category 2).

Furthermore, the use of bouillon cubes in preparing meals was perceived by members of both communities as unhealthy. In the endline study at both Yilkpene and Kpachilo, first, all the foods community members reported as their preferences were the same as those reported at baseline. Second, although the reasons mentioned at baseline for liking specific foods were retained, Yilkpene reported additional reasons. The reasons include the health/nutritive benefits of the foods such as the foods inducing sweating, giving energy/strength and building the body, protection from certain diseases and curative potency. Improvement in male sexual potency was an additional reason mentioned exclusively by male participants.

All the foods cited at baseline as less preferred by some individuals were reaffirmed at Kpachilo at endline; however, two food items mentioned in the baseline that were also cited at Endline at Yilkpene as less preferred, particularly by some men, were soya bean and bouillon cube. Additionally, shea-fruit and the leaves and fruits of a particular baobab tree were mentioned as being disliked by some community members at Yilkpene. Participants at endline at both Kpachilo and Yilkpene, however, stated that they disliked

food crops treated with chemicals that facilitated their quick ripening and made particular reference to tomato. The endline results in respect of food preferences are illustrated in Figure 4.2.

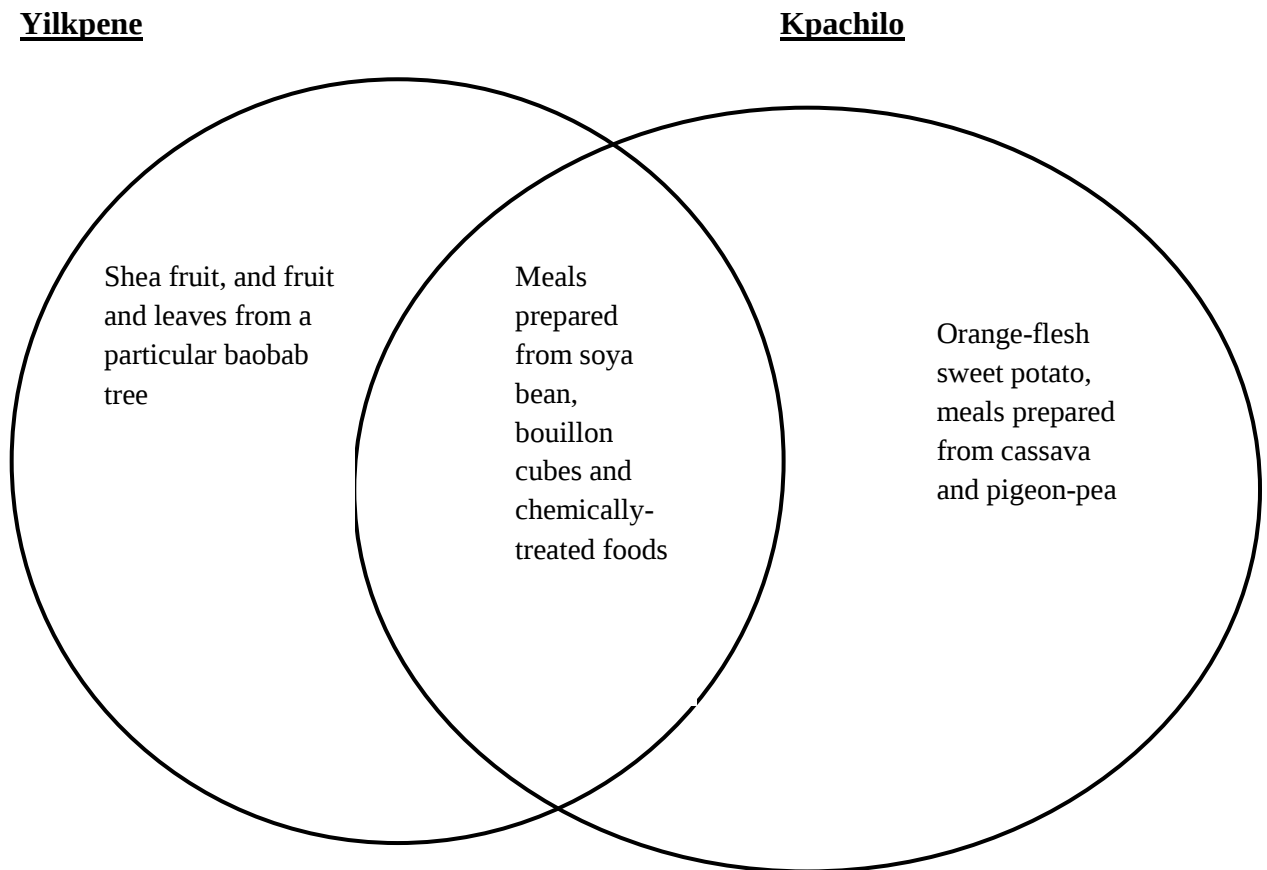


Figure 4.2: Foods less preferred by Yilkpene and Kpachilo at endline

At endline, there was consensus among all categories of participants at Yilkpene that women's diets were inadequate in terms of quality and variety in their meals and linked the poor dietary situation to food insecurity. Male participants lamented that even though they were aware of the inadequacy of household and women's diets, their ability to improve the situation was limited:

"We're aware that the women's food is poor in quality but that's all we have. The food we have is TZ and that's all (...). We've all agreed that our diet and not just that of women isn't the best so we're trying our best but we're limited as to what to do. We plant our crops and the rains aren't that good so it's not easy."

We're doing our best just to improve our women's diets" (Post-intervention FGD men Y31; Category 2).

At Kpachilo, however, divergence still persisted regarding the quality of women's diets. While some participants agreed that women's dietary situation was poor, others believed it was adequate in terms of quality as expressed at baseline.

Participants at Yilkpene identified the harmful effects of women's poor dietary status on women and unborn babies to include passing of bloody stools by women, anaemia in pregnancy (and the associated delayed delivery) and need for blood transfusion for mothers after delivery. Other harmful effects reported were birth of very small (underweight) babies poor health status and insufficient nutrients for the children. One male participant's opinion was as follows:

"Because the women's diet is poor, they tend to eat falinkasa (pica), which makes their stools bloody and makes them unhealthy (...) Poor food for the pregnant woman can lead to anaemia, which isn't good because it can delay birth of the baby. Sometimes, the children are born very small or very sick" (Post-intervention FGD men Y31; Category 2).

A female key informant made a more elaborate assessment of the harmful effects of women's poor dietary status on women and their unborn babies:

"It's important for women's diets to contain a lot of different foods that we produce because they work a lot without rest and all this requires energy. The foods that we produce are very healthy and have specific nutrients the body requires so if the woman's diets don't contain all these foods, which is the case most of the time, then she won't be healthy and as she carries pregnancies and breastfeeds as well, her unborn and lactating children will suffer from deficiencies of nutrients". (Post-intervention KII woman, Y23).

Potential harmful effects of women's poor dietary status on the community were also identified by endline FGD participants at Yilkpene. These effects include population

reduction through maternal and child mortality, expenses on health care for unhealthy mothers at the expense of naming ceremonies and reduced labour force for farming because some members of a household have to sacrifice working on the farm so as to take care of an unhealthy mother:

“Also, if a women is delivered and she isn’t well as a result of poor diets, you’ll have to spend some money to treat her, which would’ve been used to do something else or do the naming ceremony. As for the effects on the community, they are many. We’re in the harvesting season; so if a woman isn’t well, it affects the entire household because someone will have to take care of the sick woman. Also, the little money that you have is used to treat the woman” (Post-intervention FGD men Y31; Category 1).

The male participants further cited another potential harmful potential effect of women’s poor dietary quality on their community as neighbouring communities showing contempt towards the community for their inability to care adequately for their women:

“The other communities around us won’t have respect for us and even sometimes, if we go to those communities to marry, they might refuse us ” (Post-intervention FGD men Y31; Category 1).

4.3.1.3 Modifications to plant-based food restrictions at Yilkpene

At Endline, there were no differences in perceptions about general community food taboos in both communities. Two additional taboo foods identified at Kpachilo were snail and “zanaza TZ”. “Zanaza TZ” is prepared specially for funerals but it is a taboo food for both males and females whose parents are alive. At Yilkpene, gorilla and monkey meat were identified as additional Islamic taboo foods.

At Kpachilo, all food restrictions in respect of plant-based foods reported at baseline for pregnant and lactating women were mentioned again at endline. At Yilkpene, only egg, wild fowl, guinea-fowl and dawadawa fruit were mentioned. Participants at Yilkpene did not report practising some of the restrictions particularly, slimy leafy vegetables for

pregnant and lactating women because there was no evidence of the perceived negative effects of the restricted foods. Additionally, the medical interventions put in place to heal their wombs after child-birth at the health facility, coupled with the messages recalled during the intervention, account for not practising the restrictions for lactating women. A female participant explained why some of the plant-based food restrictions were not being adhered to:

“This is because even if you tell a pregnant or lactating mother not to eat a particular food she won’t listen to you because when she eats it nothing happens to her. I also think it’s because all these beliefs were adhered to back then because our mothers used not to go to the hospital when they were pregnant like we do today. Once you’re pregnant and you start attending ANC you’re given medications until you give birth and even after that you’re given medications to take for some time. These medications can heal all the sores in your stomach after delivery making it possible for you to eat anything without encountering any challenges” (Post-intervention intervention FGD women Y30; Category 1).

Endline participants in both communities attributed adherence to taboos related to animal-source foods targeted specifically at WRA to two main reasons. First, respect for tradition and, second, superstition - that is, fear of giving birth to a baby resembling the specified creatures:

“As for the python and cat, women don’t still consume them because that’s been forbidden since the time of our great-grand-parents (...) and since I was born, I haven’t eaten the flesh of a python or cat because I don’t want to give birth to either” (Post-intervention FGD women, Y28; Category 2).

At endline, participants at Kpachilo perceived food taboos as having no negative effect on women’s diets. At Yilkpene, however, the consensus among participants was that food restrictions affecting pregnant and lactating women did affect the quality of their diets by limiting their choices of a variety of leafy-vegetable in their diets. Female FGD participants in particular were of the view that most animals-source foods women were restricted from consuming were currently rare in their diets and hence, did not

compromise the quality of their diets; however, restricting lactating women in particular from consuming some categories of vegetables may have some effect on their dietary quality:

“Not these kinds of animals like the python. They aren’t even common in the communities and so we don’t add them to our everyday meals. So avoiding them doesn’t have any effect on the quality of our diets and the bush meat too. But speaking of plant-based foods like vegetables, yes, the lactating mothers may be denied their benefits for just a short period”(Post-intervention FGD women, Y28; Category 2).

4.3.1.4 Changes in women’s dietary practices

At endline, the context, pattern, types and frequencies of meals consumed by women did not change in both communities. Women’s diets continued to be dominated by grain-based foods (mainly TZ and porridges) and accompanied by some leafy vegetable soups with anchovies. Groundnut was also common in their diets. Beverages were, again, mentioned as commonly consumed by some women but meat and fruits were not consumed frequently. The pattern of meals was as reported earlier: beverages and a variety of porridges in the early morning, followed by “nagban suli” during mid-morning, then afternoon and evening meals. Changes were, however, observed in the frequencies of their meals between the two seasons (that is, May-June and November) and proportion of women achieving minimum dietary diversity (MDD-W). The frequency of meals is presented in Table 4.10.

Table 4. 10: Frequency of meals at endline (May-June and November, 2017)

Freq. of meals	Yilkpene		End-line		Kpachilo		End-line	
	Baseline May/June (N=20)	Nov. (N=20)	May/June (N=20)	Nov. (N=20)	Baseline May/June (N=20)	Nov. (N=20)	May/June (N=20)	Nov. (N=20)
Less than three	0	0	0	0	2 (10%)	0	0	0
Three	3 (15%)	8 (40%)	3 (15%)	9 (45%)	6 (30%)	9 (45%)	8 (40%)	13 (65%)
Four or more	17 (85%)	12 (60%)	17 (85%)	11 (55%)	12 (60%)	11 (55%)	12 (60%)	7 (35%)
Mean	4.01	3.65	4.1	3.7	3.6	3.75	3.7	3.35

The observation in both communities was that more women consumed four or more meals in the periods of May-June, when there is shortage of food, than in November, when food is perceived to be in abundance for both baseline and endline phases. At endline at Yilkpene, there was no change in the proportion of women (85%) who consumed four or more meals in May-June. Kpachilo too did not experience any change in the proportion of women consuming four or more meals during the same period (60%). Not much difference was observed in the mean number of meals consumed at baseline and endline in both communities. The mean number of meals consumed at baseline at Yilkpene in May-June was 4.01 but it was 4.1 at endline for the same period. At Kpachilo, the mean number of meals at baseline was 3.6 and 3.7 at endline for the same period.

Presented in Table 4.11 is the comparative data on the Minimum Dietary Diversity of women at Yilkpene and Kpachilo at baseline and endlines.

Table 4. 11: Minimum Dietary Diversity of women at baseline and endline

MDD-W	Yilkpene				Kpachilo			
	Baseline		End-line		Baseline		End-line	
	May/June (N=20)	November (N=20)	May/June (N=20)	November (N=20)	May/June (N=20)	November (N=20)	May/June (N=20)	November (N=20)
Yes	11 (55%)	13 (65%)	15 (75%)	15 (75%)	11 (55%)	16 (80%)	18 (90%)	10 (50%)
No	9 (45%)	7 (35%)	5 (25%)	5 (25%)	9 (45%)	4 (20%)	2 (10%)	10 (50%)
Average	4.45	5.1	5.2	4.95	4.6	5.1	5.45	4.5
DDS								

Note: MDD- W –Minimum Dietary Diversity of Women (foods from five and more groups consumed).

Yes- Number or percentage of women scoring five or more food groups (or meeting the minimum dietary diversity score).

No -Number or percentage of women scoring less than 5 food groups (or not meeting the minimum dietary diversity score).

Average DDS – Mean Dietary Diversity Score of women surveyed

Data presented in Table 4.11 shows a general improvement in the achievement of the minimum dietary diversity of women. The data indicate that at endline, three-quarters (75%) of the women at Yilkpene achieved the MDD-W in May-June compared to the slightly more than one-half (55%) of women who achieved it at baseline. Similarly, nine-tenths (90%) of women at Kpachilo achieved the MDD-W at endline in the same period compared to its baseline proportion of slightly more than one-half (55%). On the contrary, while similar improvements in women's minimum dietary diversity at endline at Yilkpene were reported in November (75%) compared to baseline (65%) Kpachilo reported a decline from four-fifths (80%) at baseline to one-half (50%) at endline for the same period.

Consumption of micronutrient rich foods in Yilkpene: Apart from groundnut, iron- and vitamin A-rich foods were not frequently consumed in both communities as evidenced in the 24-hour dietary recall. The frequency of consumption of groundnut was generally high in November. Figures 4.3 demonstrate the frequency of consumption of groundnut by women in the two communities.

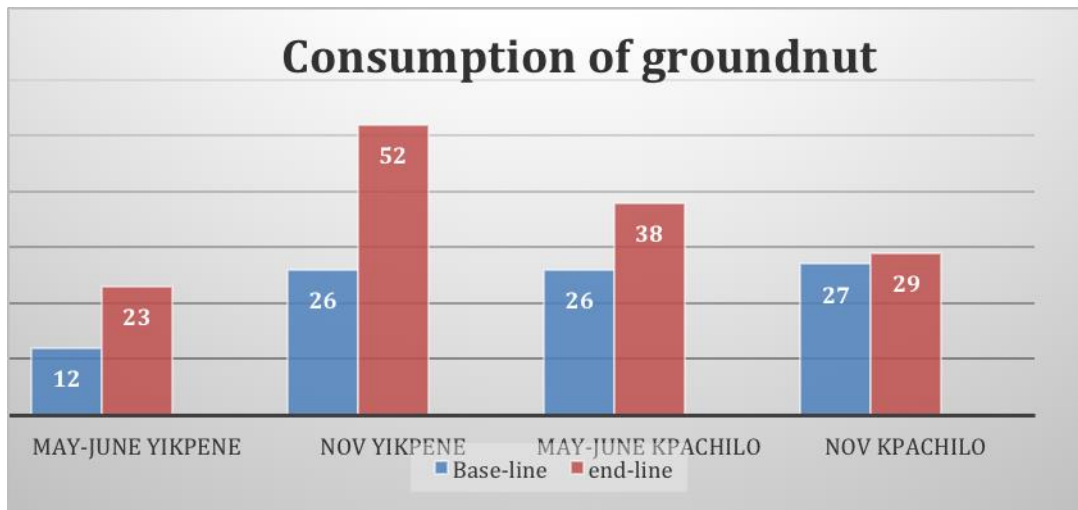


Figure 4.3: Consumption of groundnut

The consumption of legumes such as cow- and pigeon-peas and soya-bean was generally low at both baseline and endline in both communities. Even though consumption of soya-bean in particular was promoted during the intervention at Yilkpene, none of the 20 women interviewed in the 24-hour recall indicated consuming any. Figure 4.4 shows the consumption of cow- and pigeon-pea as well as soya-bean at base and endlines in the two communities.

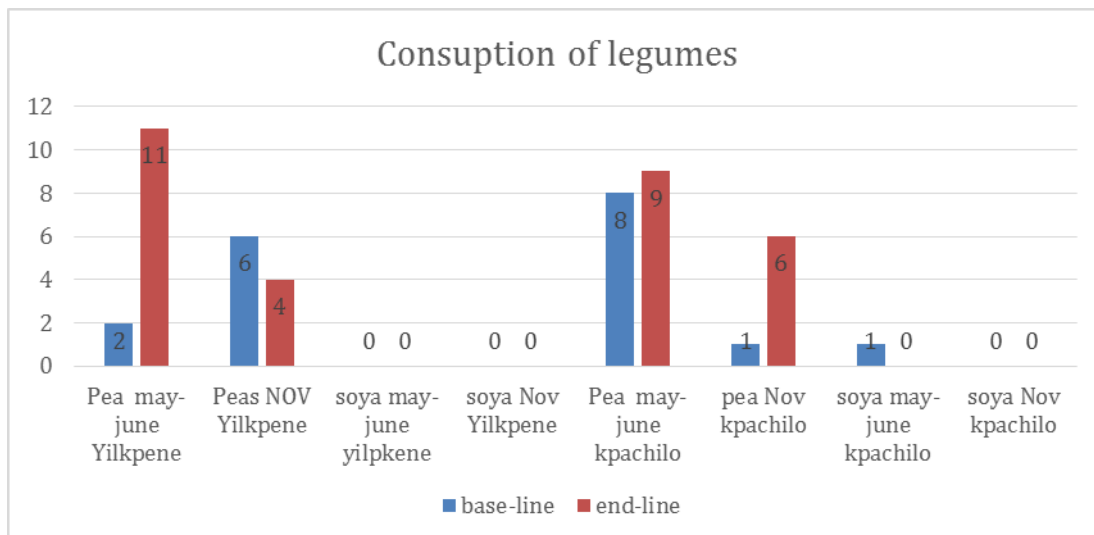


Figure 4.4: Consumption of legumes

Anchovies were the commonest animal-source food in the dishes of all households at both baseline and endlines in both communities. On the contrary, meat, other species of fish, egg and cow milk were less frequently consumed as shown in Figure 4.5.

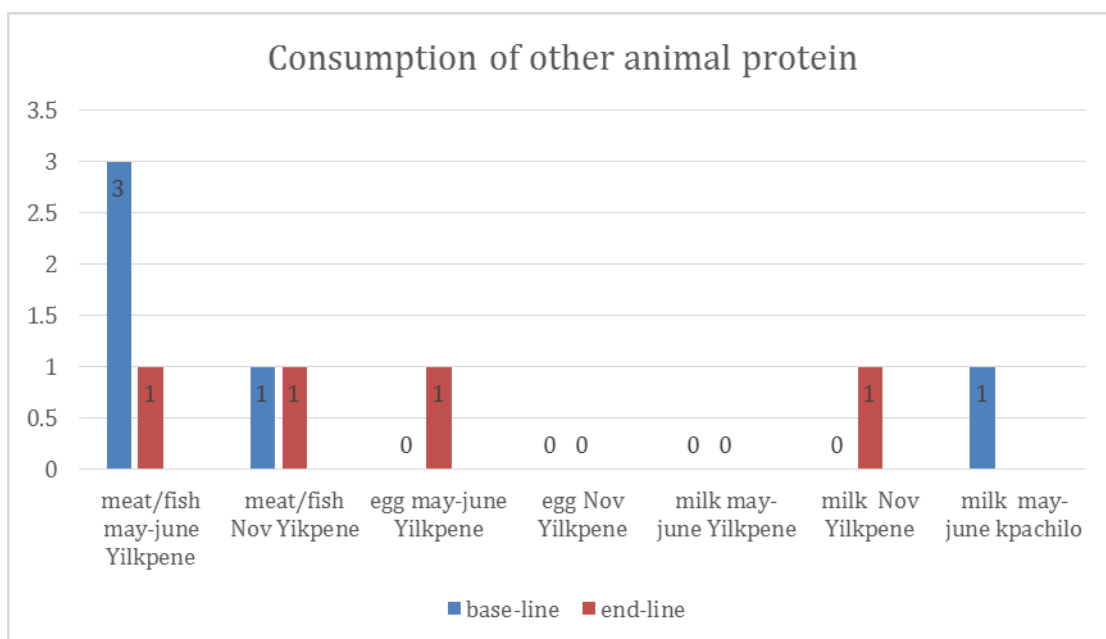


Figure 4.5: Consumption of animal-source proteins

The consumption of green-leafy vegetables was common even though it is affected by seasonality. Consumption tended to be generally high in May-June in both communities

but low in November. Dry green vegetables such as kuka (baobab leaves) and okro were consumed throughout the year. Figure 4.6 presents the frequencies of consumption of fresh green-leafy vegetables.

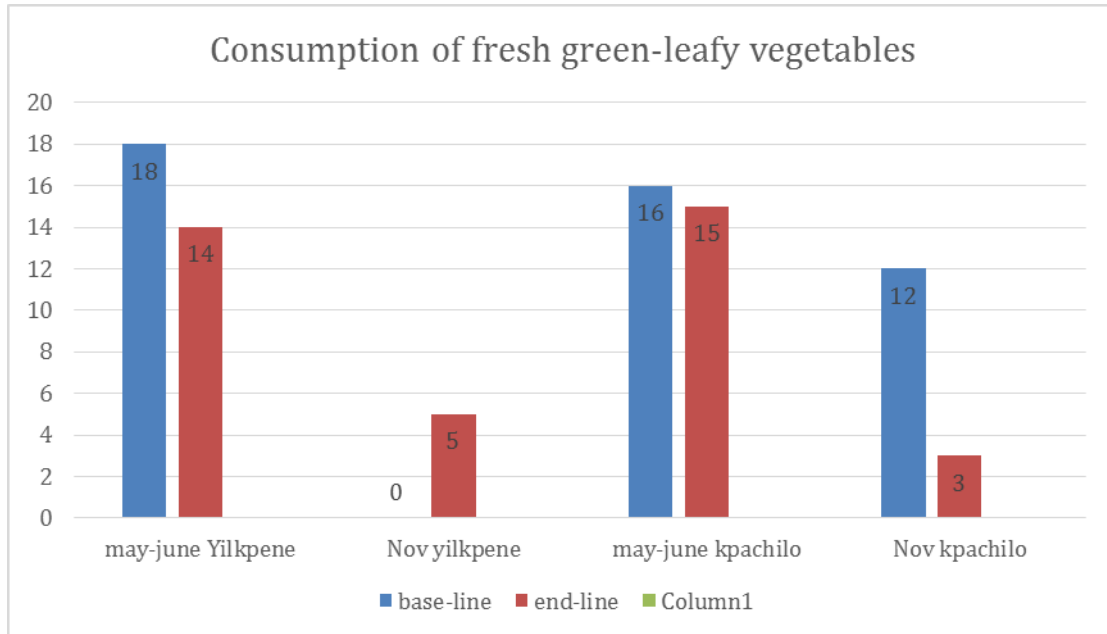


Figure 4.6: Consumption of fresh green-leafy vegetables

Similarly, the consumption of fruits – that is, wild fruits such as shea-fruits, dawadawa and ebony (“gaya”) and those externally sourced such as orange and banana - was reported to be low. At endline at Kpachilo, there were only two reported cases of consumption of banana and orange and 13 cases of consumption of shea-fruit compared with only three cases of consumption of ebony at baseline. Yilkpene, on the other hand, reported only three cases of consumption of shea-fruit at endline compared with two reported cases of consumption of mango and shea-fruit at baseline.

4.3.2 Participants’ perceptions of intervention

Focus group discussion participants and key informants at Yilkpene evaluated five issues related to the intervention. The issues were messages recalled, messages practised,

messages not practised, benefits of intervention and challenges related to the intervention activities.

4.3.2.1 Messages recalled and practised at intervention meetings

Table 4.12 shows a matrix of participant categories, messages recalled and messages practised.

Table 4. 12: Matrix of messages recalled and practised

Category of participants	Messages recalled	Messages practised
<i>Category 1(intense participation: 8 - 12 times at group meetings)</i>		
Men	-Importance of pregnant women's diets to their reproductive health outcomes -Importance of proper procession, preservation and preparation of food- storage of beans and grains	Sanitation: keeping compound and surroundings clean Incorporating soya-bean in household meals
Women	-Good environmental sanitation and hygienic cooking practices -Nutritive benefits of vegetables and fruits -Consuming a variety of foods in meals (groundnut added to koko, preparation of soya with yama -Dry-season home-gardening -Adolescent girls' diets: Allowing them to eat more food especially animal-source foods and legumes -Food preservation and preparation practices (fermenting maize flour for TZ) -Drying and storage of green vegetables in rainy season	Proper disposal of human waste by burying it in the ground Consuming cassava leaves Drying moringa leaves Cooking TZ with bra water
<i>Category 2(moderately-intense participation: 6-7 times at group meetings)</i>		
Men	-Nutritive values of soya, grain, beans, vegetables -Fermentation of grains -Adolescent girls' diets are important -Environmental sanitation -Sharing food according to need (meat for children)	Using soya to prepare foods
Women	-Consuming a variety of foods (preparation of soup with bra, eating groundnuts with koko, preparation of koko with soya, adding fish and dawadawa to vegetables) -Fermentation of grains -Environmental sanitation, personal hygiene -Nutritive values of fruits	Adding soya flour to groundnut paste to prepare bra soup Adding soya to koko Kitchen hygiene and domestic sanitation Washing cooking pots
<i>Category 3 (low-intensity participation: 1 -5 times at group meetings)</i>		
Men	-Nutritive values of beans, rice, leafy vegetables, fruits -Environmental sanitation -Preparation of foods with soya bean -Fermentation of grains	Domestic sanitation Consumption of egg and meat Soaking maize for grinding in next community
Women	-Benefits of soya, beans, leafy vegetables, -Combining a variety of foods in meals (soya bean in koko, "gale" and TZ) -Using water used to cook bra for TZ -Drying bra, moringa, cassava leaves, etc., in the shade not the sun	Soaking maize for grinding in next community Preparation of leafy vegetable soups/ kuka soup with palm oil Using water used to cook bra for TZ
Community key informants (leaders)	-Cultivation of a variety of foods -Adding groundnut to koko -Nutritive values of banana and other fruits, sweet potato, vegetables -Healthy diets for children -Environmental sanitation -WRA's dietary status important	Sanitation Helping wives to care for children Healthy diets for children Eating groundnut with other foods Cultivation of groundnut Cultivation of maize

Note: Category 1: participation in or exposure to 8 to 12 group meetings
Category 2: Participation in or exposure to 6 to 7

Category 3: Participation in or exposure to up to 5 group meetings

The data presented in Table 4.11 shows an aggregate of nine (9) messages were recalled by participants in Category 1 (participation or exposure to 8 – 12 group meetings) compared to 6 and 7 by Categories 2 (exposure to 6-7 group meetings) and 3 (exposure to up to 5 meetings) respectively. Women recalled more messages (15) than men (11). The messages recalled exclusively by men and women and those common to them are presented in Figure 4.7.

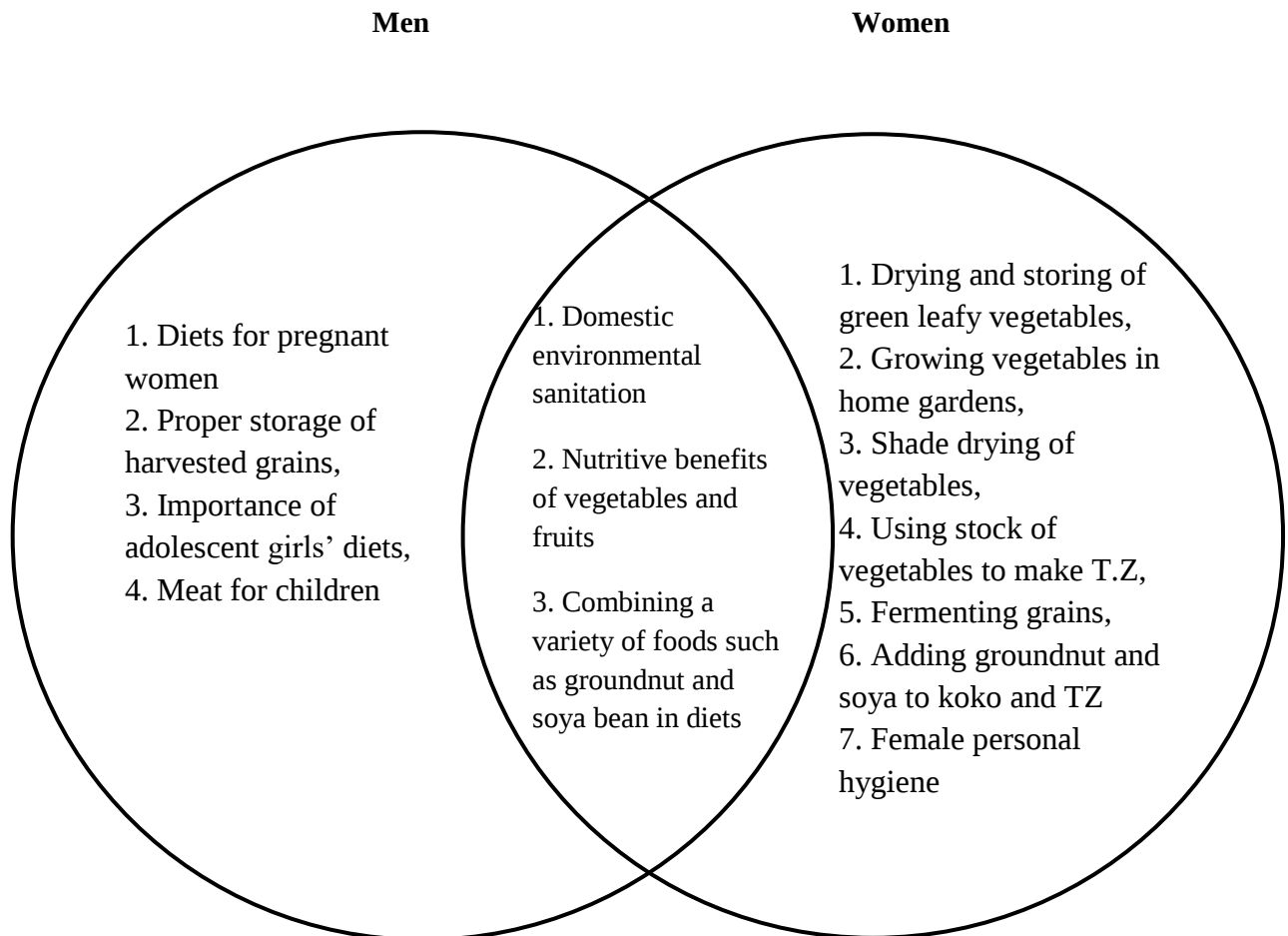


Figure 4.7: Messages recalled by men and women from intervention

Key Message 4 - “empowering women to have control over food resources”- was the only message that was not recalled by any of the participants. Additionally, key Message

3- “modification of unfounded beliefs about food” was recalled only in relation to the sharing of food in favour of children.

4.3.2.2 Messages practised by participants

Categories 1 and 3 participants reported the highest frequency of messages practised (n=5 each) but Category 2 reported the least. Key informants had practised six messages. Domestic and environmental sanitation (including disposal of human waste) was the key message practised by all three categories of participants as well as key informants. Some women indicated increased consumption of some foods like leafy vegetables, which they were not eating in the past. Additionally, they reported adopting drying of their leafy vegetables without using direct sunlight and using the stalk from boiled vegetables to enhance the quality of their TZ:

“Madam, have you seen cassava leaves? We used not to consume them because we didn’t know how healthy they were but through those Saturday meetings with Madam and her team, we’ve come to understand that they’re very healthy and now we consume them (...) Through those meetings, we also learnt that if we should dry our moringa and other leaves, we should do so in the shade and not in the sun so that they don’t lose their nutritive values (...) Before Madam and her team came to enlighten us, we used to throw away our bra stalk but we learnt from them that we don’t have to throw the stalk away since it also contains some nutrients and that we could stir our TZ with it again and that’s what we do now and when we do that, the TZ can even be kept up to 2 days without going bad” (Post-intervention FGD Y30 women; Category 1)).

More women than men reported practising messages heard- 8 compared with 4. The main messages practised by both men and women were domestic and environmental sanitation, fortifying dishes with soya flour and consuming TZ prepared with fermented maize flour. Only men reported practising the consumption of egg and meat. The messages practised exclusively by women included drying of leafy vegetables, cooking with vegetable stalk and observing good environmental sanitation during cooking:

“For me, when I want to prepare bra soup, I add soya flour to groundnut paste and even koko I add it to prepare it. I always add flour on the night before making the dough and, on the next day, when I prepare it, the koko tastes like yellow corn and my family like it a lot” (Post-intervention FGD Y28, women; Category 2).

Only key informants had been able to practise supporting their wives to care for their children and ensuring that the children consumed healthy diets. The only message practised by the community at large was environmental sanitation. The unanimous response of the three categories of participants was confirmed by all the key informants.

Both male and female participants in Category 3 identified consumption of fermented maize as the message they had not been able to practise owing to objection by the only local miller to the grinding of fermented maize:

“We tried to soak the maize before grinding but the miller will not accept it. Now we’re engaged in farming activities else we could send our soaked maize to the nearby communities for grinding” (Post-intervention intervention FGD Y33; Category 3).

In an exceptional case, a female participant added that she had been unable to practise the use of soya in her dishes owing to objection from her landlord to the alleged odour it creates:

“For me, I tried to use soybeans to prepare soup but my landlord doesn’t like it so I had to stop” (Post intervention FGD Y33; Category 3).

4.3.2.3 Benefits of intervention to participants

Female participants indicated that the benefits of the intervention to them were washing of drinking pots, disposal of children’s faeces, cleaning of vegetables before cooking, consumption of more vegetables, increased consumption of fish and consumption of TZ

prepared with fermented maize. Female participants in Category 1 labelled the benefits numerous:

“As for the benefits, they’re numerous. We can’t quantify them. Imagine you don’t know a person and the person skips several communities to come to your community just to talk to you about your own health and well-being. Now, we wash our drinking pots regularly because we know that it’s healthy for us” (Post-intervention FGD Y30 women; Category 1).

According to female participants in Category 2, the benefits included enhanced food safety as well as consumption of fish in contrast with reduced morbidity:

“We’ve benefited because now, when we bring the vegetables from the farm, we wash them but we wouldn’t do that first as we thought they were clean from the farm. I used to use GH¢ 3.00 worth of fish for the whole week but now I’ve increased it to GH¢ 5.00 because I want my family to be healthy. This year, there hasn’t been a lot of going to hospital and that’s because of Madam (that is to say, the intervention)” (Post intervention FGD Y28, women; Category 2).

Category I participants identified 7 specific benefits of the intervention to the community at large. Categories 2 and 3 participants identified 3 and 2 benefits respectively. The only unanimous benefit identified by the three categories and key informants was environmental sanitation. The female participants in Category 1 expressed the community’s unreserved appreciation of the communal benefits of the programme and specifically referred to the knowledge about the kuka tree obtained through the intervention messages:

“We know that the kuka tree is one of the few trees around that have no chemicals. The farmers have pumped all the other vegetables with chemicals which can be poisonous. We got to know from the intervention that the kuka leaves are very nutritious. Because of that, we’re so much enthused to prepare kuka soup because we know it’s very healthy for us” (Post-intervention FGD Y30, women; Category 1).

All the male participants in Category 1 confirmed that the intervention was immensely beneficial to the community. They particularly perceived messages relating to the health

of pregnant women and children, exposure to the nutritive benefits of locally-produced foods and improvements in dietary practices to be beneficial. They could not but express open appreciation of the intervention:

“We were very pleased and even now we are. If Madam would agree, we’d even build a room for her around the school so that she’d always be with us to give us more knowledge and counsel. We also wish that the Saturday meetings will continue” (Post-intervention FGD Y29, men (8-12).

4.3.2.4 Issues associated with intervention messages

Only men in Categories 1 and 3 in addition to key informants mentioned issues associated with some of the intervention messages they did not appreciate. The sole challenge stated by men in Category 1 related to misgivings about the call for women to have direct access to grain barns. Their misgivings were communicated through the following quotations:

“There was one thing that the intervention messages carried which I didn’t want. The message said that, since men are those doing farming and the women are those doing cooking, we should always give the grains or the major food items to them so that they’ll use them to cook (...). We don’t want it that way: a woman doesn’t know how to keep items (...) so if you give her the bags of maize, it wouldn’t even get to 3 months and she’ll finish up everything” (Post-intervention FGD Y29, men; Category 1).

On the contrary, the sole challenge revealed by the men in Category 3 pertained to misgivings about the calls to give women and children rather than men better portions of chicken. Their misgivings about the calls were stated as follows:

“The one thing I’ve difficulty with is the issue about we men giving what an old person should take to a child. Giving men’s shares to children is my biggest problem. For instance, giving the children the thighs and I eating the head or the legs (...). In our culture, if an old man should give what he’s supposed to take to children and rather take the children’s share, he won’t be respected” (Post-intervention FGD Y32, men Category 3).

The only challenge reported by key informants related to community members' expectations of monetary incentives for their participation in the intervention. The following quotation relates to the challenge:

“Well, for me, I’ll say that all that was done was perfect. What I would recommend is the issue of money but there’s a saying that if you teach someone how to fish, it’s better than feeding him with fish all the time. Some of the community members were expecting something. Maybe, they’re thinking that money would be given to them to invest in agriculture or any other form of development that wasn’t part of the intervention” (Post-intervention KII Y26).

4.4 Summaries of results

Presented in Tables 4.13a, 4.13b, 4.13c, 4.13d, 4.13e and 4.13f are the summaries of results at baseline and endline. The summaries are presented in line with the objectives of the study.

Table 4. 13a: Summary of results –objective 1- baseline and endline

Objective	Indicators	Baseline results for both communities	Endline	
			Yilkpene (intervention community)	Kpachilo (comparison community)
1. The food system and gender issues	Access to productive and household food resources	-Women had limited access to land, labour, credit and household food resources.	Community sensitized about need for women to be more empowered in terms of access and control over food resources.	No change
	Foods produced and use	-Men dominate in producing for home consumption and cash. -Women dominate in producing vegetables usually from the wilds for home use. -Men control income from household produce.	Sensitized about the need to begin cultivating vegetables for household to improve supply all year round	No change
	Food processing, preservation and storage	Inadequate preservation and storage facilities for women in particular	Sensitized on proper techniques of preservation and storage of food	
	Distribution and intra-household allocation of food	-Women dominate the sale of crops but price are determined by both. -Both men and women contribute to household food needs.	No change	
	Preferential food allocation system	Women are disadvantaged in food sharing.	Sensitized about need to share food according to need	No change

Table 4.13b: Summary of results- Objective 2 -baseline and endline

Objective	Indicators	Baseline results for both communities	Endline	
			Yilkpene (intervention community)	Kpachilo (comparison community)
2. Dietary knowledge and attitudes (perceptions and beliefs)	Knowledge of the 3 food groups	Most participants could not differentiate between the three food groups	Participants could differentiate between the three food groups	No change
	Knowledge of health-enhancing foods for women	Aware of good foods for women particularly pregnant women	Improved knowledge by adding a wider variety of foods	No change
	Sources of dietary knowledge	Health facilitates, the home, tradition and NGOs	Intervention was the additional source	No change
	Perceptions about healthy foods	-Meals containing dawadawa, fish, meat, beans -Foods that enhance health: sweating, drinking water, giving blood and energy -Hygienic food -Recommended by health worker	Addition: Food safety and not over-doing vegetables in particular	No change
	Food preferences	Soya bean, sweet potato, pigeon pea and cassava-based foods disliked by both men and adolescent girls Bouillon cubes disliked by men	Only foods disliked were soya-bean and bouillon cubes by most men	No change
	Perception of adequacy of women's diets	Divergent views on quality of women's diets: Some women felt their foods were adequate in terms of filling and keeping healthy Fewer women felt their foods were inadequate in terms of quality and variety	Participants perceived women's diets to be lacking in quality	No change
	Perception of the effects of poor diets on women's health	Problem of effects of women's diets not apparent Effects were associated with women's physical and psychological ability of women and not their reproductive health	Problem of effects of women's diets more apparent: Affects unborn child's health and causes anaemia in mother, difficult delivery	No change
	Adherence to food taboos and restrictions affecting all WRA	Strict adherence to food taboos affecting all WRAs	Restrictions on consumption of plant-based foods modified	No change
	Perceptions of the effects of food taboos on women's diets	Problem of food taboos affecting quality of women's diets not apparent	Effects of food taboos on quality of women's diets apparent	No change

Table 4.13c: Summary of results - objective 3- baseline and endline

Objective	Indicators	Baseline results for both communities	Endline	
			Yilkpene (intervention community)	Kpachilo (comparison community)
3. Women's dietary practices	Kinds of foods consumed	Mainly grains, some vegetables, groundnut and anchovies	No change	No change
	Frequency of meals	Majority consume 4 meals or more	No change	No change
	Preparation of food	-Most vegetables overdone -Little use of anchovies -Little use of vegetables -Do not add soya bean products to foods	-Vegetables not-overdone -Use of more anchovies in meals, Add soya bean flour to meals	No change
	Minimum dietary diversity of women	55% in either community achieved MDD-W	75%	90%

Table 4.13d: Summary of results –objective 4

Objective	Drivers
4. Drivers of women's dietary choices	Food security in households
	Food taboos and restrictions
	Women's physiological status
	Perceived healthiness of foods
	Large sizes of households
	Sources of information on food
	Tastes of foods

Table 4.13e: Summary of results –objective 5

Objective	Readiness level of Yilkpene at baseline	Not repeated at end-line
5. Community readiness to modify socio-cultural barriers to women's optimal diets in Yilkpene	Low readiness score (3)	

Table 4.13f: Summary of results – Community perceptions of intervention

Indicators for process evaluation in only intervention community (Yilkpene)			
Participants' perceptions of intervention	Coverage	Overall: 38% Men=33% Women=42% 55 out of 56 household participated	
	Exposure	Mean attendance =7	
	8-12 meetings	37.4%	
	6-7 meetings	30.5%	
	5-3 meetings	32.7%	
	Modifications to intervention	Extended period of intervention to address bottle-necks and misconceptions	
	Messages recalled	-Women recalled more (15) than men (11) than men - More massages recalled by participants with more exposure	-Both: good sanitation practices, nutritive benefits of vegetables and fruits and consuming a variety of foods -Men: food preservation and storage, importance of good diets for pregnant and adolescent girls Need to give children meat -Women: ensuring the availability of vegetables all year round through backyard gardening and proper storage techniques, improved food preparation methods and ensuring good hygiene among women
	Messages not recalled	Empowering women to have more control over food resources	
	Messages practised	Modifications of unfounded beliefs about food More messages practised by women (8) than men (4)	-Men: consuming egg and meat - Women: improved storage of vegetables, food preparation practices and observing good hygiene during cooking
	Message not practiced	-Consumption of fermented grains Not allowing women direct access to grains	
	Benefits of intervention	Category 1 identified more benefits of the intervention (7) than Category 2 (3) and 3 (2)	-Improved food hygiene, household and community sanitation practices -Improved consumption of vegetables, fish and fermented maize
	Perceived challenges associated with intervention	Men: -Uncomfortable about empowering women to have more access to household food resources Disagree with giving women and children better portions of meat Non-monetary rewards for community volunteers	

CHAPTER FIVE

5.0 DISCUSSION OF FINDINGS

The present study was a participatory action research aimed at identifying socio-cultural barriers to women's diets and designing and implementing a culturally-appropriate attitudinal and behavioural change communication intervention addressing the identified barriers. The study adopted the social cognitive theory by Albert Bandura (1999). The social cognitive theory describes the reciprocal relationship between three constructs: cognitive/personal, behavioural and environmental factors. These factors can act individually but may also interact with one another to produce change. The theory was found to be relevant to this study and the factors have been integrated into the discussion along the objectives of the study.

The pathway to attitudinal and behavioural change, which incorporated the social cognitive theory and community readiness assessment proposed for the study, was followed through as depicted in Figure 5.1

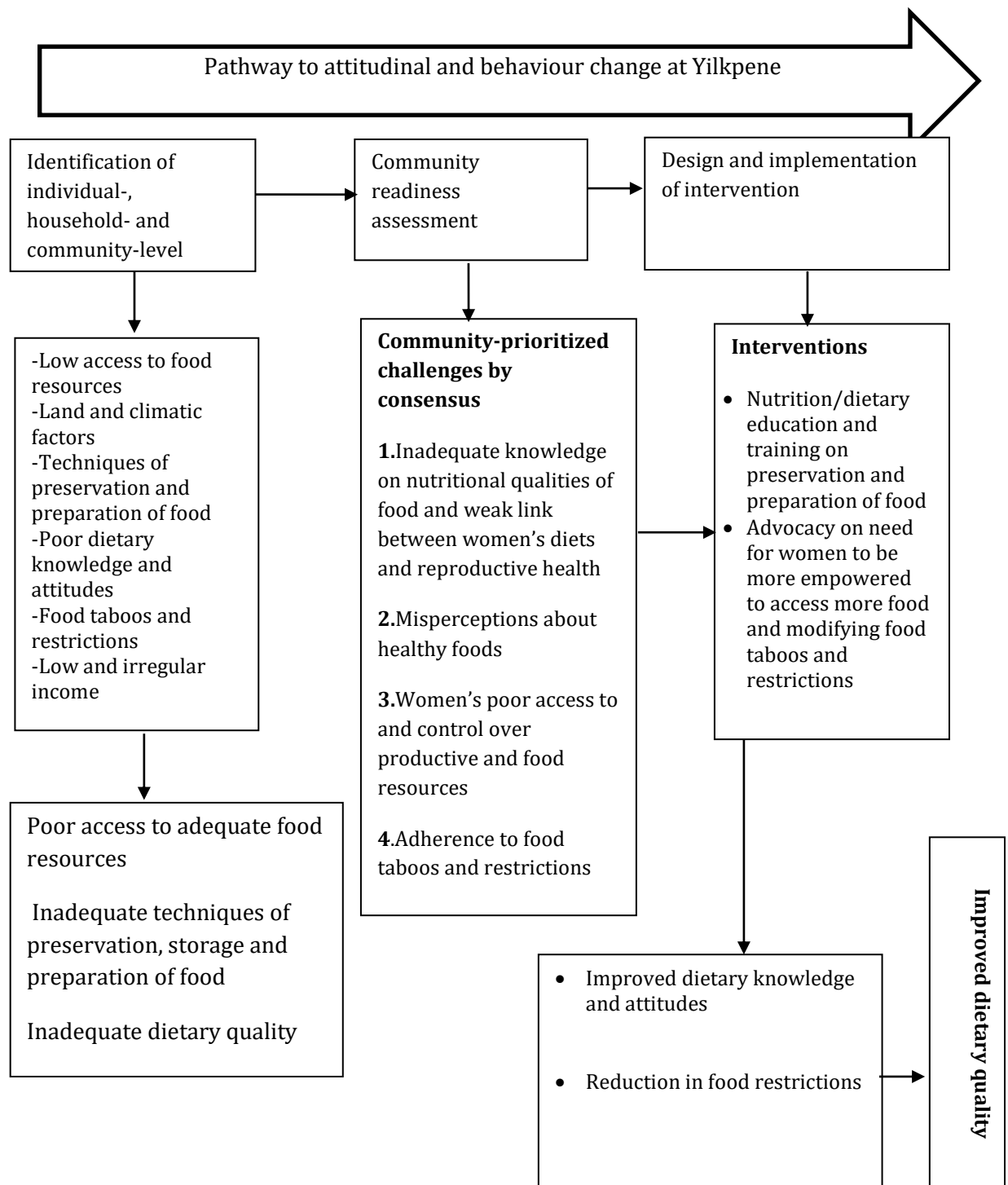


Figure 5.2: Pathway of attitudinal and behavioural change at Yilkpene

The pathway to attitudinal and behaviour change for the study was followed through as shown in figure 5.1. The pathway shows the identified baseline findings of individual-, household- and community-level challenges to women's diets during the exploratory

phase of the study. This phase was followed by a community assessment of Yilkpene's readiness for a socio-cultural intervention addressing the identified challenges. There was also a stakeholder consensus meeting to prioritize the identified problems. Six challenges were prioritized. This prioritization led to the design and implementation of an intervention (with two components) with active community participation. The results of the intervention were improved dietary knowledge and attitudes, modifications of plant-based food restrictions and improved proportion of women achieving minimum dietary diversity.

5.1 Traditional norms and gender affect the local food system

Gender-based barriers within the local food system were identified as posing challenges to women achieving optimal diets. The inability to acquire land, labour and other farming inputs; differences in the kinds of foods produced by men and women and their uses; and distribution and intra-household allocation, preparation and sharing of food were some of the gender-based issues identified as relevant barriers.

Women's limited access to land, labour and other farming inputs was identified as a challenge to producing a variety of crops needed to enhance their diets. Similar findings have been reported in sub-Saharan Africa and other parts of Ghana (Bambangi & Abubakari, 2013; Mohammed et al., 2013; Whitehead, 1999). FAO (2012) reported that land sizes in Ghana are generally small but women tend to have less access than men.

Women's inability to access land, labour and other farming inputs derives from the interplay of socio-cultural and physical environmental factors. Inheritance of land is restricted to male descendants mainly because married women belong to their husbands'

rather than their fathers' households (Bambang & Abubakari, 2013; Seebens, 2010). In essence, family land is distributed in a way that perpetuates control in men's hands.

Acquisition of land from other families is not a favourable option for women partly because they lack the money to hire land and partly because of lack of support from their husbands (Seebens, 2010). Natural and physical environmental factors such as climate change, environmental degradation, deforestation and bush burning may also contribute to women's unfavourable access to land. The combined effect of the natural and environmental factors is a reduction in the acreage of arable land, especially the sizes available to women (Kuhnlein & Peltó, 2009).

Even though women form an important part of the labour force for all farming activities - about 43% (FAO, 2012), they do not have rights to their husbands' and other male household members' labour (Seebens, 2010). Women traditionally need their husbands' approval to engage in financial and land transactions with external parties (such as members of other families and NGOs). This practice limits women's access to labour and farming inputs.

The results call for women's enhanced access to productive resources such as land through strategies such as co-operative farming and negotiations with land-owners and improved access to their husbands' and other household members' labour. There is also the need for the acquisition of farming inputs to be enhanced through more access to credit facilities for both men and women.

The two communities studied were primarily subsistence farming communities where food production is a household activity involving men and women. While men produce more quantities of both subsistence and cash crops, women mainly produced for home consumption. A number of nutritious foods were currently less produced while leafy vegetables and fruits were harvested from the wilds by women. Even though livestock production was carried out by both genders, men took decisions for their care and sale.

The findings agree with the report by FAO (2012) that Ghana is predominantly an agrarian economy and composed mainly of peasant farming. The report indicates that agriculture accounts for 82% of the total amount of land dedicated to farming activities and 80% of the country's food production. The findings also support an earlier WFP (2012) report on the small sizes of farmland in Northern Region, where 62% of households own between 2 and 5 acres of farmland. The results further reflect women's involvement in the various aspects of the food system (Mohammed et al., 2013 ; Seebens, 2010; Kuhnlein & Pelto, 2009).

Differences in the quantities and kinds of foods produced by men and women have been reported in other countries (Seebens, 2010; Doss & Morris, 2001). The differences may be partly attributed to access to farmland, labour and capital as discussed earlier. Men typically produce larger quantities and varieties of foods for both domestic and commercial purposes. Women, on the other hand, rely on their husbands' goodwill to access small portions of their land to grow mainly staple foods for home consumption (Bambang & Abubakari, 2013).

Labour plays a major part in women's inability to grow certain categories of crops such as root crops and legumes except in the case of soya-bean, which women are supported by some external agencies to cultivate. Participants explained that these categories of food crops are labour intensive and women do not have the requisite physical strength to cultivate them. Women's inability to access their male household members' labour coupled with their inability to hire labour limit their ability to cultivate large quantities and varieties of crops.

Climate change has contributed to the lower scale of cultivation of some nutrient-dense foods in the communities (WFP, 2012). Foods such as cotton and melon seeds, yam and millet are perceived as nutritious food items in the communities. The production of these crops, has, however, been adversely affected by the poor patterns of rainfall and the acute water shortage in the communities, limiting the varieties of nutritious foods available to women. Similarly, foods harvested in the wilds, consisting mainly of green-leafy vegetables and fruits, contribute to household and women's dietary quality. According to participants, in the past, these foods were collected in relatively large quantities by women for both home consumption and sale but, owing to climate change and human activities, they are currently in short supply.

Women's inability to produce large and varied quantities of crops has implications for their dietary quality since they are traditionally required to supplement their husbands' grain allocations with other foods needed to prepare meals for their households (Colecraft, 2012). The sale of most micronutrient-rich foods such as legumes and nuts cultivated by both men and women reduces household and women's dietary quality. The male participants explained that, since the market values of such crops are high, they sell

them to enable them to pay back loans used for their farming activities. Additionally, the attitude towards access to foods harvested from the wilds has negative implications for sustaining their availability. The result is a decline in the variety of foods rich in micronutrients available to women.

Sale at farm gates to market women is necessitated by the unfavourable socio-economic conditions such as the low levels of women's productivity, poor transport system and the challenge posed by the excessive demands made on women's time by their multiple roles such as child care, cooking and fetching of water (Seebens, 2010). Women may find it more expedient and feasible to sell their produce to market women at rates far below the market values; however, such transactions perpetuate poverty among the women, which, in turn, deprives them of access to quality diets.

Sale of foods at both farm gates and external markets requires the empowerment and mobilization of local women through producers' or farming co-operatives and other groups. These measures would offer women better bargaining power and greater levels of financial security against shocks such as unfavourable climate and transport difficulties. There is also the need to empower women to add value to their produce through improved techniques of production, processing and preservation to raise their levels of incomes.

Both men and women made provisions for household food needs. While men provided grains, women complemented the grains with soup ingredients and milling of the grains (Colecraft et al., 2012). The allocation of grains to women from the food barns has manifest and latent explanations. The manifest reason for the taboo against women

entering the food barns is the belief that a woman who goes into any barn to take grains gives birth to children who grow to be thieves.

On the contrary, the latent reason is linked with lack of trust, perceived mismanagement of resources and the need to keep track of stocks for future restocking. Men's control of food barns proved to be a contentious issue among the women. According to those who support a male-only access, the practice relieves women of part of the burden to worry about grains when they are running out. Those who oppose this view felt that giving women direct access offers them better opportunity to have adequate access to food for the household.

Women's relatively-low incomes hinder their performance of their roles such as milling the grains allocated by the men and getting ingredients for soups and sauces, which, are more expensive than accessing grains. This deficiency leads to poor quality of diets for households and women. This challenge calls for access to credit facilities for women to engage in alternative income-generating activities to enable them to access other food items to supplement their household food allocations from their husbands.

The current study found the practice of giving out grains as gifts a common practice which offered very poor women the opportunity to access food. Food gifts are made in obedience to one of the five pillars of Islam called Zakat (Hossain, 2012). Zakat is a form of worship in which relatively wealthier Moslems are obliged to share their wealth (or harvests in the context of this study) including food with the poor or needy in society. Hossain (2012) claimed that the concept of Zakat, as practised among Moslems, could serve as a tool for alleviating poverty and hunger in poor communities since the poor

have the right to the wealth of the rich and the latter have an obligation towards the former. Donor goodwill in the study communities, however, depends on the levels of production, magnitude of overall demand by potential beneficiaries and their own domestic circumstances.

Gender and age influence the division of roles for the preparation and sharing of food for the household. Even though preparation of food is primarily done by women, it is subjected to division of labour on the basis of age and order of marriage among the women in the household. Women generally serve the food they prepare but the serving of meat is done by men. The influence of gender, age and order of marriage in preparation and sharing of food and eating arrangements corroborates findings by Gittelsohn and Vastine (2003); Leroy et al. (2008), and Dickson et al. (2016). The findings also confirm the report by Kavle and Landry (2013) that in many lower- and middle-income countries, men and children eat before women are served. The finding implies that women's access to lower quantities and less-nutritious components of foods, may affect their dietary intake and quality.

Tradition around the performance of specific domestic chores such as the preparation of food as the responsibility of women has been reported (Seebens, 2010). Cooking for large households exerts a heavy toll on women financially, physically and psychologically -with potential adverse effects on their diets and health. The decision to prepare a particular type of food in a household is dependent on the preferences of men, who allocate food items to the women usually on a weekly basis. Older women, usually husbands' mothers, are the other members of the household who make decisions regarding food consumption.

Restriction of the preparation of food to raw materials allocated by men has some socio-cultural connotations. It could reflect the imbalance in power and authority, which is traditionally skewed in favour of men in the patriarchal cultural system. Involvement of mothers and mothers-in-law in making household food decisions further depicts the influences of patriarchal elements. The elderly women's power and authority are derived from their kinship ties with the male heads of households and so they act in place of their sons not daughters.

Issues of power, authority, gender, age and the related traditional perceptions of value placed on contributions to the acquisition of food are at play in the food-sharing system and eating arrangements. It is, thus, allegiance to and respect for tradition that accounts for the preferential treatment of men and the aged at the expense of women and children respectively. The woman who prepared the food is the first to have her bowl served prior to the rest of the household being served (with the better portion). The manifest explanation was that she should have the top-most portion, which is usually not so good. The latent reason for that practice, however, seems to be linked to the traditional mutual mistrust and scepticism among co-wives in a polygamous household. The woman who prepared the food is, thus, required to have the first taste of it ostensibly to assure the other women of its safety. Additionally, eating after everybody else is satisfied deprives the women of the benefit of eating to their satisfaction.

Men traditionally serve the meat because, first, it is perceived as a sign of respect for the men who provided it. The second reason is to ensure fairness to other members of the household since there are typically several wives and any woman sharing the meat might be tempted to favour her children. Third, women are believed to be ignorant of the

specific parts of the animals that should go to the various members of their households. Women are given the bony parts of an animal such as the back of a chicken or a ruminant ostensibly to enhance the development of strong bones to facilitate their carrying of pregnancy and going through child-birth.

The coping strategies adopted by communities and women to mitigate the effects of food shortage have been reported in other parts of northern Ghana (Saaka, 2016; Armar-Klemesu et al., 2015). The two studies reported reductions in the sizes of women's portions of food and resorting to preferential food allocation, in which women go without food to ensure that other members of the household, especially children, get enough food to eat. Purchase of food through the sale of livestock and other items is a common practice among most households in Ghana (Armar-Klemesu et al., 2015). The coping strategies adopted by women attest to their contribution to all aspects of food security in Ghana: availability, accessibility and utilization of food (Mohammed et al., 2013).

Sale of households' livestock, other foods and assets is traditionally done by men as is the disposal of income earned from any sale. Women have no access to such incomes. Younger women often migrate to southern Ghana during periods of low-farming activities to earn income as casual labourers (Abu, Louw, Raubenheimer, & Berg, 2014) and the incomes earned are usually controlled by women and used to buy household needs including food to supplement what the men allocate to them. This finding supports the claim by Duflo and Udry (2004) that women spend their incomes on household food needs and, particularly, on their children's. The findings, does not, however, fully support the claim by Duflo and Udry (2004) that men spend their money on personal

needs (Duflo & Udry, 2004). The findings reveal that men spend their incomes on grains, children's education, festivals and acquiring additional wives.

Some of the coping strategies adopted by households, and women in particular, to mitigate the effects of food shortage are likely to contribute to women's poor dietary status. Reductions in grain allocations and sizes of women's portions of food, for instance, are likely to reduce women's food intake.

5.2 Community members' dietary knowledge and attitudes have implications for quality of women's diets

A fundamental finding in this study is that community members' dietary knowledge and attitudes are important determinants of the quality of women's diets. Diet is an integral part of culture and knowledge on it generally forms part of the socialization process. Diet is also an integral part of oral tradition that is passed on from one generation to the next. Health workers also provide dietary information to women during ante-natal and post-natal clinics.

The finding on sources of women's dietary information identified by participants corroborate the report by de-Graft Aikins (2014) that women's nutrition and dietary knowledge comes from multiple sources including "lifeworlds" and the health system. The role of family members, particularly mothers, mothers-in-law and friends, as trusted sources of dietary and health information, which is passed on from one generation to the next, has been reported in other low- and middle-income countries (Kavle & Landry, 2018). The sources of information attested to the influence of informal and non-formal forms of community education, especially in rural communities. Access to information

through the school and television to the group of adolescent girls pointed to the potential effectiveness of a segmented-target population approach to the implementation of a nutrition and dietary intervention.

Participants were of the opinion that the foods they consumed enhanced their health. The finding on women's dietary knowledge corroborates findings from a report by de-Graft Aikins (2014) that indicated that women's lay knowledge of nutrition was not too different from that of experts or medical nutrition knowledge on the basis of the foods being generally healthy. In this study, however, participants at baseline could not differentiate between high-nutrient-density foods and low-nutrient-density foods. The apparent factors included the influence of tradition, lack of exposure to a sustained intervention and their low levels of formal training and education on diets (Amugsi et al., 2016; Dunneram & Jeewon, 2015; FAO, 2012a; WFP, 2005). Participants' lack of adequate knowledge on the nutritive qualities of different varieties of foods may prevent them from ensuring adequate balance in the varieties of foods contained in their diets, thus, limiting their dietary quality.

Participants also had some misconceptions about what healthy foods were at baseline. For instance, they labelled groundnut an unhealthy food, particularly for pregnant women, for two main reasons. First, it was perceived as a "cold food" - that is, food that made the foetus lazy. Second, groundnut was associated with diarrhoea. Pregnant women were, therefore, prohibited from eating groundnut-based foods though it is essentially one of the main sources of protein and fat in the communities. Groundnut contains 47% fat and 38% protein (Atasie, Akinhanmi, & Ojiodu, 2009). Groundnut has also been reported to be forbidden for women during pregnancy among the Akwapims of Eastern

Region of Ghana (de-Graft Aikins, 2014). In Nigeria, groundnut was reported to be associated with giving birth to very big babies and, hence, its prohibition among pregnant women (Girard et al., 2012).

The similarities between the lists of foods liked and disliked at Kpachilo and Yilkpene identified in the study could be attributed to their common socio-cultural factors such as ethnicity and religion. Other socio-cultural factors including access to and affordability of externally-produced foods, migration, the media and interaction with non-indigenes may also contribute to their food preferences. The non-socio-cultural factors for the findings include the physical (natural environment), especially climate, vegetation, relief and drainage, that influence the elements of the food system such as the main varieties of locally-produced staples.

The finding that women and adolescent girls had preference for sugar-sweetened beverages presumably relates to the popular perception that they have inclination towards sweet and processed products. On the contrary, the findings that men had preference for the energy-giving starchy staples and dislike for bouillon cubes, which they perceived to cause sexual impotence, might be traced to men's perceived attraction to symbols of power, strength and sexual potency.

Some participants perceived women's dietary quality to be inadequate in the communities. They linked women's poor diets to the food insecurity situation and not to socio-cultural factors such as denying women access to reproductive resources and restricting their consumption of some categories of foods. The high cost of quality foods such as green-leafy vegetables and fish and the limited varieties of foods consumed were

the two main reasons for women's poor dietary quality. The limited quantities of nutrient-dense foods in women's diets explain why women's diets are of low quality. The perception among participants that women's diets are inadequate reflects the sub-optimal intake of food in low-income countries reported by Dickson et al. (2016) and Martin-Prevel et al. (2017). The perception also supports the earlier claim by Ramakrishnan (2002) that micronutrient malnutrition is very common among WRAs in low-income countries. Participants' awareness of nutrient gaps in women's diets can serve as an opportunity for an intervention to address them provided the necessary resources for it are available.

The findings that other participants, particularly women, perceived women's diets to be adequate in the study communities might reflect a false feeling that women's diets were sufficient in terms of quality and quantity. Entrenchment in the local dietary culture coupled, perhaps, with their relatively low acquaintance with different socio-cultural environments might have misled the women to consider the qualities of their diets as adequate. Availability of fish and vegetables, which was one of the reasons for their assessment of women's diets as adequate, was a necessary but not a sufficient condition for dietary adequacy. The health benefits of the available foods needed to be supplemented by those of the less-frequently consumed foods such as meat, legumes and fruits to ensure that foods belonging to the energy-giving, body-building and protective categories were consumed in appropriate proportions. Satisfaction derived from the consumption of the foods was only quantitative rather than qualitative. The perception that the foods did not make their consumers sick reflected their prior identification of absence of disease and preventive potency among the attributes of good health. This perception also related to the perception of the presence of good physical

energy to perform chores as an attribute of health. In other words, as long as the consumption of the foods did not interfere with the women's performance of their multiple roles, they perceived them to be adequate. There is the need for promoting the culture of eating not just for satisfaction but also for health (including micronutrient intake).

The effects of food shortages on the community and women identified in this study have been reported (Saaka 2013). The non-awareness at baseline of the link between women's diets and their reproductive health outcomes has also been reported by studies in Nigeria and Ethiopia by Girard et al. (2012) and Saldanha et al. (2012). Girard et al. (2012) and Saldanha et al. (2012) indicated that both community members and health promoters related poor pregnancy outcomes to the "divine will" or to God, who determines the unborn child's health. Other studies revealed that community members believed that the foetus and food were both contained in the stomach so eating too much food would not create enough space for the foetus (Huybregts, Roberfroid, Kolsteren, & Camp, 2009; Christian et al., 2006).

Participants' inability to relate women's diets to their reproductive health may have accounted for community members' failure to give challenges to women's dietary quality due consideration. There is the need for continuous community-based nutrition education activities targeting all community members to understand the importance of women's diets and their reproductive health. Men, who dominate in the production of a wider variety of foods, must be encouraged to reserve more of the nutrient-dense foods for home consumption.

Participants in both communities had positive attitudes towards food taboos and restrictions at baseline. Food taboos and restrictions pertaining to WRA were based manifestly on superstition and misconceptions about their effects on the women's and their unborn babies' health (health motives). Society's eagerness to safeguard its collective dignity, spiritual purity and survival is the latent force behind the restrictions (Senah, 2003). The perception of some foods as inappropriate for consumption by WRA owing to cultural taboos and misconceptions has been reported in other low- and middle-income countries such as Burkina Faso, India, Indonesia, Nepal, Nigeria and Senegal (Kavle & Landry, 2018).

The identification of food taboos and restrictions for WRA agrees with the two sets of food beliefs labelled by Gittelsohn and Vastine (2003) as either permanent or temporary (transitory). Identification of the flesh of the dog as a general food taboo on grounds of its status as a totem for the Dagomba tribe and in the Islamic faith relates to the claim by Senah (2003) that, in almost all cultures, totems exist to create a unique identity for people who belong to or are from the same clan or religion. The prevalence of food taboos and restrictions for WRA relative to general food taboos confirms the report by Gittelsohn and Vastine (2003) that food taboos and restrictions mostly affect women and to some extent, the sick and children. In the current study, very few taboos such as those that bordered on cultural identity (e.g. flesh of the dog) and religion (e.g. flesh of the pig and, again, the flesh of the dog) affected men.

Several of the temporary food taboos and restrictions identified in the study were similar to those found in other cultures. Examples are perceptions about eating oily foods during pregnancy, "cold" and heavy foods during lactation in Pakistan, meat and fish in Sudan,

buffalo milk in India and fish in Vietnam (Niloufer et al., 2003). Other similar restricted foods were leafy and green vegetables and snail in Nigeria (Ogunjuyigbe & Ojofetimi, 2006) and “mrigal maach” (a type of fish) in Bangladesh (Levey et al., 2013). Finally, the reasons for the taboos and restrictions identified in the study- that is, the desire to protect the WRA’s health and their unborn babies as well as the family’s image and dignity - were similar to those reported in other parts of Ghana (Arzoaquoi, 2014a; Senah, 2003).

Communities’ positive attitudes towards these taboos and restrictions have implications for the quality of women’s diets. Unfortunately, most participants in both communities at baseline could not link the negative effects of food taboos and restrictions to the quality of women’s diets. Community members’ perception that food taboos and restrictions had no negative effects on women’s diets agrees with the report by Levey et al. (2013) that the influence of food taboos on women’s dietary practices was low in Bangladesh.

Armar (1989), Niloufer et al., (2003); Perez and Gracia (2013) and Kavle and Landry (2018), however, indicated that positive attitudes to food taboos and restrictions led to the elimination of nutrient-dense foods from women’s diets and, hence, exposed them to malnutrition. Kavle and Landry (2018) reported that in Indonesia, for instance, about 14 kinds of vegetables, 10 kinds of fish, 10 kinds of animal-source foods and as many as 14 different types of fruits are avoided by pregnant and lactating women. Non-consumption of pigeon-pea, wild (bush) meat, chewable foods, fruits such as dawadawa and, especially, green-leafy vegetables could deprive lactating women of their body-building and protective nutrients. Potential implications of practising these taboos are the low

quality of women's diets and their subsequent effects on their well-being and reproductive health (Martínez Pérez & Pascual García, 2013).

5.3 Women's dietary practices are likely to improve if the drivers of their dietary choices are addressed

Another essential finding of the study, which explained women's poor dietary status in the communities, was that starchy foods dominated their diets. Majority of the foods that were reported by women in their 24-hour dietary recall were starch-based with little variety from the other food groups. The inadequate inclusion of foods from other groups in the diets leads to poor dietary quality as has been reported in the Ghana Nutrition profile (FAO, 2009) and GDHS (2015). The range of foods consumed by women also agrees with the findings of two recent studies conducted in Northern Region of Ghana which indicated that women's and young children's diets there were dominated by grain-based foods (Armar-Klemesu et al., 2018; Armar-Klemesu et al., 2014). The findings also confirm the report by Zereyesus et al. (2014) that more than 40% of women in the three northern regions of Ghana ate diets that were characterized by low-diversity scores- that is, foods belonging to less than five food groups- an indication of the low quality of their foods including their nutrient densities. The current study found 45% of women not meeting their minimum dietary diversity requirement of five or more food group at baseline. Other studies by Kobati et al. (2012) and Koryo-Debrah (2012) reported that women in the savannah zone could not meet most of their nutrient requirements.

Low diversity of women's diets is not peculiar to northern Ghana. The low consumption of meat, egg, milk, vegetables and fruits reported by Nti (2002), Kobati et al. (2012) and Amoateng et al. (2017) has been confirmed by the current study. Studies in other parts of

Africa, Asia, Latin America and the Caribbeans have reported similar findings (Workicho et al., 2016; Lee, Talegawkar, Merialdi, & Caulfield, 2013).

Even though majority of women (55%) consumed foods belonging to 5 or more groups, the consumption of anchovies, green-leafy vegetables and legumes (particularly groundnut) was observed to be low in their diets resulting in sub-optimal quality. The small quantities of anchovies (inexpensive small fish) observed in women's meals could be attributed to their inability to afford adequate quantities owing to their low levels of incomes. The small quantities of legumes and nuts could be explained by their cultivation for cash purposes. Men's dislike for soya-based foods could have accounted for their low consumption by women.

The findings on the frequency of meals consumed in this study contradict report in the Ghana Nutrition profile (FAO, 2009) that women consume three meals a day instead of four reported in the current study. Another contradictory finding is the less consumption of ready-to eat meals in the current study compared to findings from other studies (Andaleeb & Caskey, 2007). Andaleeb and Caskey explained that ready-to-eat meals had become very common as a result of more people working out of home, particularly in urban communities. In the current study, however, owing to the absence of paid employment outside the home and low income levels of households, buying ready-to-eat meals was uncommon.

The drivers/determinants of women's dietary choices identified in the current study included issues related to food security, perceived healthiness of foods, tastes of foods, women's physiological statuses, food restrictions and taboos, large sizes of households

and sources of information on foods/diets. The drivers identified in this study have been reported in earlier studies carried out among women in urban Africa and other low and middle-income countries (Kavle & Landry, 2018; Gissing, Pradeilles, Osei-Kwasi, Cohen, & Holdsworth, 2017; Monterrosa, 2017). The influence of household food insecurity further reflects the barrier posed by economic constraints to access to more nutritious foods such as dairy products, fish, chicken, eggs and meat among women in general in low-income countries such as Ethiopia, Tanzania and Kenya (Young and Pike, 2012). Similarly, the influence exerted by sources of information on diets agrees with the earlier findings that most pregnant women consumed foods recommended by members of their families (especially mothers and mothers-in-law) and friends owing to their respect for these trusted traditional sources of information about diets (Choudhury & Ahmed, 2011).

Strategies to enhance WRA's diets should take due cognizance of the seven factors identified in the current study that influence women's choices of food. Neglect of any one or some of the factors would not augur well for WRA's dietary status because of the strong inter-relationships among them.

5.4 Community readiness and intervention coverage

A cardinal finding was that even though low levels of readiness and intervention coverage were reported at Yilkpene, the intervention led to some improvements in participants' dietary knowledge, attitudes and practices. Practices relating to gender imbalances in the food system, however, did not change. The intervention also led to the sensitization of members of the intervention community on the need to address socio-

cultural barriers to women's diets such as women's access to and control of household food resources, preferential food allocation practices and taboos affecting women's diets.

Low readiness scores have been reported in other public health-related interventions such as weight/obesity and HIV/AIDS (Pradeillis et al., 2016; Findholt, 2007; Kennedy et al., 2004). The level of readiness was low in this study presumably because members of the community who had the general feeling that the issue of WRA's diets needed to be addressed felt they were not empowered enough in terms of financial resources to embark on such an intervention. Another presumption may have emanated from the general feeling of helplessness and inertia that dominates traditional rural communities, where external efforts targeted at local problems tend to be more welcomed than the internal.

The low coverage of the intervention (in respect of the number of participants attending group meetings) might be explained by the pro-female nature of the intervention, which sought to address women's dietary challenges. At baseline, most participants perceived women's dietary quality as the norm and not peculiar to only women. Hence, there was no need to address it. The second reason might be the socio-cultural nature of the intervention, which sought to encourage community members, particularly men, to empower women in terms of accessing more food resources.

The nutrition and dietary education led to improved dietary knowledge and perceptions and improved methods of food preparation among participants at Yilkpene. The improvements in dietary knowledge reported in this study agree with reports of earlier evaluation studies that community-based nutrition education improves participants'

knowledge on nutrition (Otoo & Adam, 2016; Abu, Louw, Raubenheimer, & Berg, 2014; Tchum et al., 2009). Improvements in the proportion of women achieving the minimum dietary diversity after an intervention have been reported in Mali (Bonde, 2016). Contrary to the findings by Otoo and Adam (2016), this study did not find improvements in the post-intervention intake of micronutrient-dense foods. Anchovies, were universally consumed at all major meals in the households owing to their relatively high scopes of availability and affordability but quantities consumed remained relatively small. Groundnut was also commonly consumed because women kept parts of their own produce and what they earned as payments for labour services for consumption by their households but quantities consumed were very small.

The lower scopes of consumption of legumes such as cow- and pigeon-peas and soya-bean, meat, egg, milk and fruits could be attributable to economic and attitudinal factors. The peas, soya bean and livestock were produced mainly for commercial purposes and, hence, their low domestic consumption. In the case of soya bean, in particular, the additional reason for its low scope of consumption was the low level of preference for it by the menfolk in the communities who associated it with stomachache, diarrhoea and stroke.

The reasons for the lower levels of consumption of fruit and vegetables could be both economic constraints and seasonal variations in levels of availability (Abizari, Azupogo, Nagasu, Creemers, & Brouwer, 2017). Economically, women's levels of income are too low to afford them fruits and vegetables when their seasons are over. Additionally, since women are not supported financially by men to acquire other household food items, they are unable to afford them as and when needed.

Advocacy on effects of food taboos and restrictions on women's diets yielded some behaviour modification. Pregnant and lactating women reported consuming most of the plant-based foods such as slimy foods, which were hitherto considered restricted foods for lactating women; however, attitudes towards all the animal-source foods taboos did not change in both communities. The probable explanations could be the entrenched socio-cultural nature of such practices bordering on superstition and respect for tradition as indicated by Senah (2003). According to Senah, taboos exist to create a cultural identity among groups of people or a clan and that a violation of such beliefs attracts punishment from either the group or gods. Failure to abide by such practices may also contribute to one losing one's cultural identity. Hence, there is the need to find other strategies to address these entrenched beliefs and practices.

The two components of the intervention - that is, nutrition/dietary education and advocacy on women's access to and control of food resources - were both implemented as planned. Participants were sensitized on the need to empower women with more food resources and not necessarily to bring about a change in behaviour since socio-cultural issues are entrenched and may need prolonged periods of sensitization to bring about change. Raising consciousness is suggested as the first step in a behaviour change process (Prochaska, Colleen, & Evers, 2008). Raising people's consciousness on a particular behaviour can be achieved through advocacy and sensitization.

The intervention succeeded in raising Yilkpene's level of consciousness on some socio-cultural practices affecting women's diets even though the feedback from male members was not favourable. For instance, the male participants demonstrated their displeasure at sensitizing the community on the need to allow women more access to household food

resources. They indicated that women could not be trusted to manage food resources effectively. The misgivings about the call for women to have direct access to grain barns as well as those about the calls to give women and children, rather than men, better portions of food derive from objections to any suggestion suspected to be aimed at tampering with sensitive socio-cultural systems such as power and authority, social control and stratification. Women and children's diets could be the victims of such acts of cultural reaction.

Post-intervention results showed improved dietary knowledge and the proportion of women achieving minimum dietary diversity in both the intervention and comparison communities. Ngowi et al. (2008) reported similar findings in a randomised control trial in a community-based intervention to estimate the effectiveness of health and pig-management education intervention to reduce the incidence rate of a pig disease in Tanzania. The study attributed the improved knowledge of pig-management in both intervention and control groups to their inability to control the experimental conditions, which resulted in information contamination either from the intervention group or another external source and the Hawthorne effect (Ngowi et al., 2008). The Hawthorne effect is a situation where an individual changes his or her behaviour because he or she is aware of being observed. Thus, giving a false effect of the intervention being introduced.

In the current study, however, the experimental condition was controlled to a large extent by monitoring both the intervention and comparison communities to account for other community activities outside of the intervention that might help explain the post-intervention outcomes. Data from the monitoring activities indicated that a possible explanation for the improvement in the proportion of women achieving the minimum

dietary diversity at Kpachilo was the nutrition-related activities of NGOs in the community as well as the involvement of the District Nutrition Officers in the intervention activities. The inability of the intervention to effectively control for intervention contamination is a major weakness associated with quasi-experimental designs (Fisher & Foreit, 2002).

The success of the intervention may have derived partially from its participatory nature in which the principles of adult education were applied throughout the intervention process. The active participation of community stakeholders in the selection of identified challenges to women's diets, their proposed solutions to addressing the challenges and contributions to the design of a communication strategy for the intervention encouraged ownership of the intervention among members of the community. In addition, the community selected some of its own members to form part of the implementation team.

The adult learning principles which the intervention drew on included the principles of involving adults in the planning and evaluation of their learning exercises as indicated above; using participants' experiences as the basis for the learning activities and topics or subjects learnt having immediate relevance to participants' personal lives (Knowles, 1984). Participants' rich stores of experiences on diets and their readiness to learn about their dietary situation were utilized during the group meeting sessions, when participants were encouraged to share their personal experiences with their groups before discussing topics scheduled for the day.

Facilitating the group meetings and other sessions in this manner assured participants of their self-respect, thus, allowing them to fully participate in the intervention activities.

The nutrition and dietary education as well as the training on proper methods of preservation, storage and preparation of food helped to increase participants' self-efficacy to be able to practise some of the messages such as improving their cooking and practices of environmental hygiene.

Other factors that might have accounted for the successful implementation of the intervention include the use of the local dialect of the community as the medium of facilitation and communication; rapport and mutual trust between the research team and participants and relevance of messages to women's and household dietary needs. Other factors include the convenient timing of the activities, use of homogenous groups of participants, convenient seating arrangements and the interactive approach to facilitation. The suggestions made by participants for the intervention to be sustained through continuation of meetings and their readiness to provide accommodation facility for the research team to live with them in the community attest to their appreciation of its benefits to the community.

Implications: The findings give credence to the fact that when participatory interventions addressing socio-cultural barriers to women's diets are sustained, they are able to make the desired impact on communities in terms of improved knowledge and attitudes as well as creating community members' awareness of socio-cultural issues that contribute to women's poor diets. On the contrary, the low consumption of soya bean and other nutrient-dense foods augurs ill for WRA's diets partially because of their deprivation of the benefits of soya bean, a protein-rich food (Sanjukta & Rai, 2016). Additionally, women's non-access to grain barns could continue to contribute to women's poor dietary quality.

CHAPTER SIX

6.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

In this chapter, a summary of the study and main findings, their implications for women's diets, conclusions and recommendations are presented. Also, contributions the study has made to knowledge and areas for further study relevant to WRA's diets are indicated.

6.1 Summary of main findings

This study is a qualitative community participatory quasi-experimental research conducted in rural Northern Region of Ghana. The study adopted the social cognitive theory by Albert Bandura to explore how individual, community and environmental factors affect women's diets. Sixty-seven interviews were conducted using focus group discussions, in-depth interviews and key informant interviews among others at Yilkpene and Kpachilo in Savelgu-Nanton District at baseline. Thereafter, a community readiness assessment was conducted using the community readiness model as a tool.

The findings of the baseline and community assessment were used to design an attitudinal and social behavioural change intervention in consultation with key community stakeholders. The implementation of the intervention activities lasted a period of seventeen weeks. Assimilation over a period of three months was allowed before a post-evaluation of the intervention was carried out using the same data collection tools as baseline. Thematic analysis was conducted with emphasis on comparing results from baseline and endline to assess the changes resulting from the intervention. The main findings of the study were as follows:

1. Women's involvement in all aspects of the production chain was low owing to inadequate access to productive resources.
2. Women's non-access to food barns and incomes from household produce alongside their earnings of relatively-low and irregular incomes hinders their access to optimal diets.
3. The pro-male nature of utilization of food at the household level together with the scoping strategies adopted to mitigate the effects of food shortage are major barriers to women's optimal diets.
4. The overall readiness in the intervention community for an intervention addressing socio-cultural barriers to women's dietary quality was the stage of vague awareness-that is, some members of the community had begun to appreciate the sub-optimal quality and quantity of women's diets but, unfortunately, they lacked the motivation to do anything about the problem.
5. Dietary knowledge was sub-optimal at baseline but improved at endline in both communities
6. Perceptions on women's adequate dietary quality and its relations to women's reproductive health improved substantially after the intervention.
7. The intervention made positive change in dietary knowledge and practices despite low levels of coverage and community readiness.
8. The intervention also demystified socio-cultural food restrictions in plant-source foods during pregnancy and lactation.
9. The majority of women in both communities consumed at least four meals daily and micronutrient-dense foods were either not consumed frequently or were consumed in very small quantities at both baseline and endline.

10. More females than males could recall more key messages during post-intervention evaluation.

6.2 Implications of findings for women's diets

Women's diets will continue to suffer in terms of quality and variety if the socio-cultural barriers identified in this study are not addressed. Interventions addressing socio-cultural barriers have a high potential of achieving success if members of communities participate actively in the design and implementation process and support to sustain the intervention activities for long durations. Sustained intervention activities are feasible if existing community structures or resources are utilized in facilitating them. The link between agricultural productivity, nutrition and health must be strengthened since rural women's diets depend, to a large extent, on the local production of a variety of food items. The use of agro-chemicals needs to be critically examined and farmers educated on it. The need for communities, and women in particular, to gain more knowledge through education, either formally or non-formally, on dietary issues is critical for enhancing the quality of women's diets.

6.3 Conclusions

The following conclusions are drawn in reference to the objectives of the study:

Women in Savelugu-Nanton District interact closely with all aspects of the food system- that is, production, processing, preservation and storage, preparation, distribution and consumption; however, the pro-male nature of the food system serves as a strong barrier to women's optimal diets.

Sub-optimal dietary knowledge and attitudes hinder women's access to optimal diets at Yilkpene and Kpachilo. The situation is reflected in the conservative attitudes towards socio-cultural food restrictions on some animal-source foods and vegetables, thereby depriving women of some essential nutrients including micronutrients. A false feeling of women's dietary adequacy also emanates from their sub-optimal dietary knowledge and attitudes.

Some aspects of women's dietary practices at Yilkpene and Kpachilo, which are more or less uniform, do not promote their dietary status. The main factor responsible is their sub-optimal dietary diversity such as inadequate consumption of micronutrient-dense foods. The main drivers of women's dietary choices, which together contribute to depriving them of optimal diets, are mainly socio-cultural in nature - perceived healthiness of foods, food taboos and restrictions, tastes of foods, large sizes of households and sources of dietary information. Other factors are household food security situation and women's physiological statuses.

The enormity of the threat posed by socio-cultural barriers to women's optimal diets at Yilkpene is revealed by the low scope of readiness on the part of members of the community to modify them (the barriers). The situation might be traced to the entrenched nature of the barriers including women's low decision-making power on food resources, low levels of formal education, earnings of low, irregular incomes and large sizes of households.

Attitudinal and social-behavioural change communication interventions addressing socio-cultural issues require a lot of time and other resources to create remarkable

change in community knowledge and attitudes to women's diets. Adequacy of resources is necessary to engage communities to begin to reflect on their current practices and to assess how best to address them without compromising their cultural identity. Additionally, the findings indicate that adopting a participatory approach to nutrition and dietary intervention adds to the body of evidence that engaging communities to deliver dietary information leads to improvements in their levels of knowledge and attitudes (perceptions and beliefs).

6.4 Recommendations

Based on the results and conclusions of the study, the following recommendations are made to enhance WRA's diets in Savelgu-Nanton District:

Community

1. Women's interaction with the food system should be enhanced by assisting them to transport their produce through arrangements with men who have access to vehicles. This strategy would increase the quantities of foods available to the households as well as reduce the negative effects of heavy workload on women's health. In order to reduce the scope of loss through sun-drying, shade- and solar-drying should be encouraged especially in respect of green leafy vegetables. Fermentation of grains should not be limited to those used for porridges but extended to those used for other dishes such as TZ. Women should be assisted to acquire the specially-treated bags for storage of produce from the ministry of agriculture. They should also be educated on the importance of proper preservation and storage after drying.

2. To enhance women's diets through their dietary practices and choices as well as their interaction with the food system, conscious efforts must be taken by members of the communities to cultivate green-leafy vegetables for the home to sustain availability throughout the year. Perennial availability of the vegetables will assure women of their health benefits such as iron and vitamins. In this respect, members of the communities must be discouraged from thinking that *"one does not need to look for what one already has"* and rather begin to think more positively that *"one can actually improve upon what one already has while looking for what one has not but needs"* by consciously cultivating such crops during the peak periods of the year and embarking on backyard gardening during the dry season to ensure all year availability.
3. Community opinion leaders such as traditional rulers, religious leaders and health volunteers should organize activities to raise and sustain members' readiness to modify socio-cultural norms that act as barriers to women's diets. Relevant activities include public fora, home visits and group meetings, which will sustain community members' attention on issues at stake and, thus, motivate them to deal with the issues on a sustained basis.
4. Identification of religion, culture and superstition as the forces behind the food taboos points to the need to adopt taboo- and restriction-specific strategies to tackle them. The culture-related taboos and restrictions could be modified, presumably, through the co-operation of traditional community leaders and heads of households. The superstition-related taboos and restrictions require the creation of awareness about the health benefits of the taboo foods. Food taboos

and restrictions on women's diets would, thus, be mitigated only through an intervention that caters for established socio-cultural structures of power, authority and communality.

Ghana Health Service and the media

1. To enhance community members' dietary knowledge and attitudes, Ghana Health Service should implement sustained dietary education through community-based interventions, ANC and PNC sessions as well as advocacy on socio-cultural barriers to women's diets. GHS needs to work in collaboration with the media for the interventions to benefit from the latter's immense influence on public opinion and mass mobilization. The roles of the media as key educators and providers of information should be utilized by GHS to enhance the effectiveness of its interventions targeted at socio-cultural barriers to women's diets especially in relatively lowly-populated rural communities in which members have close interactions. The collaboration will, thus, enhance dietary knowledge and attitudes in the district. Women's diets will, again, benefit from the interaction through improvements in women's interaction with the food system, their dietary practices and choices.
2. Adverse effects of the sale of legumes and nuts, which constitute the main nutrient-dense foods in the communities, on women's dietary quality need to be addressed through nutrition educational activities of Ghana Health Service. The activities should include the education of members of communities, particularly men, who are customarily the heads of households about the health benefits of these products and the need to reserve sufficient quantities for home consumption. Improved awareness and knowledge of the nutritive benefits of

anchovies, green-leafy vegetables, legumes and nuts would encourage WRA to consume them more frequently. In general, frequent consumption of fruits such as water-melon, one of the seasonal fruits cultivated in the communities, and meat, a rich source of iron, could help to improve women's dietary quality and micro-nutrient status.

3. Ghana Health Service should organize training for local health volunteers on nutrition and healthy dietary practices. Improved dietary knowledge and attitudes among local facilitators would enhance the effectiveness of the behavioural change interventions that the service should organize with the media and other stakeholder-organizations.
4. The interventions should exploit relevant results from the study. An example is the finding that deviant WRA experienced neither spiritual nor physical (health) side-effects of their consumption of the restricted foods.
5. The coping strategies adopted by women to mitigate the effects of food shortages call for WRA-friendly strategies. These strategies include backyard cultivation of green-leafy vegetables in the dry season and improved preservation and storage of farm produce to improve women's access to adequate diets.
6. The findings on community members' dietary knowledge and attitudes call for interventions to enhance awareness of women's diets to be linked with their preferred foods and their methods of processing, preservation, storage and preparation. The enhanced awareness would motivate consumption of healthier foods to improve their nutritional status. Additionally, a communication intervention would be useful to enhance participants' knowledge of dietary

qualities of less-preferred foods and, thus, eliminate misperceptions regarding such foods.

7. Strategies to enhance WRA's diets should take due cognisance of the seven drivers identified in the current study that influence women's choice of food. Neglect of any or some of the drivers would not augur well for WRA's dietary status because of the inter-relationships among them.

NGOs in Savelugu-Nanton District: RING, RAIN, World Vision and other institutions

1. To ensure that women's diets benefit adequately from their interaction with the food system, the acquisition of farming inputs needs to be enhanced through more access to credit facilities for both men and women. There is also the need for women to have improved access to their male household members' labour through negotiations and hired labour through access to improved credit facilities.

2. Sale of foods at both farm gates and external markets requires the empowerment and mobilization of local women through producers' (farmers') co-operatives and other groups. These measures would offer them strong bargaining power and greater levels of financial security against shocks such as unfavourable climate and transport difficulties. Women's relatively-low incomes hinder their performance of their roles such as milling the grains allocated by the men and acquiring ingredients for soups and sauces. This deficiency, which leads to poor quality of diets for the households in general and women in particular, would be mitigated through improved earnings.

3. There is also the need to empower women to add value to their produce through improved techniques of production, processing and preservation. This strategy would help to raise their levels of income.

6.5 Contributions to knowledge

One key contribution this study has made to the existing body of knowledge is that the local food system in rural Savelgu-Nanton District is driven by gender and socio-cultural norms, which put women at a disadvantage in respect of their access to food resources at the household level. These inequities need to be addressed holistically if women's dietary quality is to reach optimal levels on a sustained basis. Second, even though community readiness and intervention coverage may be low in community-based interventions, the interventions may still be successful if other process indicators such as level of community participation and community perceptions of the intervention are assessed using qualitative methods. Third, in spite of modernization and extensive facility- and community-based nutrition and dietary education, women's diets still suffer from food taboos in most rural communities.

Theoretical contribution

The CRM had previously been used mostly in public health related interventions such as management of obesity and weight, HIV/AIDS and domestic violence but not in an intervention addressing socio-cultural barriers to women's optimal diets. This study has demonstrated that the model can be effectively used in public health-related interventions in which sustainability is usually a daunting challenge.

The study combined the SCT and CRM in the design and implementation of a community-based behavioural change communication intervention to complement each other. While the SCT focused on inter-personal self- and collective-efficacy to accept, modify and sustain change, the CRM concentrated on the readiness of a community to effect and sustain change in attitudes and, eventually, behaviour. The theoretical contribution of the study to knowledge is, thus, that combining the two models in community-based interventions could lead to increased community participation and ownership of the intervention.

Methodological contribution

Perhaps for the first time, and to the best of my knowledge, an intervention study in Ghana has applied the CRM to determine the stage of readiness of a community to implement an intervention to address a public health issue. The five dimensions by which the stage of readiness of the community was assessed were relevant in determining whether its resources and structures could be effective to implement and sustain the intervention especially when it involved socio-cultural issues. The study led to the design and development of a communication strategy through a participatory approach to addressing socio-cultural barriers to women's diets in a typical rural setting.

Policy contributions

The study gives credence to the fact that if communities are given the necessary support by researchers, they can design and implement context-and culturally-specific interventions to address issues affecting them.

Implications for further research

A mixed methods approach to a similar study is suggested since this study was unable to state quantitatively the extent to which dietary knowledge and attitudes improved at the post-intervention stage. Additionally, women reported adopting improved methods of preparation of food and non-adherence to restrictions against the consumption of slimy foods at post-intervention stage but the scopes of these changes could not be verified quantitatively.

6.6 Limitations of the study

The study used only qualitative methods in data collection and analysis and, therefore, was unable to quantify the margins of change in the indicators measured. For instance, even though knowledge improved in both communities, the study could not indicate the proportion of participants whose knowledge improved. The 24-hour dietary recall could only recall the foods women consumed the previous day, which may not be a true representation of all the varieties of foods they usually consumed.

Second, the design of the intervention, quasi-experimentation, which does not allow participants equal chance of being assigned to the different groups, may have introduced selection bias into the study. Last but not least, the intervention suffered from information contamination through similar activities introduced into the comparison community, which may have accounted for the improved outcome indicators there.

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APPENDICES

Appendix A: Key Informant Interview Guide on the Food System

Target respondents will include District agricultural extension officer, men and women farmers, community elders, District nutrition officer, community volunteer

Respondent's /ID.....

A: Participants' socio-demographic background

Name of Community Category of respondent.....

Respondent's sex..... Age..... Religion.....

Educational level completed.....Marital status

Occupation.....

Place of work.....

Size of household.....

Respondent's average weekly/monthly income.....

B: Understanding the food system

Food production

1. What foods are produced in this community?
(Probe for production of crops and animals across different food groups: cereals, vegetables, roots and tubers, fruits, fish, poultry, livestock, etc.). Use table below to ask further questions on food items mentioned and their characteristics.

Free list record form for foods produced in community and characteristics

Traditional food item/food name	Food group (grain/cereal, meat/fish, vegetable, fruit, etc.	Varieties	Seasonality (all year round or some parts of the year)	Time of year harvested	Cultivated or wild	Part of local diet?	Frequency of use	Perception of nutritive/health value or quality of foods

2. For foods which do not form part of the local diet, what happens to them when they are harvested?

3. Are there foods which form part of your local diets but which are not produced in this community? (Also probe for food items such as sugar, magi and skimmed milk)
4. What are the sources of these other foods?
5. What resources are required for the production of these foods?
Probe for:
 - a) Inputs such as seeds, fertilizers and implements
 - b) Land; how is land accessed and controlled?
 - c) Labour;- what is your source of labour for farm work? Hired, household members' labour members? What activities are performed by men and women?
 - d) Are there any crops and animals produced by men or women? If so, why is it so?

Food processing, preservation, storage and distribution

6. When crops are produced/harvested from the farm or animals mature, what happens to them? Probe for:
 - a) Processing techniques/methods
 - b) Food storage, food barns and other facilities
 - c) Marketing/distribution: are there foods that are produced mainly for cash? Where are they marketed and who does the marketing?
 - d) Are some of the foods given out as gifts? If so who are the beneficiaries?
 - e) What happens to the animals reared in this community when they are mature?

Food Consumption and preparation

7. In a typical home, how is food prepared for consumption? Probe for:
 - a) Who prepares the food and why?
 - b) When is food prepared and how is it shared among members of households (who is served first and who is served last, which people eat together and who eat alone and why? Who shares the food when it is prepared and why?

Food security

8. How easy or difficult is it to have enough food to be eaten by everyone in the community?
 - a) Food availability: Is food available all year round? In what time of the year is food abundant in this community? When is food scarce in the community? How does scarcity of food affect: 1) household diets 2) women in this community?
 - b) How do people cope during times of food shortages in the community?
 - c) What is your perception of the cost of food? Probe:
 - i) During harvest?
 - ii) After harvesting and other periods of the year?
 - d) What foods do community members have preference for or like? Why are these foods preferred to others?
 - e) Are there foods community members do not generally like but eat anyway? What is it about the foods that make people dislike them? When are these foods usually consumed?

- f) How do community members get the money to acquire food? (Probe for different sources of income to acquire food).

**Appendix B: Key informant and FGD interview guide on community perceptions of
intervention activities**

Target participants: Participants in the intervention

- 1). What were some of the messages you heard about?
- 2) Which of the messages have you been able to practise?
- 3) Which messages have you not practised and why?
- 4) What are the benefits of the intervention to the community?
- 5) What are some of the challenges you had with the intervention?

Appendix C: Assessment of community readiness to address women's dietary challenges

Target respondents will include chief, Assemblyman, men and women leaders, social workers, NGO representative in community, teachers, healthcare workers, volunteers and community members

Background Characteristics

Category of respondent..... Sex... Respondent's Age.....

Educational level completed Marital status.....Size of household....

Religion..... Occupation.....

Respondent's average weekly/monthly income

1. Knowledge about the issue of women's poor dietary quality

- a. What do members of the community think about women's diets? (Probe: Are women's diets adequate in terms of nutrients and quantity? Please explain your response)
- b. What do you think are the causes and consequences of women's poor dietary quality?
- c. How does women's poor dietary quality affect them and the community at large?

2. Community efforts to addressing women's poor dietary problem

- d. What activities/programmes are in place to address challenges to women's diets in the community? (health facilities and community tradition?)
- e. What activities are carried out by community volunteers to address the issue?
- f. Are these activities effective in managing women's dietary problems?
- g. Are these activities community-wide such that all segments of the community are reached?

3. Leadership

- d. Are community leaders in support of the activities?
- e. How is this support shown? (What are they doing to support the activities?)

4. Community climate

- a) How do community members feel about the issue? (Probe: Do they think they can do something about the problem?)
- b) If they can, what do they think they can they do about the problem?
- c) Do they think others can help solve the problem? (Probe for who can help?)

5. Resources related to the issue

- a) What resources are available to support intervention activities addressing the problem of women's diets? (Probe for people who have the time to be trained to deliver BC messages, money to support activities, existing programmes to tag on BC activities child welfare activities, social and religious programmes, etc)

Appendix D: Qualitative 24-hour recall guide

Target respondents: Women of reproductive age

Respondent ID

A. Participant's socio-demographic characteristics

Community

Respondent's Age..... Religion.....

Physiological status.....

Educational level completed.....

Current primary occupation.....

Place of work.....

Size of household

Respondent's average weekly/monthly income.....

B. Women's Time use

Tell me about all the activities you carried out yesterday from the time you wake up until the time you went to bed at night.

C. 24-hour recall of foods consumed

Now, I will like us to discuss all the foods you ate yesterday from the time you first woke up until the time you went back to sleep at night. After getting all the foods you ate yesterday, we will then go over each of them to talk about the time they were eaten, whether they were bought or home prepared, how they were prepared and the quantity you ate.

1. What was the first food you ate when you woke up yesterday?

2. What time did you consume this food?

(Go through respondent's eating activities for yesterday and ask for all meals, drinks, snacks and other foods she ate for the rest of the day till she went to bed at night).

Name of Food/meal	Description of dish (ingredients etc.)	Time of day consumed	Purchased or Home prepared	If home prepared, how is this food prepared?	If purchased how much	Amount consumed (using household measures)

4. Was food(insert name of food) purchased or home prepared?

5. Kindly tell me what ingredients were used in preparing the food.....(insert name of food)?
6. How is food.....(insert name of food) prepared.
7. Who else consumed (insert name of food) with you in the household?

Appendix E: In-depth interview guide on food ownership and utilization at the household level

Target respondents: Women of reproductive age

A: Sources of food acquisition and decision-making regarding household food

1. Where do you usually acquire the above-listed foods from? (Refer to the 24-hour recall by each respondent. For each of the foods/meals mentioned, probe for its source to the point of production)
2. How are decisions made about food consumed at home and why? (Probe for whose responsibility it is to provide food items for the home, role of men and women, husbands and wives in feeding the household)
3. Who is responsible for preparing food for the family and why?
5. If you have to purchase the ingredients for preparing food, who goes to purchase them?
6. How are you able to buy food? (Probe for access to resources/money to buy food?)
7. Apart from buying food, how else are you able to access food?

B Food distribution/sharing and eating schedules at the household level

1. How is food shared for the household after it has been prepared?
(Probe for: a). Who is (are) responsible for sharing the main dish/meal in the household after it has been prepared? Does a different person apart from the one who prepared the main dish share the dish? (Probe for reasons)
a) Describe what happens during meal times, e.g. eating together, etc.?
(Probe for: who eats with who in the household? Women and men: similarities and differences in what they eat?)
b) When the family eats together,
a) Who is served first when the dish is prepared? Why is this person or persons served first? b) Who is served last and why?
C) Which people eat together from the same bowl and why? Which people eat separately and why?
c) Are there times when you eat away from home? When are these times and what will you normally consume? What are the sources of the foods?

Appendix F: Focus group discussion guide (Community men and women)**A. Demographic Characteristics**

ID No.	Age	Marital status	No. of children	HH size	Physio.	Education	Occup	Average weekly/monthly income	Religion
01									

B. Community knowledge, attitudes and beliefs about food and nutrition and health**Food choices and preference**

1. What are the foods/meals people like to eat in this community? (Probe for different kinds of food and explain why these foods are preferred)
2. What foods do members of the community not like? (Probe for all foods not liked and discuss the reasons).
3. Are there foods members of the community like but do not eat? List them and explain why you do not eat them. (Probe: Are there foods pregnant or lactating or children like but do not eat them because of their physiological stage or gender? Why can't they eat such foods?).
4. Are there foods the community does not like but eat them? (Probe for these foods and discuss reasons)
5. Are there foods pregnant and lactating women do not like but are made to eat because they are pregnant/lactating?
6. What about children and the aged?

Food taboos, beliefs and norms**7. Vignette**

In almost every community, there are food taboos different segments of the population adhere to. For instance, in upper East region, women are not allowed to eat fowls, pregnant women are not allowed to eat groundnut or groundnut soup for fear they may not be easily delivered of their babies and children are not allowed to eat eggs for fear they might end up becoming thieves in the future.

a) What is the situation in this community? Are there certain foods in this community (in the past or present) that some categories of persons are not allowed to eat? (Probe for pregnancy, lactation, adolescents, the aged, children and the sick. explain the nature of these taboos. What are the reasons for the taboos?)

- b) Are these taboos being practised currently? Which ones are practised and which category of people practise them and why? Why are the others taboos no more practised?

Health and nutrition

8. Vignette:

Our health workers recommend that a pregnant woman should visit the midwife at least four times before she gives birth. This measure is to ensure that the woman will be healthy and the baby will be healthy at birth and also grow well. They also recommend that pregnant and lactating mothers eat well to enhance their health and that of their children.

- a) Tell me about what foods women need to enhance their health. (Probe for: pregnant women, lactating women, adolescent girls and other categories of women of reproductive age. Further probe for what they have been told at the health facility and what is traditionally known or local knowledge)
- b) Tell me about foods that are healthy. What are the attributes of healthy foods?
- c) List such foods and perceptions of their health and nutritive values (Probe for what they learnt from the health facility and what they learnt from other people in the community and what tradition has handed down to them,
- d) Are some of these foods produced in the community? List them. How else can they be accessed?

Appendix G: Observations of women's time use (household level: from 6am to 6pm)

Target Respondents: Women of reproductive age

Respondent's ID.....

Background Characteristics

Community.....

Respondents Age..... Physiological status.....

Educational level completed.....

Current primary occupation.....

Place of work.....

Size of household

Respondent's average weekly/monthly income.....

Items and Activities to observe

- Time and duration of observation (Start and end time)
- Number of people in household
- Physical environment of household (hygiene and sanitation, etc.)
- Types of foods consumed in the household
- Cooking processes and people involved in cooking
- Food items used in cooking and sources of each food item
- Food distribution/sharing among members of households
- Eating schedules and arrangements
- Social interactions during eating
- Men's role in food preparation/ distribution/sharing processes
- Time spent by women doing household chores and commercial activities
- Women's eating patterns: frequency of eating, time of eating types of food consumed, etc.
- Time spent resting during the day

Appendix H: Observational Checklist (Community level)

Activities to observe and interact with:

- Number of compounds in community
- Transportation and communication channels and patterns
- Livelihood activities in community
- Men's daily activities
- Women's daily activities
- Other household members' daily activities
- Availability of the ff. facilities: educational, health, markets, water sources, sanitation, recreational, nutrition programmes especially for women
- Presence of other organizations -e.g. NGOs
- Observation of ceremonial activities such as market days, funeral, outdooring/naming/ marriage and gender-based roles in these events and food use
- Farming, processing, food storage facilities such as food barns, food distribution channels, food vending activities, etc.

Appendix I: Participant's Consent Form

Study title: A formative study of community perceptions and strategies to improve women's dietary quality in Savelgu-Nanton District, Ghana

Student Investigator: Sawudatu Zakariah

Address: School of Public Health, Post Office Box 581, University of Ghana, Legon

Introduction

My name is Sawudatu Zakariah, a student of School of Public Health, University of Ghana. I am undertaking this research as part of the requirements for the award of a PhD Degree in Public Health. To be sure that you understand what you are getting yourself involved in, I have summarized the purpose of this study to make it easy for you to understand and to make an informed choice about either taking part or not taking part. If after the explanation you still feel uncomfortable about participating, you still have the right not to be involved. However, if you agree to be part of this research, then you are required to sign or thumbprint this agreement for us.

General information about Research

This research is about women's eating practices and how our beliefs about food influence what they eat. In Ghana, women's diets in particular are influenced by what people know and understand about food and its effect on their health so some categories of women are restricted from consuming certain foods which are considered taboos or harmful to their health. Because of this restriction, women's diets are not well balanced (limited in quality and variety) - leading to poor nutritional statuses. We, therefore, need solutions that will address our beliefs and practices that affect our women's diets negatively. This study is aimed at identifying these social and cultural barriers and bringing the community together to find ways of modifying these practices in order to improve women's diets.

If you agree to be part of this study, then I will take about one hour of your time to discuss some of the issues.

Possible risks:

This study is a minimal risk study. Apart from spending some time discussing these issues, this study does not pose any risks to participants.

Possible benefits

There are no immediate rewards from this study for participation. However, in the long run, the findings will help inform policies on more appropriate solutions for our health.

Confidentiality

The information you give us will be kept confidential. No names of participants will be seen in our reports and the data will be used solely for the purpose for which it is collected.

Contact for additional information

If you need further information or persons to contact concerning this research, kindly contact:

Sawudatu Zakariah

School of Public Health,

University of Ghana, Legon

Cell phone number: 0268628793 or email: sodeyakoto@gmail.com

If you agree to be part of this study, please, sign or thumb print.

Participant:.....

Researcher:.....

Appendix J: Child Assent Form

Introduction

My name is **Sawudatu Zakariah** and I am from the *School of Public Health* at University of Ghana. I am conducting a research study entitled “ ***A formative study of community perceptions and strategies to improve women’s dietary quality in Savelgu-Nanton District, Ghana***”. I am asking you to take part in this research study because I am trying to learn more about *our community norms that prevent women and young girls attaining optimal diets*. This will take *about one hour of your time*.

General Information

This research is about dietary practices of women who are in their child-bearing age and how our beliefs and usual practices influence what women eat. In Ghana, women’s diets in particular are influenced by what people know about food and its relationship to their health so some categories of women are restricted from consuming certain foods which are considered taboos or harmful to their health. Because of this restriction, women’s foods are not well balanced (limited in quality and variety) - leading to poor nutritional statuses. We, therefore, need solutions that will address our beliefs and practices that affect our women’s diets negatively. This study is aimed at identifying these social and cultural barriers and bringing the community together to find ways of modifying these practices in order to improve women’s diets.

If you agree to be in this study, you will be asked to participate in group discussions and one-on-one interviews to discuss these issues.

Possible Benefits

Your participation in this study has no immediate rewards. However, in the long run, the findings will help inform policies on more appropriate solutions for our health.

Possible Risks and Discomforts

Apart from spending about an hour of your time discussing issues, this study does not pose any risks to you.

Voluntary Participation and Right to Leave the Research

You can stop participating at any time if you feel uncomfortable. No one will be angry with you if you do not want to participate.

Confidentiality

Your information will be kept confidential. No one will be able to know how you responded to the questions and your information will be anonymous.

Contacts for Additional Information

You may ask me any questions about this study. You can call me at any time [*insert contact information*] or talk to me the next time you see me.

Please talk about this study with your parents before you decide whether or not to participate. I will also ask permission from your parents before you are enrolled into the study. Even if your parents say “yes”, you can still decide not to participate.

Your rights as a Participant

This research has been reviewed and approved by the Institutional Review Board of Noguchi Memorial Institute for Medical Research (NMIMR-IRB). If you have any questions about your rights as a research participant you can contact the IRB Office between the hours of 8am-5pm through the landline 0302916438 or email addresses: nirb@noguchi.mimcom.org

VOLUNTARY AGREEMENT

By making a mark or thumb printing below, it means that you understand and know the issues concerning this research study. If you do not want to participate in this study, please do not sign this assent form. You and your parents will be given a copy of this form after you have signed it.

This assent form which describes the benefits, risks and procedures for the research titled “*A formative study of community perceptions and strategies to improve women’s dietary quality in Savelgu-Nanton District, Ghana*” has been read and or explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate.

Child’s Name:..... Researcher’s Name:.....

Child’s Mark/Thumbprint..... Researcher’s Signature:.....

Date: Date:

Appendix K: Parental Consent Form

Study title: A formative study of community perceptions and strategies to improve women's dietary quality in Savelgu-Nanton District, Ghana

Student Investigator: Sawudatu Zakariah

Address: School of Public Health, Post Office Box 581, University of Ghana, Legon

Introduction

My name is Sawudatu Zakariah, a student of the school of Public Health, University of Ghana. I am undertaking this research as part of the requirements for the award of a PhD Degree in Public Health. To be sure that you understand what your child is getting herself involved in, I have summarized the purpose of this study to make it easy for you and your child to understand it and to make an informed choice about either taking part or not taking part in the study. If after reading it (or it being explained to you) you do not understand anything, you may ask for more explanations. If after the explanation you still feel uncomfortable about your child participating, you still have the right not to involve her. However, if you agree for your child to be part of this research, then you are required to sign or thumb print this agreement on her behalf.

General information about Research

This research is about dietary practices of women who are in their child-bearing age including young girls like your child who has not yet given birth but is in the process of getting to the stage of motherhood. In Ghana, women's diets in particular are influenced by what people know and understand about food and how it affects their health so some categories of women are restricted from consuming certain foods which are considered taboos or harmful to their health. Because of this restriction, women's diets are not well balanced (limited in quality) - resulting in poor nutritional status. We, therefore, need solutions that will address our social practices that affect our women's diets negatively. This study aims to identify these social and cultural barriers to women's optimal diets and bring the community together to find ways of modifying these practices in order to improve women's diets.

If you agree for your child to be part of this study, then I will take about one hour of her time to discuss some of the issues.

Possible risks

A part from spending some time discussing these issues, this study does not pose any risks to participants.

Possible benefits: There are no immediate rewards from this study for participation. However, in the long run, the findings will help inform policies on more appropriate solutions to our nutritional problems.

Confidentiality

The information she gives us will be kept confidential. No names of participants will be seen in our reports and the data will be used solely for the purpose for which it is collected.

Contact for additional information: If you need further information or persons to contact concerning this research, kindly contact:

Sawudatu Zakariah, School of Public Health, University of Ghana, Legon. Cell phone number: 0268628793 or email address: sodeyakoto@gmail.com

If you agree for your child to be part of this study, please, sign or thumb print.

Your child's rights as a participant

This research has been reviewed and approved by the Noguchi Memorial Institute for Medical Research Institutional Review Board (NMIMR-IRB). If you have any questions about your child's rights as a research participant you can contact the IRB Office between the hours of 8am and 5pm through the landline 0302916438 or email address: nirb@noguchi.ug.edu.gh

VOLUNTEER AGREEMENT

The above document describing the objective and purpose of the study, the benefits and risks as well as the procedures of the research titled "a formative study of community perceptions and strategies to improve women's dietary quality in Savelgu-Nanton District, Ghana" has been read and explained to me. I have been given the opportunity to have any questions about the research answered to my satisfaction. I agree that my child should participate as a volunteer.

Date

Parent/guardian's name and
signature/thumb print

If volunteers cannot read the form themselves, a witness must sign here:

I was present while the objective, purpose, benefits, risks and procedures of the research were read to the child's parent/guardian. All questions were answered and the child's parent/guardian agreed that his/her child should participate in the research.

Date.....

Witness' name and signature/thumb print

I certify that the nature and purpose, the potential benefits and possible risks associated with participating in this research have been explained to the above individual.

Date.....

Name and signature of person who obtained
consent

Appendix L: Intended Action plan for implementing attitudinal and behaviour change to improving women's diets

Week/Activities	Audience	Channels	Content of act.	Durations	Responsibility	Expected outcomes/results
Week 1 Consensus meeting with community stakeholders	District nutrition officers, community health volunteers, extension officer, opinion leaders, personnel in women in agriculture, NGO reps. in community	Stakeholders meeting	Baseline results and designing intervention)	Two days	PI	Consensus on challenges facing women's diets Design of intervention messages to address challenges
Week 1 Comm. sensitization	Whole community	Community Durbar	Sensitization of comm. about intervention	Two hours	Implementation Team	Support and participation of community in BCC activities -Importance of good sanitation
Week 2 Training of community volunteers and research assistants	8 community volunteers, four research assistants	Training workshop	Training on messages and data collection	Two days	PI	Improved understanding and ability to disseminate messages to target audience
Week 3 Meetings with men and women	WRA, older women, adolescent girls, Husbands, heads of households, young men, fathers, etc.	1 st Group meeting	Key message 1: Importance of combining and consuming a variety of foods in meals to improve the quality of women's diets	One hour	Implementation team	-Understanding the nutritive benefits of foods produced in community -Need for women to eat a variety of foods -Need for women to eat a combination of foods of good qualities in good quantities -Importance of good sanitation
Week 4	WRA, older women,	2 nd Group	Key message 2:	One hour	Implementation	-Importance of women's diets

Meeting with men and women	Adolescent girls, husbands, heads of households, young men, fathers, etc.	meeting	Importance of women's diets to their health and reproductive health outcomes;		ion team	and their reproductive health development --Understanding the effects of poor diets on women's health and reproductive outcomes -Importance of good sanitation
Week 5 Meetings with men and women	WRA, older women, adolescent girls, husbands, heads of households, young men, fathers, etc.	3 rd Group meeting	Key message 3: Modification of unfounded food beliefs, taboos and other food discriminatory dietary practices against WRA	One hour	Implementat ion team	Understanding the importance of women's social and economic status in household food provision and consumption -Addressing all forms of food discrimination against women
Week 6 1 st set of home visits	Households/compounds with WRA	Visits to households/ compounds	Review of messages	Two hours	Implementat ion team	Addressing all forms of dietary discrimination against women
Week 7 Meeting with men and women	WRA, older women, adolescent girls, men in community including husbands, heads of households, young men, fathers, etc.	4 th Group meeting	Key message 4: importance of empowering women to have control over resources to enable them to improve their dietary quality	One hour	Implementi ng team	Understanding the importance of women's social and economic status in household food provisions and consumption
Week 8 Home visits	Households /compounds with WRA	Visits to households/ compounds	Review of messages	Two hours	Implementat ion team	-Adoption of behavioural change communication messages

Week 9 Meeting with men and with women	WRA, men, older women	5 th Group meeting	Key message 5: importance of improving methods of food preservation and preparation to enhance the quality of women's diets	One hour	Implementation team	Importance of preservation of food
Week 10 Food demonstration	WRA, older women and adolescents	Group cooking	Processing of soya bean into flour for fortification of household meals	Two hours	Implementation team	Learning other ways of using legumes, particularly soya bean at home to improve qualities of diets -Learning about other leafy vegetables and their consumption
Week 11 Food demonstration	WRA	Group cooking	Using soya bean in a variety of local dishes	2 hours	Implementation team	Learning other ways of using legumes, particularly soya bean at home to improve qualities of diets -Learning about other leafy vegetables and their consumption
Week 12 Community sensitization	Whole community	Community durbar	Review of messages and sustainability of intervention,	2 hours	Implementation team	Outcome of intervention activity for the past 12 weeks and way forward

Note: Key message 6 runs through the whole period of the intervention

Appendix M: Implemented action plan for attitudinal and behaviour change to improve women's diet

Week	Activity/topic/content	Audience	Channels	Durations	Responsibility	Outcomes
Week 1	Consensus meeting with community stakeholders	District nutrition officer, community health nurse, community health volunteers, agric. extension officer, community opinion leaders, chief and elders, research assistants	Stakeholders meeting	Two days	PI	Consensus on challenges facing women's diets
	Comm. sensitization on baseline findings and intervention	Whole community	Community durbar	Two hours	Stakeholders and PI	Design of intervention messages and channels of communication Selection of community volunteers to partner research team to implement intervention Support and participation of community in BCC activities
Week 2	Training of community volunteers and research assistants on messages	Community volunteers, four research assistants	Training work shop	2 days	PI	Improved understanding and ability to disseminate messages to target audience
Week 3 :	(1st grp. Meeting)	WRA, older women, adolescent	Group	One and	Implementation	Outcome-

	Introductory message on importance of growth and development	girls, Husbands, heads of households, young men, fathers, etc.	discussion	half hours	team	Improved understanding of the nutritional benefits of foods produced in community and their
Week 4:	(2nd grp meeting) Key message 1: Women need a variety of foods in their diets for good health and wellbeing	WRA, older women, adolescent girls, Husbands, heads of household, young men, fathers, etc.	Group discussions	One and a half hours	Implementation team	Outcome: Improved understanding of the nutritional benefits of foods produced in community -Improved understanding of the need for women to eat a variety of foods -Improved understanding of the need for women to eat combinations of food of good qualities in good quantities
Week 5:	(3rd grp meeting) Key message 2: Combining and consuming a variety of foods in our meals improve the qualities of our diets	WRA, older women, adolescent girls, Husbands, heads of households, young men, fathers, etc.	Group discussions	One and a half hours	Implementation team	Outcome: Improved understanding of the importance of consuming a variety of foods

Week 6:	(4th grp meeting) Key message 3: Women's diets are important for their health and reproductive health outcomes	WRA, Older women, adolescent girls, husbands, heads of households, young men, fathers, etc.	Group discussions	One hour	Implementation team	Outcome: Improved understanding of the importance of women's diets and their reproductive health development --Improved understanding of the impact of poor diets on women's health and reproductive outcomes
Week 7 :	(5th grp meeting) Key message 4: Address unfounded beliefs and taboos and discriminatory practices to help improve women's diets	Husbands, heads of households heads, young men, fathers, women, adolescent girls	Group discussion	On and a half hours	Implementation team	Outcome: Discouraging food-related discriminatory practices against women and children Discouraging food restrictions against pregnant and lactating women
Week 8:	(6th grp meet) Review of messages 1 through 4 First Home-visit	Husbands, heads of household, young men, fathers, women, adolescent girls Compounds in community	Group discussion One-on-one discussion with	One hour Two hours	Implementation team Implementation team	Reinforcing messages Adoption of behaviour change

			households			communication messages
Week 9th	(7th grp meet) Key message 5: Empower women to have control over resources so they can improve their dietary qualities	WRA, older women, adolescent girls men in community including Husbands, heads of households, young men, fathers, etc.	Group discussion	One hour	Implementation team	Outcome: Improved women's access to productive resources Improved understanding of the importance of women's social and economic status in household food provision and consumption Improved men's understanding of the need to support women to be economically self-sufficient
Week 10	(8th grp meet) Key message 5: Empower women to have control over resources so they can improve qualities of their diets	WRA, older women, adolescent girls, men in community including husbands, heads of households, young men, fathers etc.	Group discussion	One hour	Implementing team	Understanding the importance of women's social and economic status in household food provision and consumption
Week 11	(9th grp meet) Review of messages Second Home-visits	All participants Compounds in community	Group discussion Home visits	One hour Two hours	Implementation team	Outcome: Reinforcing messages Adoption of behaviour change communication messages

Week 12	:(10th grp meet) Reviewed messages on importance of women's diets	WRA, older women, adolescent girls, men in community including husbands, heads of households, young men, fathers, etc.	Group discussion	One hour	Implementation team	Outcome: Improved understanding of effects of women's diets on their health and well-being
Week 13	Sanitation day	Whole community	Clean-up exercise	Two hours	Community members	Outcome: Improved community sanitation
Week 14	(11th grp meet) 11th Group meeting	Men and women	Group discussion	1 hours	Community volunteers	-Adoption of behaviour change communication messages
Week 15	(12th grp meet) 12th Group meeting	Men and women	Group discussion	1 hours	Community volunteers	Learning other ways of using legumes particularly soya beans at home to improve qualities of diets -Learning about other leafy vegetables and their consumption
Week 16	Key message 6: Improving food preservation and preparation: Training and demonstration on Prevention of post-harvest losses and preservation of farm produce	Men and women in community	Presentation , video show and demonstration	2 hours	Ministry of Agric. extension services	Outcome: Improved food preservation practices
Week 17	Cooking demonstration	Women and men	Group	3 hours	PI and personnel	Improved qualities of foods

			cooking		from Women in Agriculture	prepared at home by encouraging use or addition of soya bean in all household foods, prepared, improved cooking of vegetables, encouraging the consumption of fermented TZ
Week 17	Week17 Community Durbar	Whole community	Community durbar	Two hours	PI	Outcome: Sustainability of intervention activities

Appendix N: Messages disseminated

Table 2: BC communication messages addressing challenges to women's diets

Issues and challenge	Current behaviour/evidence	Communication messages	Key message
Sub-optimal knowledge and perceptions about foods	Women's diets were found to be inadequate in variety and the 24-hour recall of women's diets confirmed this finding	1. The foods we produce are of different kinds; each provides the body with unique nutrients for energy, protection and health and, last, child growth (when pregnant or breastfeeding): <u>Energy foods:</u> cereals, grains and roots/tubers: maize, rice, millet, guinea-corn, yams, cassava and sweet potato <u>Health and Protective foods:</u> green leafy vegetables: ayoyo, bra, kuka, alefu, cassava leaves Other vegetables: tomato, okro, pepper, garden-egg Fruits: mango, shea fruit, dawadawa fruit, ebony fruit (gaya), sinsaba (...), pawpaw, water-melon, orange, banana, pineapple <u>Growth foods:</u> legumes/seeds/nuts: groundnuts, beans, adua, bambara, soya bean, neri, kanton, agushie, dawadawa seed Meat/fish: goat, sheep, cattle, chickens, guinea fowl, rabbit 2. Consumption of a combination of any of these foods in our meals on a daily basis will give us the different nutrients we need to grow and work hard. Consume different vegetables and fruits at different meals when in season because of the varying amounts of micro-nutrients contained in the different vegetables/fruits. Both men and women should cultivate a wider variety of foods for household consumption. 3. Consume a lot of legumes and anchovies: <u>good</u> sources of iron.	Combining and consuming a variety of foods in our meals improve the quality of our women's diets.

		<i>Eat enough to meet energy and nutrient needs.</i> <i>4. Beverages like tea (without sugar) do not contain energy or nutrients; they only fill the stomach.</i> <i>5. However, not eating a combination of these foods can make us get the following health conditions:</i> <i>Iron-deficiency anaemia: not enough quantity of iron in the body to make blood leading to tiredness, low productivity, birth complications</i> <i>IDD (iodine deficiency disorders): Inadequate consumption of iodine causes goitre, brain damage to the foetus, dwarfism</i> <i>Vitamin A deficiency: eye problems leading to blindness, dry skin, severe hair loss, etc.</i>	
2. Poor knowledge about women's diets and its relationship to women's reproductive health outcomes	Even though communities were aware poor diets affected women's health, majority were not aware it affected women's reproductive health outcomes.	<i>6. Adolescent girls need good diets to develop well.</i> <i>Focus especially on adolescent girls between the ages of 9 and 19 years.</i> <i>It is the time when they grow fastest and, therefore, their nutrient requirements are greatest.</i> <i>They need to eat adequately (quality and quantity) to be able to grow well and prepare for when they are ready to have children.</i> <i>Therefore, adolescent girls need enough iron-rich foods (e.g. red meat, beans and dark-green leafy vegetables) and other vegetables and fruits to protect them from getting anaemia.</i> <i>7. They also need to avoid getting pregnant until they are 20 years and above. Avoid early marriage.</i> <i>8. Girls and women (whether pregnant or lactating) need to eat more energy foods, a lot of iron rich-foods to stay active and healthy, to produce healthy babies and breastfeed well.</i> <i>Women also need a lot of iron-rich foods because of menstruation.</i>	<i>Women's diets are important for their health and reproductive health outcomes.</i>

		<i>9. Well-nourished women are likely to have healthy pregnancies, healthy babies and healthy bodies to take care of their children and the community.</i> <i>10. During pregnancy and lactation, a woman's need for energy and other nutrients increases and, therefore, she needs to eat more frequently.</i> <i>11. A poorly- nourished woman may develop complications and experience difficult labour that threatens her life.</i> <i>12. A poorly-nourished woman may also give birth to very small babies- who grow and develop very slowly and stand a greater risk of infection.</i> <i>13. Men need healthy diets to keep strong and productive. Men should consume enough energy-giving foods- to meet their need for health and physical activity. Men also need to eat from a wide variety of food groups to maintain healthy nutritional status and health.</i> <i>14. Iron-rich foods are helpful for reducing risk of anaemia.</i>	
3. Some community beliefs and practices contributing to women's poor dietary practices	Positive attitudes to food taboos and restrictions against women was high, preferential food allocation practices where women are served food last and get bony parts of meat shared at meals	<i>15. Let's not discourage some community members especially women and children from consuming certain foods in the community. Women (whether pregnant or lactating) as well as men and other community members should be able to consume any food.</i> <i>16. All foods produced in community can be nutritious depending on how we combine them to eat. Pregnant and lactating women as well as adolescent girls should consume enough vegetables, fruits, legumes and fish.</i> <i>17. Family foods need to be shared according to individual needs.</i>	<i>Address unfounded beliefs and taboos and discriminatory practices to help improve women's diets</i>

		<i>Women and children have the greatest energy requirements and this must be considered when sharing food at the household level.</i> <i>18. Rest during daytime for women helps to conserve some of their energy to improve their health.</i> <i>Men and other household members can help women with household chores to allow women to have some rest during the day.</i>	
4. Lack of sufficient power and control over household food resources by women.	Women had no rights to farmland. Women depended on husbands for small parcels of farmland to grow household food needs. Woman had no direct access to grains. Women had no regular income-generating activities to enable them to acquire other food resources for the home.	<i>19. Allowing women to have as much access to farmland as men will improve quantities and varieties of foods produced.</i> <i>20. As the main people who prepare and feed families, allowing women more access to food resources will contribute to improving the qualities and quantities of household food needs.</i> <i>21. Women need to be economically supported to be able to contribute to food for the family/household.</i> <i>22. Income generating activities like trading, small-scale farming and food processing do not need a lot of start-up capital but can serve as sources of income for women to contribute to household food needs.</i>	<i>Empower women to have control over resources so they can improve their dietary quality.</i>
5. Poor food	Most households stored their farm produce in	<i>23. Food-processing methods like drying can prolong shelf-lives and improve availability of nutrient-rich vegetables and fruits.</i>	<i>Improving food preservation and</i>

preservation and preparation methods	unprotected sacks and kept them on the bare floors in their rooms. Inadequate drying of farm produce resulting in aflatoxin infestation Little use of fermentation as a preservation method and over-cooking of vegetables	<i>Most vegetables we consume can be preserved by drying so they be kept throughout the year. Some of these are being done already. Can we do similarly for others such as alefu, ayoyo, cassava leaf and bean leaf?</i> <i>24. Fermentation gives foods longer shelf-lives and also improves the digestion and absorption of iron and other nutrients from such foods.</i> <i>25. Cooking vegetables for an extended duration destroys some of the important nutrients they contain.</i> <i>Therefore, leafy vegetables should be cooked for very short durations.</i> <i>26. Consuming well-handled and clean fruits and vegetables in their raw states is one way of ensuring we get, as much as possible, all their nutrients to nourish our bodies.</i>	<i>preparation enhances the nutrient qualities of diets.</i>
6. Poor environmental hygiene/sanitation	Most compounds in the community were observed to be unkempt even during food preparation. Animal droppings and other debris were found all over homes and surroundings.	<i>27. Good environmental hygiene and sanitation enhance the health of all. Constantly keeping our compounds and community clean contributes to good health.</i> <i>28. Keeping our drains and gutters clean will prevent the breeding of mosquitoes, which causes malaria.</i> <i>Keeping our environment clean prevents the outbreak of diseases such as cholera.</i>	<i>Let's keep our environment clean to avoid contracting diseases.</i>

Appendix O: Cooking demonstration sessions

A. Processing of soya bean flour.

Ingredients:

Whole dried soya bean and water

Method

1. Clean soya thoroughly by removing all debris such as stones, chaff, dirt and other foreign materials.
2. Wash in clean water.
3. Boil for 30 minutes in an open pot.
4. Drain and wash in cold water while rubbing between the palms to hull.
5. Dry hulled beans thoroughly.
6. Mill to flour.
7. Store in air-tight container and use within one month.

B. Soya and “alefu” stew with boiled yam and rice

Ingredients

Soya beans, oil, pepper, tomatoes, saly, pounded anchovies, onion, water and “alefu” leaves

Method:

1. Heat oil (shea butter) on fire.
2. Fry onion in oil for a while.
3. Add ground tomato and pepper and stir till almost cooked.
4. Add pounded anchovies.
5. Mix some amount of soya flour with water into a paste and add into boiling stew and stir.
6. Add chopped and “alefu” to the stew, stir and allow to cook for 5 minutes.
7. Add a little salt to taste.
8. Serve with boiled yam and rice.

C. Weanimix porridge with soya flour

Ingredients

Maize, groundnuts, soya flour salt, sugar

Method

1. Take 4 parts of maize to 1 part of soya bean and half part of groundnuts.
2. Roast groundnuts, hulled soya bean and maize separately.
3. Put all three ingredients together, allow to cool and add spices if desired.
4. Mill content into fine flour.
5. Put water on fire with a little salt until boiling point.
6. Mix flour into a liquid texture and to boiling water.
7. Stir thoroughly to avoid lumps.
8. Allow to boil for 5 to 10 minutes depending on the intensity of fire.
9. Serve with a little sugar .

E. Bra soup with soya flour

Ingredients

Groundnut paste, soya flour, pepper, tomato, onion, bra leaves, anchovies, water, dawadawa, salt

Method

1. Mix groundnut paste with water and cook for a while.
2. Add water to make mixture lighter.
3. Add onion, tomato and pepper to mixture and boil till tomato, onion and pepper are cooked.
4. Remove and mash the tomato, pepper, onion and return to boiling mixture.
5. Add anchovies, dawadawa and soya flour to boil till cooked.
6. Add chopped bra to soup and allow to boil for 5 minutes.
7. Add salt to taste.

F. Ayoyo soup with soya

Ingredients

Ayoyo leaves, soya flour, shea butter oil, tomato, onion, pepper, dawadawa, salt, pounded anchovies

Method

1. Heat shea butter in a pot.
2. Add onion and fry till golden brown.
3. Add ground or mashed tomatoes and pepper to heated butter with onion.
4. Add dawadawa.
5. Allow to cook for a while.
6. Add water to boiling ingredients to desired quantity and allow to boil.
7. Add a generous quantity of soya flour to boiling soup.
8. Chop ayoyo leaves and boil for about 5 minutes.
9. Add boiled ayoyo to boiling soup and allow to boil for a minute or two.
10. Add salt to taste and serve with TZ.

G. TZ fortified with soya flour

Ingredients

Fermented maize flour, soya flour, water, cassava flour (optional)

Method

1. Put a pot of water on fire till boiling point.
2. Mix maize flour with water into a porridge-like consistency.
3. Add to boiling water amidst stirring to avoid lumps.
4. Allow to boil for a few minutes.
5. Mix maize, soya and cassava flour together.
6. Add mixture of flour to boiling TZ porridge amidst stirring until a thick –like texture is achieved. Continue to stir thick –like TZ until cooked.
7. Serve with any soup especially ayoyo and bra soup.

H. Soya bean Tubani

Ingredients

Four parts of cowpea flour, one part of soya flour, water, salt, onion, roasted and pounded sesame seeds, salt-petre, shea butter oil, dry yam leaves, transparent rubber bags for wrapping and steaming

Method

1. Mix cowpea and soya flour together.
2. Add water to content and stir until fluffy and add salt to taste.
3. Mix content until a butter like substance is achieved.
4. Add a little salt petre to mixture.
5. Fetch desired quantities of mixture and wrap into leaves for steaming.

**Appendix P: Certificate of ethical clearance from Noguchi Memorial Institute for
Medical Research**

NOGUCHI MEMORIAL INSTITUTE FOR MEDICAL RESEARCH
Established 1979 *A Constituent of the College of Health Sciences*
University of Ghana

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My Ref. No: DF.22
Your Ref. No:

INSTITUTIONAL REVIEW BOARD

Post Office Box LG 581
Legon, Accra
Ghana

2nd March, 2016

ETHICAL CLEARANCE

FEDERALWIDE ASSURANCE FWA 00001824 **IRB 00001276**

NMIMR-IRB CPN 077/15-16 **IORG 0000908**

On 2nd March 2016, the Noguchi Memorial Institute for Medical Research (NMIMR) Institutional Review Board (IRB) at a full board meeting reviewed and approved your protocol titled:

TITLE OF PROTOCOL : **A formative study of community perceptions and strategies to improve women's dietary quality in the Savelgu-Nanton District, Ghana**

PRINCIPAL INVESTIGATOR : **Sawudatu Zakariah, PhD Cand.**

Please note that a final review report must be submitted to the Board at the completion of the study. Your research records may be audited at any time during or after the implementation.

Any modification of this research project must be submitted to the IRB for review and approval prior to implementation.

Please report all serious adverse events related to this study to NMIMR-IRB within seven days verbally and fourteen days in writing.

This certificate is valid till 1st March, 2017. You are to submit annual reports for continuing review.

Signature of Chair:
Mrs. Chris Dadzie
(NMIMR – IRB, Chair)

**Appendix Q: Certificate of ethical clearance from Noguchi Memorial Institute for
Medical Research (Renewed)**

NOGUCHI MEMORIAL INSTITUTE FOR MEDICAL RESEARCH
Established 1979
A Constituent of the College of Health Sciences
University of Ghana

INSTITUTIONAL REVIEW BOARD



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Post Office Box LG 581
Legon, Accra
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My Ref. No: DF.22
Your Ref. No:

8th March, 2017

ETHICAL CLEARANCE

FEDERALWIDE ASSURANCE FWA 00001824

IRB 00001276

NMIMR-IRB CPN 077/15-16 revd. 2017

IORG 0000908

On 8th March, 2017, the Noguchi Memorial Institute for Medical Research (NMIMR) Institutional Review Board (IRB) at a full board meeting conducted continuing review and renewed your protocol titled:

TITLE OF PROTOCOL : A formative study of community perceptions and strategies to improve women's dietary quality in the Savelgu-Nanton District, Ghana

PRINCIPAL INVESTIGATOR : Sawudatu Zakariah PhD Cand.

Please note that a final review report must be submitted to the Board at the completion of the study. Your research records may be audited at any time during or after the implementation.

Any modification of this research project must be submitted to the IRB for review and approval prior to implementation.

Please report all serious adverse events related to this study to NMIMR-IRB within seven days verbally and fourteen days in writing.

This certificate is valid till 7th March, 2018. You are to submit annual reports for continuing review.

Signature of Chair:
Mrs. Chris Dadzie
(NMIMR – IRB, Chair)