

CHAPTER ONE

INTRODUCTION

Background To The Study

Over the years, the idea of community has changed into accommodating new inventories. Various authorities have defined community from different views yet their ideas pinned to the same idea. That is, people living together to share the same value. The term community as opined by Barzilai (2003), means a group of interacting people, living in some proximity (in space, time, or relationship). Community usually refers to a social unit larger than a household that shares common values and has social cohesion. The term, as posited by Bearreena (2001), means where people gather around a common area for their mutual benefit, sharing a language, customs, ideas, skills, goods and services.

A community implies a community spirit where a sense of belonging and common identity draw people together. The nature and structure of communities may vary greatly but certain functions are virtually universally present irrespective of culture, climate and other factors. The Center for Disease Control and Prevention (2004) posited that communal living provides alternatives, and can help to remedy the isolation and lack of work/life balance so endemic in our society, particularly for rural women. Bearreena (2001), noted that a well planned community offers a variety of choices including learning opportunities of different types. Therefore, nutrition education can effectively be carried out in a community to help members provide some of their needs.

Community based nutrition education programmes according to McGuire, and Popkin (2004), are strategies designed to reach members of the community in order to improve their health knowledge and attitudes towards nutrition. It can also be used to encourage and enhance the health and wellness of the members of the community. Therefore, it could be

used to improve the nutritional health knowledge and attitudes of the rural women and to eliminate or reduce factors that contribute to the nutritional problems. It may also emphasize the importance of active community participation in making decisions and finding solutions to nutritional problems.

Nutrition is the study of food and how the body makes use of it. Ewuzie (2004) described it as the study of the composition of food and the utilization of this food by the body. According to Ewuzie, it is not only concerned with the quality and quantity of the food one eats but the processes by which one receives and utilizes the food in the body for growth and renewal as well as for the maintenance of different body functions. Personal experience has shown that nutrition determines the size of an individual and, along with hereditary factors, affects stamina and ability to resist diseases and infections. It also affects the life expectancy or length of life. Nutrition education can, therefore, be used to improve people's knowledge of different food substances and their attitudes towards them.

Banisaiye (2000), defined education as a cumulative process of development of intellectual abilities, skills and attitudes, all of which generally form people's outlooks and dispositions to action in life. Education improves both the mind and body, social outlook, as well as physical and intellectual capacities. More recent experiences, by Craven (2002), in contrast with the conventional approach, show that nutrition education is concerned not only with imparting knowledge, but also with finding ways to work with individuals or groups in the community in a systematic manner that will stimulate their participation in, and commitment to the learning process (National Institute of Nutrition, 2003). Nutrition education undertaken in this spirit is interactive. It encourages any exchange of information between the educator and the community. This also empowers people to make appropriate choices using both scientific and local knowledge. Moreover, personal experience has shown

that nutrition education leads to the adoption of improved behaviour and contributes to lasting effects and changes.

According to Agbonjinmi and Cole (2005), one of the principal aims of nutrition education is to provide people with adequate information, skills and motivation to procure and consume appropriate foods. Community-based nutrition education programme can focus on strategies to improve family food supplies and efficient resources to provide well balanced diets and better care for vulnerable groups.

According to Aston (2006), nutrition education programme should have at least three components, namely: (1) increasing nutrition knowledge and awareness of the public and policymakers; (2) promoting desirable healthy food choices and nutritional practices and (3) increasing diversity and quality of family food supplies. These components should aim at improving the knowledge and attitudes of recipients. According to Craven (2002), knowledge is a familiarity with someone or something, which can include facts, information, descriptions or skills acquired through experience or education. For Gottschalk-Mazouz (2008), knowledge can refer to the theoretical or practical understanding of a subject. Adequate knowledge of nutrition among rural women will help them not only to provide adequately for their families but also to appreciate the fact that with nutrition one can live a well balanced life and can prevent most of the health problems that are common among people in society. It follows therefore that participation in nutrition education can bring about appropriate changes in the health of individuals concerned. The study carried out by Lytle and Achterberg (2001) revealed that nutrition education is a significant demographic factor that influenced knowledge and attitude. Similarly studies by Addo, Akeredolu and Akeredolu (2000), Shilangu (2006) and Nyakwuru (2009) suggested that nutrition education is a key factor that has been shown to influence knowledge and attitude of people in Africa.

Attitude on the other hand, is defined by Eagly and Chaiken, (2005) as a hypothetical construct that represents an individual's degree of like or dislike for an item. Attitudes are generally positive or negative views of a person, place, thing, or event. Attitudes can be regarded as judgments and they develop on the ABC model (affective, behaviour, and cognition). Eagly and Chaiken (2005) in explaining this model, opined that the *affective* response is an emotional response that expresses an individual's degree of preference for an entity and that the *behavioural* response is a verbal indication or typical behavioural tendency of an individual. They also opined that while the *cognitive* response is a cognitive evaluation of the entity that constitutes an individual's belief about the object. Nutritional attitudes according to Baltas (2010) are those attitudes that affect a person's nutritional choice. According to Wagner (2011), only with the desire to be healthy combined with the proper nutritional knowledge and tools will an individual achieve total body wellness. Knowledge and attitude will constitute the two dependent variables in the present study.

The current realization that knowledge and attitude influence nutrition education has led to the use of various educational strategies aimed at increasing people's health knowledge and to help them develop positive attitudes towards nutrition. Promoting nutrition education on radio or television can be an important means of raising awareness and improving nutritional knowledge. Nutritional knowledge and attitude of rural women in different communities in Idemili South LGA can promote or inhibit their nutritional actions and activities that promote health. Rural women are women who live in villages or areas that are not developed. Lytle (2010) opined that rural women live communal life, fetch water from common stream, lack amenities like electricity, access roads, pipe borne water among others. Some of the rural women in Idemili South LGA are not formally educated. Hence they may be lacking some adequate knowledge of basic nutritional issues and this attitude is not encouraging. In this study, it is hoped that the recipients of the intended community based

nutrition education programme would gain adequate nutritional knowledge and improved attitudes towards nutrition which would help them provide adequately for their respective families.

Apart from knowledge and attitude, there are other moderator variables such as age level of education and occupation that have been shown to equally influence nutritional knowledge and attitudes. Moderator variables are the factors which are measured, manipulated, or selected by the experimenter to discover whether they modify the relationship of the variables to an observed phenomenon (Muller, Judd & Yzerbyt, 2005).

For example with respect to age, studies have shown that knowledge of nutrition differed remarkably by age. Siegel and Fawcett (2005) observed that women aged 30-35 years seem to have a higher level of knowledge of nutrition than those aged 24-29 years. Equally women of 42 years and above showed more positive attitudes towards nutrition than the younger ones. Another variable which influences nutritional knowledge and attitude is the level of education. Female education has been seen as a key determinant of nutritional knowledge and attitude (National Population Commission, 2004). Better educated women seem to be more willing to engage in innovative behaviour than the less educated women. Better educated women also seem to be more willing to have more knowledge of nutrition than less educated women because of their literacy, greater familiarity with modern institutions, and a greater likelihood of rejection of fatalistic attitudes towards life. There is good evidence that for whatever reason women's education indeed promotes knowledge and attitudes of nutrition in most communities (Gillespie & Mason, 2003).

Women's occupation such as farming, civil servant, trading, and being a housewife among others can affect their nutritional knowledge and attitudes. Findings from Ihediohanma (2010) on nutrition education programmes have indicated that occupation plays an important part in women's involvement in nutrition education programmes (World Health

Organization, 2005). According to WHO, employment and working conditions greatly affect health and involvement of women in health activities. This is because daily activities of women affect their interest in nutrition programme. Women need to empower themselves economically to meet their family obligations thus reducing vulnerability and poverty among members of their households.

It is against the background of healthy nutrition that this study was designed to determine the effects of community-based nutrition education programme on nutritional knowledge and attitudes of rural women in Idemili South Local Government Area of Anambra State, with a view to helping these women and their families live healthfully.

Statement of the Problem

Women living in rural areas of Nigeria are generally known to be suffering from general deprivation including access to information resources and lack of education (Boroffice, 2009; Mishra, & Retherford, 2009). Personal experience has shown that rural women most often fail to access various information resources and services even when such information and service are available. The reasons may among other factors be related to the socio-economic status of the rural women or the format in which such information programmes are packaged. In Nigeria, the Government had introduced some economic and health intervention programmes such as Green Revolution, Poverty Alleviation, Health For All and so many others which the rural women could benefit from (FGN, 2004). Even with all these intervention programmes, personal experience has shown that most Nigerians, especially rural women lack adequate nutritional knowledge and do not have adequate positive attitudes toward nutrition. This results in nutritional problems such as malnutrition, poor dietary practices, increased risk of chronic and oral diseases, craniofacial birth defects and negative reproductive success.

A recent FAO/WHO study (2007) in Africa noted that women very rarely participate courses on nutrition education programmes. Two notable constraints on women's participation in such programmes that can be addressed are the duration and location of the training (Dei, 2009). It is pertinent to point out that most Nigerian researchers on nutrition education programme have focused exclusively on nutrition education methods, and determination of needs for nutrition education programme (Ene-Ebong, 2004; McCormick-Brawn 1999; Biswas 2002; Krause & Hunscher, 2002). Scarcely do researcher have studies on the effects of education or of various education methods influencing health knowledge and attitudes with respect to nutrition among any group of persons in Nigeria and Anambra State in particular. A more appropriate method of getting the rural women in Anambra State to have adequate knowledge of nutrition and develop more positive attitudes toward the subject is therefore needed. Therefore that this study is designed to ascertain the effects of community-based nutrition education programmes on nutritional knowledge and attitudes of rural women in Idemili South L.G.A of Anambra State, and the influence of selected demographic variables.

Purpose of the Study

The purpose of this study was to determine the effect of community-based nutrition education programme on the nutritional knowledge and attitude of rural women in Idemili South LGA of Anambra State specially the study aimed at determining the effect of nutrition education on the:

1. Knowledge scores of rural women in Idemili South LGA after nutrition education.
2. Nutritional knowledge scores of rural women of different age groups in Idemili South Local Government Area of Anambra State after nutrition education.

3. Nutritional knowledge scores of rural women with different levels of education in Idemili South Local Government Area of Anambra State after nutrition education
4. Nutritional knowledge scores of rural women of different occupations in Idemili South Local Government Area of Anambra State after nutrition education.
5. Nutritional attitude scores of rural women in Idemili South Local Government Area after nutrition education.
6. Nutritional attitude scores of rural women of different age groups in Idemili South Local Government Area after nutrition education.
7. Nutritional attitude scores of rural women of different levels of education in Idemili South Local Government Area of Anambra State after nutrition education
8. Nutrition attitude score of rural women of different occupation in Idemili South Local Government Area of Anambra State after nutrition education.

Significance of the Study

The result of this study would create awareness, increase knowledge and bring positive attitudinal change towards nutrition in rural women, organizers and sponsors of nutrition education programmes, future researchers, health education teachers, medical, paramedical, government and non-governmental organizations, students and health educators as well as women leaders.

The findings of this study would not only draw out base line data on rural women but also bring out information regarding their nutritional knowledge and attitudes that would enable health policy makers to be better equipped with appropriate information needed to spread sound polices and relevant programmes for this segment of the population. It is also expected that the findings of the study would enable organizers and sponsors of nutrition education programmes know whether teaching, especially in

rural setting, is an appropriate and better strategy to be adopted in improving the acceptance rate of nutrition education, and thereby invest relevant resources accordingly. The findings would also provide guidance towards the development, review and functional implementation of community-based health education programme for improving the nutritional knowledge and attitudes of rural women in Idemili South Local Government Area of, Anambra State. The results of the study are expected to assist future researchers to explore further areas of nutrition education, and may help those who may want to replicate the work elsewhere and make further contributions to knowledge in this area.

Health education teachers would benefit from the study if they utilize the results in both classroom instruction and nutrition counseling of the rural women and they would adequately be equipped to guide women towards healthy nutrition lifestyles that will make them attain the normal weight for their age.

The findings of this study would be useful to medical, paramedical, government as well as nongovernmental organizations that have interest in nutrition programme for rural women. They would utilize the findings of the study as a guide in developing appropriate methods and approaches in teaching and handling nutritional problems.

The result would also benefit students who are researching on such issues as nutrition education programmes in connection with rural women and also improve their knowledge on ways to improve on good nutrition knowledge in general.

Finally, results of the study would sensitize health educators and women leaders in ensuring that rural women acquire the needed health knowledge and positive attitude about nutrition through in-house seminars and workshops as well as health talks.

Scope of the Study

The subject of this study is the effects of community-based education programme on nutritional knowledge and attitude of rural women in Idemili South L.G.A of Anambra State. The researcher has decided to concentrate on this class of women because they appear to be the group that urgently needs such a programme.

The study would be delimited to dependent variables of nutrition knowledge and attitudes; and also would be delimited to independent variables of age, levels of education and occupation of these rural women. It would further be delimited to rural women who are members of social clubs in each of the three out of seven existing towns that make up Idemili South Local Government Area in Anambra State.

Research questions

The following were the research questions that guided the study:

1. What is the effect of nutrition education on the nutritional knowledge of rural women in Idemili South Local Government Area of Anambra State?
2. What is the effect of nutrition education on the nutritional knowledge scores of rural women of different age groups in Idemili South Local Government Area of Anambra State after nutrition education?
3. What is the effect of nutrition education on the nutritional knowledge scores of rural women of different levels of education in Idemili South Local Government Area of Anambra State after nutrition education.
4. What is the effect of nutrition education on the nutritional knowledge scores of rural women of different occupations in Idemili South Local Government Area of Anambra State after nutrition education?

5. What is the effect of nutrition education on the nutritional attitude scores of rural women in Idemili South Local Government Area of Anambra State after nutrition education?
6. What is the effect of nutrition education on the nutritional attitude scores of rural women of different age group in Idemili South Local Government Area of Anambra State after nutrition education?
7. What is the effect of nutrition education on the nutritional attitude scores of rural women of different levels of education in Idemili South Local Government Area of Anambra State after nutrition education?
8. What is the effect of nutrition education on the nutritional attitude scores of rural women of different occupations in Idemili South Local Government Area of Anambra State after nutrition education.

Hypotheses

Specifically the following null hypotheses guided the study and were tested at 0.05 levels of significance.

1. There is no significant difference in the mean nutritional knowledge scores of rural women in idemili South Local Government Area of Anambra State before and after nutrition education
2. There is no significant difference in the mean different of nutritional knowledge scores of rural women of different age groups in Idemili South Local Government of Anambra State after nutrition education.
3. There is no significant difference in the mean different of nutritional knowledge scores of rural women of different levels of education in Idemili South Local Government Area of Anambra State after nutrition education.

4. There is no significant difference in the mean of different nutritional knowledge scores of rural women of different occupations in Idemili South Local Government of Anambra State after nutrition education.
5. There is no significant different in the mean nutritional attitude scores of rural women in Idemili South Local Government Area of Anambra State before and after nutrition education.
6. There is no significant difference in the mean of different attitude scores of rural women of different age groups in Idemili South Local Government Area of Anambra State after nutrition education.
7. There is no significant difference in the mean of different attitude scores of rural women with different levels of education in Idemili South Local Government Area of Anambra State after nutrition education.
8. There is no significant difference in the mean of different attitude scores of rural women of different occupations in Idemili South Local Government Area of Anambra State after nutrition education.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The related literature was reviewed under the following headings:

Conceptual Framework

Community

Nutrition and Nutrition Education

Knowledge and Nutritional Knowledge

Attitude and Nutritional Attitude

Rural Women

Theoretical Framework

Health Belief Model (HBM)

Theoretical Studies

The importance of Community based education programmes

Factors that influence nutrition education

Relationship between knowledge and Attitude

A framework for planning nutrition education programmes

Related Empirical Studies

Nutrition knowledge, attitude and practices

Effects of nutrition education knowledge and attitudes of mothers

Summary of Reviewed Literature

Conceptual Framework

Community

According to Kurtz and Johnson-Welch (2004), community is a social, religious, occupational, or other group sharing common characteristics or interests and perceived or perceiving itself as distinct in some respect from the larger society within which it exists.

The term community as opined by Barzilai (2003) means a group of interacting people, living in some proximity (examples, in space, time, or relationship). Community usually refers to a social unit larger than a household that shares common values and has social cohesion. The term, as posited by Bearreena (2001), can also refer to the national community or international community.

Ihediohanma (2010) opined that most people think of communities as a place or setting, or a suburb or city that they live in. According to Ihediohanma, communities are much more than that. Communities are the building blocks that allow people to make sense of the world, in which they live, participate and share experiences. They provide a sense of identity and purpose, a sense of being a part of and belonging.

The idea of community according to Bearreena (2001) probably came about where people gathered around a common area for their mutual benefit. Sharing a language, customs, ideas, skills, goods and services, or protection from enemies would be some of the advantages in being a part of a group. Over the years the idea of community has changed to accommodate different things. While different definitions mean different things, the idea is the same: that a group comes together or lives together to share something that is of value to the members of that community (Onis, 2004).

Traditionally, a community has been defined as a group of interacting people living in a common location. According to Reynolds, Hinton and Shewchuk (2008), the word is often used to refer to a group that is organized around common values and is attributed with social

cohesion within a shared geographical location, generally in social units larger than a household. The word can also refer to the national community or global community. In this study, community refers to the people who are subjected to our nutrition education programme.

Nutrition and nutritional education

Nutrition is the study of food and how the body makes use of it. Ewuzie (2004) described nutrition as the study of composition of food and the utilization of this food by the body. It is not only concerned with the quality and quantity of the food one eats but the processes by which one receives and utilizes the food in the body for growth and renewal as well as for maintenance of the different body functions (Ngwu, 2002). Ngwu maintained that the basic function of nutrition is to provide life and to sustain that life by allowing it to grow and be in a state of optimal health. Specifically, the food one eats allows for growth in height and weight; provides heat and energy for work and play and keeps the body systems (examples digestive, respiratory, circulatory etc) in good functional condition.

According to Hornby (2000) nutrition is the process by which living things receive the food necessary for them to grow and be healthy. Good nutrition as opined by Ewuzie (2004) is important in developing a sound mind and a sound body. Not many people realize the importance of good nutrition. Good nutrition as opined by Medical News (2012) means taking in the right kind of nutrients in the right amount needed by the body. Good nutrition makes happy and healthy family members. When every family member is properly fed, each member feels and looks good. Each person is active, has a pleasant disposition, and can relate with each other.

According to Hornik (2003), nutrition education is any combination of educational strategies, accompanied by environmental supports designed to facilitate voluntary adoption

of food choices and other food and nutrition-related behaviours conducive to health and well-being. Nutrition education is delivered through multiple venues and involves activities at the individual community and policy levels.

Maynard (2000) opined that nutrition education means developing a public consciousness of the importance of good nutrition and sound food policies for the promotion of national vigour and stability. According to Bressani (2004) and Oseni (2001), nutrition education as a means of translating nutritional requirements into food and adjusting food choices to satisfy physiological, cultural, psychological and economic needs.

Nutrition education as defined by Bankley (2006) is a programme to promote better health by providing accurate and culturally sensitive nutrition, physical fitness or health (as it relates to nutrition) information and instruction to participants, caregivers or participants and caregivers in a group or individual setting overseen by a dietician or individual of comparable expertise. Also, Berg, (2004) maintained that nutrition education is thus no longer just imparting information, or bombarding people with nutrition messages, but getting people - everyone from target villagers to national policy makers - to do something differently in order to improve nutrition.

Knowledge and nutritional knowledge

Knowledge according to Craven (2002) is a familiarity with someone or something, which can include facts, information, descriptions or skills acquired through experience or education. It can refer to the theoretical or practical understanding of a subject. It can be implicit (as with practical skill or expertise) or explicit (as with the theoretical understanding of a subject). It can be more or less formal or systematic. In philosophy, the study of knowledge is called epistemology; the philosopher Plato famously defined knowledge as “justified true belief”. However, according to Lytle (2012), no single agreed upon definition

of knowledge exists, though there are numerous theories to explain it. The question how knowledge should be defined is perhaps the most important and difficult. This may seem surprising; at first sight it might be thought that knowledge might be defined as belief which is in agreement with the facts. But Cavell argued that no one knows what a belief is, no one knows what a fact is, and no one knows what sort of agreement between them would make a belief true.

In reviewing the sources of knowledge, Gottschalk-Mazouz, (2008) submitted that everything we know originates from four basic sources, firstly from senses which are the most important, secondly authority, that is knowing from other sources, hopefully, experts, thirdly reason and fourthly intuition. Ene Obong, (2011) defined information from the senses as empirical knowledge and Gottschalk-Mazouz (2008) believe that the fundamental source of all knowledge is our sense. Our senses are exploratory organs, we use them to become acquainted with the world we live in. we learn that sugar is sweet, lemons are not and Onions are not. The sun is bright and blinding. Glowing coals in the fire place are beautiful if you do not touch them. Sounds soothe, warm, or frighten us. Through millions of single sense-events we build a fabric of empirical information which help us interpret, survive in, and control the world about us. For this study therefore knowledge will be used as a tool which can help the rural women through adequate education improve their nutritional knowledge and attitudes.

Nutritional knowledge is that knowledge that an individual should possess for him to know those processes involved in the taking in and the utilization of food substances by which growth, repair and maintenance of the body are accomplished. According to Wilson (2009), nutrition knowledge is a prerequisite for processing nutrition-related information when making food choices. Sharp (2002) argued that nutritional knowledge is necessary but not sufficient factor for changes in consumers' food behaviours. They are influenced by a number of environmental and intra-individual factors, including motivations.

Attitude and nutritional attitude

Attitude is an expression of favour or disfavour towards a person, place, thing or event (the attitude objective). Buttriss (2010) defined attitude as a positive or negative evaluation of people, objects, event , activities, ideas or just about anything in ones environment. Attitude as a concept does not really settle for one definition as debates are still on as to what to use in defining attitude as a concept. For instance, Eagly and Chaiken (1998) defined an attitude as “a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour. Woodruff (2000) defined attitude as one habitual way of looking at the word around him. Woodruff further stressed that attitude develop through conditioning. Conditioning begins at a very early age and continues throughout ones life.

Attitude can be expressed in different ways. Woodruff (2000) posited that expression of attitude can be observed in three ways: positive, negative and conflicted/ambivalent attitude. Positive attitude is the readiness to accept the conditions towards an action. Negative attitude is the disposition of disfavour towards an event, object or person, as ambivalent/conflicted attitude refer to the situation whereby an individual expresses both positive and negative attitude at the same time toward the same object, person or event. Hence this has led to some discussion of whether individual can hold multiple attitudes towards the same object. This study was concerned with the determination of the effects of nutrition on the negative attitudes of rural women, and helping them to develop positive attitude towards nutrition for healthful living.

Since attitudes are learned, they can be taught because they are enduring enough to be stable, but are temporary enough to be transformed. In this study attempts will be made to transform the negative nutritional attitude of the subjects through adequately planned nutrition education programme.

Nutritional attitudes according to Baltas, (2010) are those attitudes that affect a person's nutritional choice. According to Wagner (2011), only with the desire to be healthy combined with the proper nutritional knowledge and tools, will an individual achieve total body wellness. With the right mindset, a human begin can accomplish anything. While consumers do agree that nutrition is important, there are significant differences between the ways in which the various audiences approach the subject.

Sun, Sangwen, Chen, and Cheungs (2003) submitted that, one of the ways that a negative attitude can prevail during dieting is if you have set goals for yourself. Subjects of this study will be encouraged to set for themselves reasonable nutritional goals. It is only by so doing that the programme of this study will have positive effect on their attitude towards nutrition.

Rural Women

Literarily, a rural woman is a female of child bearing age living in an underdeveloped area (example village). According to Bryceson and Howe (2009), rural women can be defined as woman living or residing in villages and they are characterized by their low level of literacy and their engagement with certain activities such as farming, fishing, trading, weaving and so on.

Rural women live together and do things in common such as fetching water from stream, fetch firewood and go to farm, (Aykroyd & Mayer 2005). Rural women play key roles in supporting their households and communities in achieving food and nutrition security, generating income, and improving rural livelihoods and overall being. They contribute to agriculture and rural enterprises and fuel local and global economics. According to Prayer, Rogers and Rahman (2003) rural women spend more time than urban women and men in reproductive and household work, including time spent obtaining water, fuel, caring for children and the sick and processing food. This is because of poor rural infrastructure and

services as well as culturally assigned roles that severely limit women's participation in employment opportunities. Rural women face persistent structural constraints that prevent them from fully enjoying their human rights and hamper their efforts to improve their lives as well as those of others around them. Because of the important roles rural women play in feeding and caring for their families they need adequate knowledge of nutrition. Therefore, their use for this study is very appropriate.

Theoretical framework

The theory Health Belief Model (HBM) provides examples on how the behaviour change process is believed to occur.

Health Belief Model (HBM)

According to Janz and Becker (2000), the health belief model (HBM) was one of the first, and remains one of the best known social cognition models. It is a health behaviour change and psychological model developed by Irwin M. Rosenstock in 1966 for studying and promoting the uptake of health services. The model was furthered by Becker and colleagues in the 1970s and 1980s. Subsequent amendments to the model were made as late as 1988, to accommodate evolving evidence generated within the health community about the role that knowledge and perceptions play in personal responsibility (Glanz , Lewis & Rimer, 2002).

Originally, the model was designed to predict behavioural response to the treatment received by acutely or chronically ill patients, but in more recent years the model has been used to predict more general health behaviours Rosenstock, Strecher and Becker, (1988) posited that the HBM suggests that one's belief in a personal threat together with one's belief in the effectiveness of the proposed behaviour will predict the likelihood of that behaviour.

The Health Belief Model

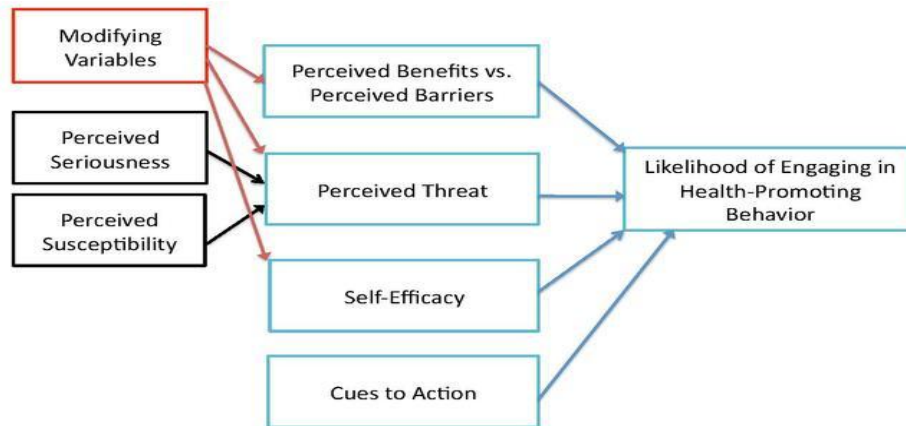


Figure 3: Health Belief model

Source: Glanz, Lewis and Rimer (1997)

The Health Belief Model has been applied to a broad range of health behaviours and subject populations. Four broad areas can be identified (Cobb, & Kasi (2006); Preventive health behaviours, which include health-promoting (example diet, exercise) and health-risk behaviours (example smoking).

Esiet, Phillipher and Phillipher (1999) posited that the HBM derives from psychological and behavioural theory with the foundation that the two components of health-related behaviour are (the desire to avoid illness, or conversely get well if already ill; and, 2) the belief that a specific health action will prevent, or cure, illness. In this study, community based nutrition education programme will be used to help the rural women avoid diseases, especially deficiency diseases and also take care of the deficiency diseases that may occur among them. Ultimately, according to Esiet, et al, an individual's course of action often depends on the person's perceptions of the benefits and barriers related to health behaviour. There are six constructs of the HBM. (Becker, 1999; Cockerham 2001; Rosenstock 1974). The first four constructs were developed as the original tenets of the HBM. The last two were added as research on HBM evolved.

Perceived susceptibility - This refers to a person's subjective perception of the risk of acquiring an illness or disease. (Rosenstock, Stretcher & Becker, 1994) There is a wide variation in a person's feelings of personal vulnerability to an illness or disease. In this study, for adequate nutritional attitude of the subjects to develop, efforts should be made to help them not to underestimate their own susceptibility to any nutritional disease condition, but to see themselves in the level of high susceptibility. If this happens the subjects will be in a position to avoid some nutritional disease conditions.

Perceived severity - This refers to a person's feelings on the seriousness of contracting an illness or disease (or leaving the illness or disease untreated). There is wide variation in a person's feelings of severity, and often a person considers the medical consequences (example, death, disability) and social consequences (example family life, social relationships) when evaluating the severity. In health education, the individual's perception of the seriousness of the threat is an important motivator for a positive healthy decision and pattern of healthy behaviour. At this point, the threatened person is most likely to experience a desire to protect himself against the threat. But in order to do anything about it, he must perceive some actions that he believes will provide him with such protection and that he sees it as one that he is able to take. Rural women should be encouraged to see the seriousness of threat of nutritional problems. If this is achieved it will be an important motivator for them to develop positive attitude towards nutrition.

Perceived benefits - This refers to a person's perception of the effectiveness of various actions available to reduce the threat of illness or disease (or to cure illness or disease). The course of action a person takes in preventing (or curing) illness or disease relies on consideration and evaluation of both perceived susceptibility and perceived benefit, such that the person would accept the recommended health action if it was perceived as beneficial. This nutrition education programme will therefore be used to help the subjects develop

healthy nutritional attitude. Sometimes, the action that the person perceives as effective and available may be easy and convenient. But on the other hand, it may be inconvenient, unpleasant, expensive painful or otherwise very undesirable. If such negative traits seem to outweigh the presumed benefits to his health, he may choose some other less unpleasant actions or may not do anything. Nutrition education programme of this study will try as much as possible to help the subjects regard any threat to health as urgent and one that requires immediate and adequate attention.

Perceived barriers - This refers to a person's feelings on the obstacles to performing a recommended health action. There is wide variation in a person's feelings of barriers, or impediments, which lead to a cost/benefit analysis. The person weighs the effectiveness of the actions against the perceptions that it may be expensive, dangerous (example, side effects), unpleasant (example painful), time-consuming, or inconvenient. In health education according to Cooke and Romweber (2000), efforts are made to help recipients make healthy decisions through some form of persuasive communications directed towards increasing the salience of beliefs about severity of and susceptibility to health problems; and the benefits of the recommended treatment or actions while minimizing barriers. The nutrition education programme of this study will try as much as possible to help the rural women understand the severity of deficiency health problem and see themselves as highly susceptible to such problems.

Locus of control- Locus of control also has an impact on health decisions according to Rosenstock et al. (1994). It suggested that people are motivated to explain and appreciate the cause of certain things, especially in situations that are relatively not clear. If people believe that their behaviour reduces the chances of developing a health problem, they are said to have an internal locus of control. If on the other hand, they believe that whether or not they develop the health problem is out of their control, they are said to have an external locus of

control. Those with an internal locus of control are more likely to take responsibilities for their health decisions as well as the results of such health decisions. The subjects of this study will be encouraged to feel that they are capable of taking care of their nutrition problems. Health locus of control may be affected by different variables, like the value placed on health, economic status, health knowledge and level of education.

Self-efficacy - This according to Rosenstock et al. (1994) refers to the level of a person's confidence in his or her ability to successfully perform a specific behaviour. This construct was added to the model most recently in mid-1980. Self-efficacy is a construct in many behavioral theories as it directly relates to whether a person performs the desired behaviour. In health education, one of the goals is to make people self-sufficient. In this study, the subject will be encouraged to know how to do a behaviour and want to do it. While locus of control applied in a general way, self-efficacy is linked to a specific behaviour. It is a better predictor of behaviour because it is more specific in terms of behaviour, setting and time.

Theoretical Studies

The Importance of Community-Based Educational Programmes

Community-based education programmes play an important role in the improvement of the health of the people. Mcguire and Popkin (2004) opined that community-based education programmes are strategies that are designed to reach people outside of traditional health care settings. These settings may include: Schools, worksites, health care facilities and communities.

Agbonjinmi and Cole (2005) documented that community-based education programmes encourage and enhance health and wellness by educating communities on topics such as: Chronic diseases, injury and violence prevention, mental illness/behavioural health,

Unintended pregnancy, oral health, tobacco use, substance abuse, nutrition, obesity prevention and physical activity.

Health and quality of life rely on many community systems and factors, not simply on a well-functioning health and medical care system (Onwuzurike & Uzochukwu, 2001). Making changes within existing systems, such as improving school health programmes and policies, can effectively improve the health of many in the community.

Hutchison (2010), clearly emphasized that for a community to improve its health, its members must often change aspects of the physical, social, organizational, and even political environments in order to eliminate or reduce factors that contribute to health problems or to introduce new elements that promote better health. These changes according to Hutchison might include: instituting new programmes, policies, and practices, changing aspects of the physical or organizational infrastructure, and changing community attitudes, beliefs, or social norms. Community based nutritional education will therefore be used in this study to improve the health knowledge and attitudes of the subjects and to eliminate or reduce factors that contribute to the nutritional problems. According to the American Dietetic Association (2003), in cases where community health promotion activities are initiated by a health department or organization, organizers have a responsibility to engage the community in interactive sessions.

Factors that influence nutrition education

McGure and Popkin (2004), submitted that the nature of the food supply and people's access to it are obviously fundamental to nutritional well-being. Cultural practices and traditions influence the actual choices that people make. A traditional role of nutrition education has been to increase the capacity of the household to use existing food resources to maximum advantages, particularly in relation to breast-feeding, weaning, and supplementary

feeding of children, dietary practices during infectious disease, nutrition during pregnancy, and food hygiene. Education on the ways to produce food at the household level and on ways to store, process, and prepare these foods has also been incorporated into many programmes (FAO/WHO, 2005).

As already mentioned by McGuire and Popkin (2004), one of the principal aims of nutrition education is to provide people with adequate information, skills and motivation to procure and to consume appropriate foods. In this study community-based nutrition education programmes will be used to help the rural women to focus on strategies to improve family food supplies. Efficient utilization of available food and economic resources to provide well balanced diet and better care for vulnerable groups will be provided.

Relationship between Knowledge and Attitude

Berge (2004), explained that programmes to change behaviour often include information to improve people's knowledge about an environmental problem or its solution in the hope that it motivate them to make a change. But there are decades of research to show that on its own information is very unlikely to lead to a measurable change in attitude. Information may change and improve people's knowledge of a problem or contribution to a change in their attitude towards it (Buttress 2010). According to Cobb and Kasi (2006), there is vast gulf between knowing about a problem and doing something about it, as anyone who has tried to give up smoking or lose weight knows. The only time where information is likely to lead directly to a change in attitude is when lack of knowledge is the only barrier to change.

Despite the fact that simply understanding the problem will not necessarily lead to behaviour change, trying to improve people's understanding of a problem like climate change and its impacts has intrinsic value. Packman and Kirk, (2004) were of the view that the more

members of our community understand a problem, the greater the momentum to solve it and the more likely that changes will be supported. Knowledge or information based programmes should not mourn the fact that the link between understanding and attitudinal change may be a distant one. In the study the nutrition education programme will therefore be used to help the subjects develop healthy nutritional attitude. If the aim is to improve knowledge for its own sake, then that should be the clear and unapologetic objectives against which the programme measures its success.

A Framework for Planning Nutrition Education programmes

Mishra and Retherfold (2009), proposed that the role of a nutrition educator should be of help people irrespective of their social, economic, or political circumstances, to meet their need for nutritious food. Nutrition education, no matter how broadly defined, cannot resolve these complex social and economic problems. According to Maynard (2000), it has a role to play in providing support for migrating populations. Those newly arrived in urban industrialized food supply and limited-purchasing power are also beneficial. It has been said by Reynolds, Hinton and Shewchuk (2008), that urbanization often turns knowledgeable food producers into native food consumer programmes within this framework according to them could be designed to promote the knowledge, skills, and supports needed to be adequately nourished, and to avoid as far as possible the social and economic costs of malnutrition and disease. Depending on the situational analysis, such programmes might include a wide range of education and other methodologies. For example Oseni (20001), explained that to increase urban dwellers' access to more affordable traditional foods (growers markets in the city) and revalue these food to help people understand what is good nutritional value for money in the market-place and to be critical of the vigorous advertising of the least nutritious foods; to provide nutrition education for school children; and to

implement or advocate feeding programmes and nutrition education for parents in schools and day-care settings or to provide or advocate affordable, nutritious food at worksites. In this study strategies that will commonly used in rural community programmes, such as social mobilization and community development, may also have value and relevance in urban environments to increase local community control over nutrition issues and provide social support for improved nutrition.

Well nourished individuals are healthy individuals. Bogart and Jean (1999) posited that healthy individuals make a healthy family. Healthy families make a progressive community because its members are happy, active, and can participate well in community activities. On the other hand Bogart, et al. further explained that for a community to be healthy, it should provide for the health needs of its members by establishing health centers and other medical facilities (hospitals, clinics, etc); launch cleanliness campaigns, maintain systematic garbage collections, provide garbage disposal units and from time to time hold meetings to make people aware of their community responsibility. Likewise, according to Bogart, et al (1999) it should intensify food production campaigns like backyard gardening and tree planting, feeding programmes for malnourished and undernourished children, nutrition education classes for mothers and other community members.

Health education therefore, according to World Health Organization (2002), is aimed at providing people with adequate information, skills and motivation to procure and to consume appropriate foods. Nutrition education focuses on strategies to improve family food supplies and efficient utilization of available food and economic resources to provide well balanced diets and better care for vulnerable groups.

The goal of nutrition education, according to FAO/WHO (2005) is to reinforce specific nutrition-related practices or behaviours to change habits that contribute to poor health. This is done by creating a motivation for change among people, to establish desirable

food and nutrition behaviour for the promotion and protection of good health. People are given help to learn new information about nutrition and to develop the attitudes, skills and confidence that they need to improve their nutrition practices.

According to Guthrie (1999), nutrition education provides people with correct information on the nutritional value of foods, food quality and safety, methods of preservation, processing and handling, food preparation and eating to help them make the best choice of foods for an adequate diet. However as Packman and Kirt (2004) posited, the provision of correct information is not in itself a sufficient objective to improve nutrition. Successful nutrition education goes beyond the simple accumulation of knowledge, towards positive action. A change in behaviour, Cerqueira (2004) agreed, could lead to desirable nutrition practices. Effective nutrition education programmes must therefore be planned and executed in such a way as to motivate beneficiaries to develop skills and confidence for the adoption of positive and lasting practices. Successful nutrition education often entails the active participation of the people their awareness of their nutrition problems and their willingness to change.

Empirical Studies

Studies on Nutrition Knowledge, Attitude and Practices

Empirical studies on nutrition knowledge, attitude and practices of education students which were reviewed for this study are reported below:

Mohammed, Neda and Kazeem (2011), carried out a study designed to help researchers understand the nutrition knowledge, attitude and practices of college students of the Azad University of Gourgan. The target population consisted entirely of students of Azad University.

A standard questionnaire which was developed to measure the participant's nutrition knowledge, attitude and practices was randomly distributed among 360 students. The reliability analysis yielded Cronbach Alpha values of 0.80 for the knowledge and 0.81 for the attitude scales. The collected data were analyzed by the t-test, Pearson Product Moment Correlation Coefficient and one-way ANOVA at 0.05 level of significance.

The results showed that the nutrition knowledge score were the highest in the nursing students and were the lowest in business management students. The ANOVA results showed that there were significant differences among the nutrition knowledge of all the students. In addition, the nutrition attitude scores were the highest for physical education and were the lowest for business management, and the differences between nutrition attitudes among all of the majors were significant. Furthermore, there was a positive and significant correlation between the nutrition knowledge and attitude of the female $P < .0001$

In reviewing studies on community based educational programme on nutritional attitude using independent variables the Chinese-American Association and Wei Yue Sun Research and Development Unit (2009) carried out a study on education programme on nutrition and the dietary behaviour of Chinese-American College Students, New York to investigate dietary predisposing, enabling, reinforcing factors and dietary behaviour among Chinese-American College students with a community-based nutrition education programme (Group 1) and those without the programme (Group 2). A total of 218 students participated in the study.

A Precede model was employed to collect pre-and post-test data. Students in Group 1 improved perception of diet and health, dietary instruction, social support, and dietary behaviour significantly after joining the programme. Although not significant, students in Group 1 improved nutritional knowledge and media influence after completing the

programme. In conclusion, these results suggest that PRECEDE components are important in changing dietary behaviour.

Sovyanhadi and Cort (2007) carried out a study on the effectiveness of Various Nutrition Education Teaching Methods for High School Students in Alabama, United States. This study examined a nutrition education program consisting of two content sessions: food-label reading, and food pyramid guide. In each session two groups of nutrition interns utilized four teaching methods: role-play/video presentation/display, grocery store tour, overhead transparency and lecture, and power point lecture, among a group of (N = 29) ninth grade, high school students.

The purpose was to determine the most effective method of delivering nutrition education to high school students. Analysis using the Kruskal Wallis One-way Analysis of Variance showed that the combination method of role-playing/video presentation/visual display was most effective in the food pyramid session ($\chi^2 = 8.13$, $p = .04$). While this method was given the highest rank in the food-label reading session it was not statistically significant.

These results showed that a combination of nutritional knowledge and attitude methods classified as the teacher's style, is more effective than a style that involves a single teaching method. The study concluded that some methods are much more effective than other when it comes to implementing nutrition education programmes.

Saha, Poddar and Mankad (2011) examined the effectiveness of different methods of health education in Ahmedabad, India. The purpose of the study was to make a comparative assessment of different methods of dissemination of nutritional health education among educated people.

A survey research was conducted involving 142 randomly selected subjects during the last session of a five-day conference having health as main theme when the opinion of

the delegates regarding different communication methods was asked for. Collected data was analyzed not only to find out the optimum mode of education dissemination in such a setting but also to find the contribution of different factors in the preferences of the study subjects.

The results showed that participants opted more (60%) for focused programmes of smaller audience (sectional program). In both broad area (main program) and focused area programmes (sectional), the participants preferred lectures (62% and 65.7% respectively). Specific topics were preferred both in lectures (67.6%) and symposia (57.7%).

This study concluded that while planning for nutritional health education dissemination in an educated group a focused programme should be formulated in small groups preferably in the form of lectures on specific topics, more so while dealing with participants of higher age group having higher educational qualification.

Makata (2013) carried out a study to determine the effects of two teaching methods on sexual health knowledge and attitudes of secondary school students in Enugu State of Nigeria using quasi experimental design. The purpose of the study was to determine the mean gain sexual health knowledge and attitude scores of secondary school students in male, female, urban and rural schools after use of lecture and Socratic Questioning teaching methods. The population of the study consisted of 16,510 senior secondary school students. Two instruments, Sexual Health Knowledge Test (SHKT) and Sexual Health Attitudes Questionnaire (SHAQ) were used. Student t-test and ANOVA were used to test the hypotheses.

The result of the study showed that there was a significant difference ($p < 0.01$) in the sexual health knowledge mean gain scores of the students in relation to the two teaching methods. There was no significant difference ($p > 0.05$) in male and female schools, but there was a significant difference ($p < 0.001$) in urban and rural schools for the two teaching methods. The research concluded that public and school

health educators should intensify efforts to use lecture for health-instructions of adolescents to help improve their sexual health knowledge and attitudes.

A study was carried out by Moore, Pawloski, Rodriguez, Lumbi and Ailinger (2009) to examine the effect of a community-based nutrition education programme on the nutritional knowledge, hemoglobin levels, and nutritional status of Nicaraguan adolescent girls and the nutritional knowledge of their mothers. This longitudinal study used a mixed quantitative/qualitative design to study the effect of the nutrition education programme. The non-probability sample consisted of 182 adolescent girls and 67 of their mothers. The setting for the study was a community (Barrio) in Managua, Nicaragua. A team of nurse and nutrition researchers created the nutrition education programme designed to improve girls' and mother's nutrition-related self-care operations. Data collection was carried out for 4 years for girls and 2 years for mothers in Managua, Nicaragua, using questionnaires, a HemoCue, and anthropometric measures.

The findings of this study were that girls' and mothers' nutritional knowledge scores significantly improved in most cases after participation in the nutrition intervention programme. Girls' hemoglobin levels did not significantly improve and their nutritional status findings were mixed. Girls and mothers described what dietary changes girls made and why.

In a study to examine the effect of nutrition education on knowledge of nutrition in relation to prevention of stomach cancer among undergraduates in South-West, Nigeria Anetor, Ogundele, and Oyewole, (2012), adopted a quasi-experimental research design for the study. Multi-stage sampling was used to select 436 male and female undergraduates between 16-25 years old from two universities in South-west Nigeria (one control and one experimental). The intervention consisted of lectures on nutritional factors of stomach cancer one hour weekly for 8 weeks and a placebo lecture on HIV/AIDS stigmatization for the control group. A validated self-structured questionnaire was used to

collect the data for the pretest and posttest. Demographic characteristics were analyzed with percentages; variables were analyzed using t-test and ANCOVA set at 95% confidence interval. Nutrition education improved knowledge of nutrition in the participants ($p < 0.00$). The experimental group displayed higher nutrition knowledge compared to control. Level of study affected participants' nutrition knowledge; students of lower level study performed better ($p < 0.00$). Gender also affected participants' nutrition knowledge; females performed better than males ($p < 0.00$). More nutrition education should be encouraged in school settings to improve knowledge of nutrition in order to prevent a possible dietary risk of stomach cancer and other chronic diseases

The study by Audu, (2013) investigated the effect of nutrition education programme on food-related-knowledge and attitudes of literate women in Pankshin community. The non-randomized control group pretest posttest quasi-experimental design was employed for the study. The instruments for data collection were a self developed 53 items nutritional knowledge and attitude questionnaire (NKAQ) and 24 content 12 weeks unit plans. The findings of the study showed that there was statistical significant difference between the mean scores of the nutritional knowledge of women exposed to nutrition education programme (NEP) and those not exposed to NEP. There was statistical significant difference between the mean scores of the nutritional attitudes of the women exposed to NEP and those not exposed to NEP. Level of education has no significant influence on the nutritional attitudes of the women. Age has no significant influence on the nutritional attitudes of the women. Based on these findings, suggestions were proffered on ways to curtail the problems of nutritional disorders

Virginia, Beverly Henry, Amy. Ozier and Josephine, (2010) in their own study to assess the effect of nutrition education on consumers' knowledge, attitude, and behavior toward trans fatty acids in foods. The research was conducted utilizing a Solomon four-group

design with 47 participants. Two measures were developed to evaluate the impact of the nutrition education session: (i) a questionnaire adapted from International Food Information Council materials and (ii) review of grocery store receipts for trans fat-containing products. A comparison of pretest and posttest results for participants in the experimental group showed significant improvement on these items: an increase in “always” looking at the ingredient list when purchasing packaged food, considering fat when purchasing foods, selecting the healthier choice based on the ingredient list, and feeling more knowledgeable and more confident. Also, examination of grocery receipts after 2 weeks showed that participants purchased a lower proportion of foods containing trans fatty acids. These results suggest that nutrition education sessions can promote an improvement in consumer understanding and food purchasing patterns. Oosthuizen, (2010) assessed the impact of a nutrition education programme on nutrition knowledge and dietary intake practices of primary school children in Boipatong. The first phase of this study was to assess the nutritional status and nutritional knowledge of primary school children within a peri-urban community, through the implementation of a situational analysis. Validated 24-hour (hr) recall, food frequency (FFQ), nutrition knowledge and health questionnaires were used to conduct the situational analysis of this community. Parents (n=52) representative of 400 (13.0 percent) children voluntarily agreed to participate and 45 children completed the baseline survey. Results indicated a community faced with poverty as unemployment (60.9 percent) was high, education levels amongst the parents ranging between primary (33.3 percent) and secondary school (54.9 percent).

The dietary patterns of the children revealed a carbohydrate-based diet with very few (n=2) consuming a variety of fruit and vegetables. Some nutrition knowledge amongst the children was evident, with a mean 60.2 percent in correct answers for the true/false questions. The children within the community were at risk of becoming stunted, with small numbers

having deficiencies in iron. Therefore, it was decided to implement a nutrition education programme (NEP) in the second phase of the study to address malnutrition amongst primary school children. The objectives of the second phase were 1) to implement a NEP amongst the primary school children to assess the impact on nutrition knowledge and dietary practice, and 2) to determine the retention of knowledge after nine months and whether any correlation occurred between knowledge and dietary practices.

The school environment was chosen to ensure attendance and create a suitable learning environment to which the children were already accustomed. Two groups, namely experimental (n=82) and control (n=91), were assigned for this study. The control group received no form of nutrition education during the intervention period. The experimental group received nine 45 minute lessons over a period of nine weeks. The nutrition education tools (NETs) were made up of a text and activity book, supplemented by a card and board game. Pre- and post-nutrition intervention knowledge and 24-hr recall questionnaires were completed to assess differences in nutrition knowledge and dietary practices between the two groups. The intervention made a significant impact on the nutrition knowledge of the experimental group, with a 13 percent improvement between pre and post results.

Norma, Jan, Ann, Jean and Phillip, (1997) assessed the effects of a group nutrition education program (GNEP) on nutrition knowledge, nutrition status, and quality of life in hemodialysis (HD) patients. A 5-month study of patients on HD receiving group nutrition education compared to a control group of HD patients receiving individualized monthly nutrition counseling. Pre-study and post-study, participants completed a questionnaire that assessed nutrition knowledge and solicited demographic data and the Medical Outcomes Trust Short Form 36 Quality of Life Health Survey (SF-36). Laboratory test results for albumin, potassium, phosphorus, and calcium levels were recorded pre-study and post-study along with dry weight and fluid gains. The Setting was a two free-standing dialysis centers

that treated approximately 40 to 75 patients daily. Sample consisted of eighty-seven chronic HD patients (group education: n = 53, control: n = 34) who had been on dialysis an average of 23 months.

The GNEP teaching and support program consisted of five monthly 45-minute sessions conducted with nine groups of 7 to 10 HD patients seated in the same area while undergoing their HD treatment. A standardized format was used for each session. Main outcome measured included changes in pre-study and post-study nutrition knowledge, nutrition status as indicated by laboratory values, and quality of life as assessed through the SF-36.

The results showed that Patients in both groups had significantly improved albumin levels from pre-study to post-study. Nutrition knowledge scores improved in the GNEP cohort, but not at a statistically significant level. The GNEP had significantly improved composite scores on the SF-36 from pre-assessment to post-assessment. There were no significant differences between the control and GNEP cohort in any of the parameters measured. In conclusions the group education may be an effective as well as efficient method for providing nutrition education to HD patients.

Gupta and Kochar, (2008) in their study on the role of nutrition education in improving the nutritional awareness among adolescent girls assessed the nutritional awareness of 50 school going adolescent girls of 13-16 years age in rural area of district Kurukshetra before and after imparting nutrition education regarding healthy nutrition and dietary habits. To them, the nutrition education was imparted through lectures, audiovisual aids and demonstrations for three months. Before and after imparting nutrition education, the level of knowledge, attitude, beliefs and practices regarding good nutrition was adjudged by questionnaire cum interview method. To see the awareness level, scoring system consisting of scores between -1 to +1 depending on each question was developed. After providing

nutrition education, a significant improvement in their nutritional knowledge was viewed and quantum of improvement was 1.67 times.

The analysis of data also inferred that the students scoring more marks in science subject were found more attentive during the counseling sessions and had showed a rapid improvement in their score. The study was successful in identifying certain gaps in their knowledge, attitude and practices before imparting nutrition education and concluded that such awareness programmes should be organized.

Walsh, Dannhauser, and Joubert in 2009 carried out a study to determine the impact of a nutrition education programme, implemented using local nutrition advisors, on knowledge of nutrition and dietary practices in low-income coloured communities in the Free State and Northern Cape provinces. A nutrition education and food aid programme was implemented for 2 years in one urban and three rural areas. Two rural control areas were included where food aid was given, but no nutrition education. Knowledge of nutrition and dietary practices were measured using a structured questionnaire before (608 respondents) and after intervention (672 respondents).

The results of the study showed that in contrast to control areas, knowledge of what to eat daily to remain healthy improved significantly by between 42.2% and 52.6% in rural intervention areas. The percentage of rural households that included three food groups (protective foods, energy foods and building foods) in their cooked meal improved by 32.6 - 38.8%. Improvements of between 7.0% and 12.9% were observed in the percentage of respondents who knew that milk is healthier to drink than non-dairy alternatives. The median percentage of household members using more than two cups of milk per day improved significantly, by between 14% and 100%. A significant improvement in vegetable and fruit intake was also observed. In concluding, the authors suggested that a community-based

nutrition education programme can contribute to knowledge of balanced, economical nutrition and dietary practices in low-income communities.

Maria Wijaya-Erhardt, Siti Muslimatun and Juergen G Erhardt, (2013) assessed the effects of a health and nutrition educational intervention on maternal knowledge, attitudes and practices. Pre-and post-test design using structured interviews of pregnant women was used. The setting was thirty-nine villages in Central Java Province, Indonesia. Pregnant women ($N = 252$) at 12–20 weeks of gestation were randomly allocated at the village level into education intervention and control groups. Women in the intervention group received health and nutrition education, while those in control group did not. Educational sessions were provided monthly until delivery. After the intervention, women in the education group had better knowledge about the risks and consequences of getting worm infection and the causes, consequences and prevention of anaemia during pregnancy; expressed stronger intentions to feed colostrum (91.9% vs. 78.2%, $P = 0.003$); to breastfeed within one hour of birth (80.4% vs. 68.9%, $P = 0.004$); to breastfeed exclusively for six months (77.2% vs. 62.7%, $P = 0.014$); to breastfeed for 24 months ($P = 0.06$); and also had better knowledge of practices related to the early initiation of breastfeeding (0.5 hour [25th–75th 0.5–6] vs. two hour [0.5–17.5], $P = 0.052$); of 24-hour exclusive breastfeeding (51.2% vs. 31.1%, $P = 0.006$); of giving birth at health facilities (71.9% vs. 58%, $P = 0.024$); and of birth assisted by skilled birth attendants (90.1% vs. 81.5%, $P = 0.057$) than their control counterparts. In concluding the authors observed that the reported change in knowledge, attitudes and reported practices may be attributable to the health and nutrition education provided during pregnancy.

Effect of Nutrition Knowledge and Attitudes of Mothers

In China, Struemper (2003) conducted a research on the effect of health and nutrition education intervention on women's postpartum beliefs and practices: a randomized controlled trial. The study design was a randomized controlled trial conducted in both urban and rural area of Hubei between August 2003 and June 2004. A total of 302 women who attended the antenatal clinic during the third trimester with an uncomplicated pregnancy were recruited. Women randomized to the education intervention group in both urban and rural area received two-hour prenatal education sessions and four postpartum counseling visits. Control group women received usual health care during pregnancy and postpartum period. Women were followed up until 42 days postpartum. Outcome measures were nutrition and health knowledge, dietary behavior, health behavior and health problems during the postpartum period. Women in the intervention groups exhibited significantly greater improvement in overall dietary behaviours such as consumption of fruits, vegetables, soybean and soybean products as well as nutrition and health knowledge than those in the control groups. Significantly more women in the intervention groups give up the traditional behaviour taboos. The incidence of constipation, leg cramp or joint pain and prolonged lochia rubra was significantly lower in the intervention groups as compared with the control groups.

In conclusion, the study showed that health and nutrition education intervention enable the women take away some of the unhealthy traditional postpartum practices and decrease the prevalence of postpartum health problems. The intervention has potential for adaptation and development to large-scale implementation.

In a study to evaluate the impact of nutritional education on knowledge, attitude and practices (KAP) of mothers concerning infants and young children feeding and their children's nutritional status, Sule, Abiona, Fatusi, Ojofeitimi, Esimai, Ijadunola (2009)

carried out a prospective study in two rural communities of South-west Nigeria. This was a community intervention study. One hundred and fifty

mothers of children aged 0-18 months were independently recruited from the intervention and control communities through a multi-stage sampling technique. Data were collected with the aid of an interviewer-administered questionnaire at baseline and at six months after intervention from both communities to obtain information of feeding of infants and young children. Intervention involved group counselling of mothers and food demonstrations at designated health facilities. Data analysis for quantitative data was done using Epi-Info software, and for qualitative data, content analysis of major themes was used.

Results showed that before intervention, recruited mothers and their children from the two communities were comparable in terms of all the parameters assessed ($P>0.05$ in all cases). After six months of intervention, mothers who had nutritional education demonstrated better knowledge and attitudes to key infant and young children feeding recommendations. There was also limited improvement in feeding practices. Mothers from the intervention community exclusively breastfed their infants longer with mean age at introduction of complementary foods at 5.3 months compared to 4.5 months in the control community ($P<0.05$), who breastfeed their children longer ($P<0.05$). However, there was no statistically significant improvement in the weight of their children. The study concluded that nutritional education of mothers only had positive impact on their level of KAP on infant and young children feeding.

Jaffer, Afifi and Alouhishi (2009) investigated the knowledge, attitude and practice (KAP) of young children's mothers on infant feeding and to evaluate the effects of nutritional education in the rural areas. A cluster sampling method was used to select the local health station. Five hundred and fifteen mothers, who had infants aged 4-6 were recruited for the questionnaire survey on the nutritional knowledge in rural areas of Tianjin municipality. The

mothers were randomly divided into intervention group I (160), intervention group II (180) and control group (175). The mothers in the intervention group I were educated with feeding guideline on infants and young children and had Group lectures and advisory from experts about maternal and child nutrition for teaching them how to feed their children; while, the mothers in the intervention group II were trained with feeding guideline on infants and young children by themselves; and the mothers in the control group received routine guidance at the local health station. The follow-up evaluation on nutritional knowledge of the mothers in each group was carried out after 3 and 6 months intervention, respectively.

The results of the study showed that educational background had significant effect on KAP scores: KAP scores of the mothers with primary education or less (8.3 ± 2.2) were significantly lower than that of the mothers educated with high school (9.4 ± 1.6) and university (9.6 ± 1.8) (LSD $t = 3.70$, $P < 0.001$). After being educated with feeding guideline on infants and young children, the knowledge of infant's mothers was greatly improved and KAP scores of the mothers after intervention were higher than that of the baseline ($F = 183.556$, $P = 0.006$); the percentage of correct answer on nutrition knowledge in the intervention groups was significantly higher than that of the control group. At six months of intervention, the KAP scores of intervention group I (12.0) and intervention group II (11.6) were higher than that of the control group (10.5) (LSD $t = 5.96$, $P < 0.002$; LSD $t = 4.25$, $P < 0.001$). In conclusion, providing nutritional and health education to the infant's mothers should be helpful for improving infant's feeding pattern and ensuring the adequate growth and development of infants.

A study on the impact of nutrition education on rural women of Jodhpur region was carried out by Raka Srivastava and Kumkum Rankawat (2001) in India. The research had the following objectives: (1) To find out the existing nutritional knowledge in women at various levels. (2) To develop a nutritional intervention programme for women empowerment in rural

sector. (3) To assess the knowledge gain through intervention programme by pre and post test.

The study was conducted in purposively selected Panchayat Samiti, Shergarh of Jodhpur region. Rural women in Shergarh were having low awareness in relation to health and Nutrition. A sample of 400 rural women who were ready to participate and interested to be involved in training programme for their self empowerment were purposively selected for this study. The women aged 15-35 years belonged to the middle to low economic group. As a preliminary step good rapport was established with the key leaders, women and teachers of the village schools. A base line survey was conducted by making home visits and interviews to elicit information on socio-economic back ground of the families.

A semi structured pre tested questionnaire was designed and administered to gather data on socio demographic profile and to check the nutritional status. It observed that uneducated women did not want to bring change in their household pattern. The study concluded that the impact of developed package in empowerment of rural women in terms of knowledge gain revealed that before the training the awareness of respondents was poor. After training majority of the women responded gain in knowledge. It has been revealed from the study that the overall impact of nutritional intervention programme in empowering the rural women was effective in achieving the objectives.

In Kenya, Nyakuru (2009) undertook a research between 2002-2008 on the assessment of knowledge, attitude and practices of trained community resource persons, the case study of the Mbooni community based nutrition programme in Mbooni and Kisau Divisions of Makueni District. The study was to assess particularly, the Community Health and Nutrition Workers' (CHNWs) current level towards health and nutrition issues, using quasi experimental design.

A questionnaire which was divided into four main sections namely, demographic, knowledge, attitude and practices based on the curricula used for training were administered to all the CHNWs. Six Focus Group Discussions were conducted to provide information on the attitude and practices of the community health and nutrition workers and also verify the information collected by the use of a questionnaire. The Focus Group Discussions were conducted with three groups of mothers with children under five years old, Participatory Approach to Nutrition Security (PANS) teams from both divisions, and community members who hold public responsibilities. A grading system was established and from the scores, percentages were derived and a cut off point set. All those who scored, half and above the expected points were classified as having adequate knowledge, while those who scored below half of the expected score had inadequate knowledge.

The findings indicated that half of the interviewed community health and nutrition workers did not have adequate knowledge, while the other, half had adequate knowledge. This meant that half of them had forgotten what they were taught, even though it was noted that these were people with fairly good formal education. In attitude and practices majority of them were positive and affirmed, that the training received from the programme was adequate and had helped them in their service delivery. It was good and had helped them as individuals as well as their families and community, since a majority willingly shared it. They were happy with their work and acknowledged that the community held them in high esteem. However, data implied that Kisau division performed better with a statistically significant difference in the total practice score than Mbooni ($p < 0.001$). There was also a significant difference in the total knowledge score between those who had received refresher training compared to those who had not received any other apart from that given by the Community - Based Nutrition Programme. Those who had refresher training scored better than, their counterparts ($p < 0.006$). Also those

above 35 years of age scored higher as opposed to those less or equal to 35 years ($p = < 0.03$).

The study therefore, recommended that nutritional programme should conduct regular refresher training for those already trained, train more new community health resource persons to ease the workload.

In a study to ascertain the effects of teaching contraceptive use on the health knowledge and attitudes of post partum multiparous mothers in Anambra State of Nigeria, using a quasi-experimental design. Agu (2013) selected 300 women into treatment and randomized groups. Two instruments were used for the collection of data namely Family Planning Knowledge Test (FPKT) and Family Planning Attitude Questionnaire (FPAQ). t-test and ANOVA were used to test the hypotheses. The reliability of the items on FPKT was established using the Kuder-Richardson technique, while that of the FPAQ was analyzed using Cronbach's Alpha reliability technique.

The result of the study showed that there was a significant difference ($p > 0.001$) in the mean health knowledge score of the post partum multi-parous mothers in the two study groups after giving contraceptive use instruction to the experimental group. Similarly, there was a significant difference ($p > 0.001$) in the mean gain attitude score of subjects in the two to the experimental group. In conclusion, the study recommended that variables like age, educational level and marital status should be kept in mind by physicians and family planning providers in promoting contraceptive methods.

Summary of Reviewed Literature

The purpose of this study was to determine the effects of community based nutrition education programme on nutritional knowledge and attitude of rural women in Idemili South L.G.A of Anambra State. In order to achieve the stated purposes and to answer the research questions review of related literature was carried out in relation to the variables of interest and it covered the concepts, theoretical framework, theoretical studies and empirical studies.

Nutrition is a popular concept that has been used in many areas of public health. Nutrition has a range of definitions and has been applied in different setting (Ewuzie, 2004, Hornby, 2000, & Ngwu, 2002) described nutrition as the study of composition of food and the utilization of food by the body. According to WHO (1992) nutrition status is a measure of the health condition of an individual as affected primarily by the intake of food and utilization of food.

Agbonjini and Cole (2005) explained that one of the principle aims of nutrition education is to provide people with adequate information, skills and motivation to procure and consume appropriate food. However, there is mixed evidence as to whether nutrition education works or not (Bogart and Jean 1999), but it has been found to have positive out-comes in that well nourished individuals are healthy individuals. Bogart and Jean (1999) maintained that healthy individuals make a health family, healthy families make a progressive community because its members are happy, active and can participate well in community activities. Knowledge is defined by John (1999) as expertise and skills acquired by a person through experience.

Many authors, Stretch (2010) and Barzilai (2003) have different definitions about community but they defined and concluded community is a group of interacting people, living in some proximity. Literature reviewed also highlighted the important nutrients the body needs and what their deficiencies could result to.

The reviewed for this study health belief model (HBM) emphasized that health-related behaviour about nutrition are the desire to avoid illness or conversely get well if already ill and the belief that a specific health action will prevent or cure illness or malnutrition from poor feeding.

Studies according to Barzilai (2003) shows that the nutritional knowledge and attitudes of rural women were generally poor. The effects of these are on their children in the form of increased risk of chronic and oral diseases, malnutrition, stunting and foetal growth and low birth weights among others.

Furthermore, studies on community based educational programme on nutritional knowledge and attitude based on independent variables of age, levels of education and occupations were reviewed. All these studies were carried out outside Nigeria and in Nigeria but to the best of the researchers knowledge none was done using community based education programmes on nutritional knowledge and attitude of rural women.

It is against this background that the present study was designed to determine the effects of community based nutrition education programme on nutritional knowledge and attitude of rural women in Idemili South L.G.A of Anambra State. It is hoped that this would be a baseline study for other further works in this area in Nigeria and in Anambra State in particular.

CHAPTER THREE

METHOD

This chapter discussed the method that was used for the study which includes: Research Design, Area of the Study, Population of the Study, Sample and Sampling Technique, Instruments for Data Collection, Validation of the Instruments, Reliability of the Instruments, Intervention Procedure, Control of Extraneous Variables, Methods of Data Collection, and Method of Data Analysis.

Research Design:

The design for the study was quasi experimental research design. Specifically, it used pre-test, post test non control group. This design seeks to establish the cause and effect relationship between the variables of interest. It is a design where observations are made in the study group before and after interventions and subjects are assigned to groups without complete randomization (Araoye 2003, Akubueze, 2010; and Shuttle, 2008).

Quasi experimental design was used because random assignment of subjects was not possible. In addition, some researchers who conducted similar studies to examine the effects of nutrition education on rural women's knowledge, attitudes and behaviour also used quasi experimental design. Abiona, Esimai, Fatusi, Ijadunola, Ojofeitimi, and Sule (2009). Makata (2013) also used quasi experimental design in a similar study to determine the effects of two teaching methods on sexual Health knowledge and Attitudes of secondary school students in Enugu State. The researcher therefore considered this design to be suitable for the study.

Area of Study

The study was carried out in Idemili South Local Government Area of Anambra State. Idemili South which is one of the Local Government Areas in Anambra-State, is made up of

seven towns – Alor, Akwa Ukwu, Awka-Etiti, Nnobi, Nnokwa, Oba and Ojoto with total population of 206,816. (National Population Commission, 2006). Idemili South is bounded by the following LGAs; in the East by Nnewi North and South, in the West by Onitsha South, in the North by Idemili North and in the South by Ekwusigo L.G.A. Majority of the women in this local government area are farmers, few are petty traders, civil servants and house wives.

In these areas, different types of food are grown in abundance by these women and some of these food items are sold in the markets for economic gains without minding their health implications. Cocoyam is produced in abundance even in season and out of season. Their staple food is fufu and bitter leave soup without minding other nutritious food. Personal experience of the researcher has shown that these women lack knowledge of nutrition and their attitude towards nutrition is also not encouraging. The effect of these is on their children, increased risk of chronic and oral diseases, stunting and foetal growth and low birth weight. It is therefore necessary to have a study like this present one designed for these rural women that will help improve their nutritional knowledge and attitudes.

Population of The Study

The population of the study comprised all the 220 women in all the social clubs in the 7 towns that make up Idemili South LGA of Anambra State. This category of women was chosen because it is assumed that their lifestyle have great social influence on other women in the area. It is therefore assumed that their knowledge of nutrition and adequate nutritional attitudes will be strong determinants of other women's knowledge and attitude about nutrition.

Sample and Sampling Techniques:

The sample for the study comprised of 204 members of social clubs in the 9 sampled villages. Multi stage sampling procedure was used.

In stage one all the seven existing towns in Idemili South Local Government Area were listed. Simple random sampling by balloting without replacement technique was used to get three towns for the study, namely Awka-Etiti, Oba and Ojoto (Appendix A).

In stage two all the villages in each of the three selected towns were listed. Altogether there were 24 villages in the three towns which included Awka Etiti – 7 villages, Ojoto 8 villages and Oba 9 villages. In stage 3 in each of the three selected towns, three villages were selected through simple random sampling technique to get nine villages that were used for the study. In each of the nine villages, 204 members of social clubs were used for the study (Appendix B).

Instrument for Data Collection

The main instrument that was used for data collection was Nutrition knowledge and attitude Questionnaire (NKAQ). The instrument was developed by the researcher following review of related literature. The close ended instrument was in three sections (A, B and C). Section “A” contained three questions on personal data of the respondents, (i.e age, level of education and occupation). Section “B” contained twenty five (25) questions on Nutritional Knowledge Test and consisted of multiple choice and true or false questions. Section “C” on the other hand consisted of twenty (20) questions on Nutrition Attitude Questions with four-point response options of Strongly Agreed, Agreed, Disagreed and Strongly Disagree (Appendix C).

Validation of the Instrument

Content and face validity of the instruments were established with the help of three experts from the Department of Human Kinetics and Health Education and one from the Department of Educational Foundation with emphasis on Measurement and Evaluation, all

from Nnamdi Azikiwe University, Awka. The validators examined the contents of the questionnaire items, their level of clarity, appropriateness of the language used and ability of the instrument to elicit adequate information in relation to the purpose of the study, research questions and hypotheses. The validators suggestions were put into consideration in the production of the final draft of the instrument. The critical draft and the suggestions of the jury are presented in the Appendices (A B and C).

Reliability of the Instrument

The test items of the NKATQ were assessed for reliability using thirty (30) rural women from Umuoji in Idemili North L.G.A. These women were not part of the study population. However they were used for reliability because they shared similar characteristics with the women that were used for this study in Idemili South L.G.A. The instrument was administered to the respondents by the researcher and research assistants on face-to-face basis and collected on the spot.

The data collected from the women's responses to the items of the instrument were used to determine the reliability of the instruments. The reliability of the items on section B of the knowledge test was established using Kuder Richard (K – R20) method. This gave a reliability value of = 0.93; On the other hand, Cronbach Alpha's internal consistency measure was used to establish the reliability of the attitude questions on a four-point scale of SA, A, D and SD. This gave a value of = 0.63 and this signifies a large degree of intra-item coherence in interpretations and answers by the respondents. Hence the instrument was considered reliable.

Intervention Procedure

After collecting the pre-test data, the rural women were exposed to six sessions (one session each week) of health teaching on various aspects of nutrition education. The researcher and research assistants carried out weekly visit to the designated villages. Each

group of rural women was visited every week to continue with the exercise which lasted for not more than two hours per day. Altogether the lessons lasted for a total period of six (6) weeks.

Women who failed to attend up to 75 percent of the teaching sessions were assumed to have suffered from experimental mortality and therefore did not participate in the post test evaluation. Out of the 220 women who were enrolled for the study, only 204 qualified for the post test evaluation.

Control of Extraneous Variables

The following measures were taken to control extraneous variables that were likely to affect the results of the experiment.

- a. Training of research assistants was carried out by the researcher. This was so designed to ensure that the trainees had the same training exposure, which would eliminate bias that could arise from trainers' personality.
- b. To avoid experimental bias and to maintain homogeneity of instruction the training of the research assistants was done by the researcher and the use of a common lesson plan which was provided by the researcher.
- c. Effects of pre-test on post-test were minimized by making sure that the time between them was not too short. However time for post-test was not too long after treatment to avoid forgetting what they had learned.
- d. The pre-test items were reshuffled and renumbered before use for post test. So that they will not get the same answer.

Method of Data Collection

A letter of introduction was collected from the HOD to allow the researcher entry into the villages for data collection. Permission to conduct the study was requested for and

obtained from the President General of the town on presentation of the letter. Verbal consent was obtained from the women leaders. Arrangements were made with the various heads of the women groups. The women were informed about the purpose of the programme and their consent to participate in the exercise obtained.

Training of Research Assistants: - Nine women from Urban Girls Secondary School, Fegge-Onitsha were recruited to assist in the teaching of the women. All attended the Training of Trainers (TOT) workshop. This workshop was organized by the researcher at Ojoto Health Centre. Handouts were made available to them during the training, so as to ensure that the knowledge they imparted was adequate and uniform. The instrument was administered for the pre-test by the researcher and research assistants in the nine selected villages in the three selected towns on face to face basis. The illiterate respondents were asked to complete the questionnaire by verbally responding to questions in the presence of the researcher/research assistants.

At the end of the teaching programme copies of the same questionnaire were served to the participants. This time, however, the items were reshuffled, and administered to the subjects in the groups by the researcher and research assistants. So that they will not get the same answer.

Method of Data Analysis

The generated data were collated and analyzed using Statistical Package for Social Sciences (SPSS) version 15. Means were used to answer the research questions. The differences between the pre-test mean and the post-test means were regarded as the mean difference scores. That were used to answer these research question. The hypotheses were tested at 0.05 level of significance using t-test for hypotheses 1 and 5 and ANOVA for hypotheses 2, 3, 4, 6, 7 and 8.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

This chapter presents the analyses of data generated from the study according to research questions and hypotheses. The summary of major findings of the study are also presented

Research Question One:

What is the effect of nutrition education on the nutritional knowledge score of rural women in Idemili South LGA after nutrition education? Data in Table 1 were used to answer this research question

Table 1: Mean Difference of Nutritional Knowledge Scores of the Subjects after Nutrition Education (N=204)

STUDY GROUPS	N	\bar{X} Score	SD.	Difference Mean Score
Pre-Test	204	61.65	16.55	
Post-Test	204	71.43	14.71	9.78

The data above showed the mean difference of nutritional knowledge scores of the subjects after nutrition education. The findings of the study showed that the post test nutritional knowledge mean score of the subjects was better than their knowledge before instruction by a difference of mean score of 9.78.

Research Question Two:

What is the effect of nutrition education on the nutritional knowledge scores of rural women of different age groups in Idemili South LGA after nutrition education?

Data in Table 2 were used to answer this research question.

Table 2: Mean Difference Nutritional Knowledge Scores of the Subjects According to Their Ages (N = 204)

AGE GROUP	N	PRE-TEST \bar{X} Score	POST-TEST \bar{X} Score	Difference in \bar{X} Score	% Mean Difference
18-23	48	60.00	69.15	9.15	15.3
24-29	44	63.75	73.14	9.48	14.9
30-35	49	56.33	67.35	11.02	19.6
36-41	44	60.86	70.91	10.05	16.5
42 +	19	76.53	85.00	8.47	11.1

Data in Table 2 showed that subjects aged between 30-35 years recorded the highest mean difference scores of 11.02, (% mean difference scores of = 19.6), followed by those within the 36-41 years who had a mean gain score of 10.05, which was 16.5 per cent increase. Those aged 42 years and above had the lowest difference mean scores of 8.47, which showed 11.1 per cent increase.

Research Question Three:

What is the mean effect of nutrition education on the nutritional knowledge scores of rural women of different levels of education in Idemili South LGA after nutrition education?

Data in Table 3 were used to answer this research question.

Table 3: Mean Difference Nutritional Knowledge Scores of the Subjects According to Their Level of Education (N = 204)

LEVEL OF EDUCATION	N	PRE-TEST \bar{x} Score	POST-TEST \bar{x} Score	Difference in \bar{x} Score	% \bar{x} Difference Score
Primary	46	47.67	58.15	10.48	22.0
Secondary	109	57.18	67.50	10.32	18.0
Tertiary	49	84.71	92.63	7.92	9.3

The results of the study in Table 3 showed that subjects with primary education gained higher mean nutritional knowledge scores, (10.48), which was 22 per cent increase, than those with secondary education, (\bar{x} =10.32), and university education, (\bar{x} =7.92), which were 18 per cent and 9 per cent increase respectively.

Research Question Four:

What is the effect of nutrition education on the nutritional knowledge scores of rural women of different occupations in Idemili South LGA after nutrition education? Data in Table 4 were used to answer this research question.

Table 4: Mean Difference of Nutritional Knowledge Scores of the Subjects According to Their Occupation

Occupation	N	PRE-TEST \bar{X} Score	POST-TEST \bar{X} Score	Difference in \bar{X} Score	% \bar{X} Difference Score
Trading	67	61.69	71.45	9.79	16.0
Farming	44	54.50	65.77	11.27	20.7
House wife	53	55.68	65.17	9.49	17
Public Servant	40	77.38	85.88	8.50	11

Table 4 showed that respondents who were farmers gained better nutritional knowledge with mean difference of knowledge scores of 11.27, (20.7 % increase); followed by traders, (\bar{x} = 9.79), which was 16 per cent increase. Mothers who were public servants recorded the lowest mean difference of nutritional knowledge score of 8.50, (i.e 11% increase).

Research Question Five:

What is the effect of nutrition education on the nutritional attitude scores of rural women in Idemili South LGA after nutrition education? Data in Table 5 were used to answer this research question.

Table 5: Mean Difference of Nutritional Attitude Scores of the Subjects after Nutrition Education

STUDY GROUPS	N	\bar{X}	SD	Difference in \bar{X} Score
Pre-Test	204	61.21	11.13	
Post test	204	71.89	10.47	10.68

The fifth research question attempted to find the changes in the attitudes of the subjects with respect to nutrition, before and after nutrition education. The findings of the study showed that the post test nutritional attitude mean scores of the subjects was better than their attitude mean scores before instruction by a difference of mean difference score of 10.68.

Research Question Six:

What is the effect of nutrition education on the nutritional attitude scores of rural women of different age groups in Idemili South LGA after nutrition education? Data in Table 6 were used to answer this research question.

Table 6: Mean Difference of Nutritional Attitude Scores of the Subjects According to Their Ages

AGE GROUP	N	PRE-TEST \bar{X} Score	POST-TEST \bar{X} Score	Difference in \bar{X} Score	% Mean Difference Score
18-23	48	61.33	71.52	10.19	16.6
24-29	44	61.20	71.61	10.41	17.0
30-35	49	57.69	68.98	11.29	19.6
36-41	44	59.61	70.89	11.27	18.9
42 +	19	73.68	83.26	9.58	13

When the subjects' attitudes were analyzed according to their ages, the result showed that subjects who fell within 30-35 years age group recorded the highest mean difference of nutritional attitude scores, (11.29), closely followed by those aged 36-41 years of age, (\bar{x} =11.27). This represented 19.6 percent and 18.9 percent increase respectively. Subjects who were 42 years and above had the lowest score, (\bar{x} = 9.58) which was 13 per cent.

Research Question Seven:

What is the effect of nutrition education on nutritional attitude scores of rural women of different levels of education in Idemili South LGA after nutrition education? Data in Table 7 were used to answer this research question.

Table 7: Mean Difference of Nutritional Attitude Scores of Subjects According to Their Level of Education

LEVEL OF EDUCATION	N	PRE-TEST \bar{X} Score	POST-TEST \bar{X} Score	Difference in \bar{X} Score	% \bar{X} Difference Score
Primary	46	55.37	65.20	9.80	13.9
Secondary	109	57.57	68.72	11.16	19.4
Tertiary	49	74.80	85.20	10.41	17.7

The findings in Table 7 reveal that respondents who held secondary school certificate had a higher mean difference of nutritional attitude score of 11.16, (19.4% increase), followed by those with tertiary education, (\bar{x} =10.41) which represents 17.7 per cent increase. Those with primary education recorded the lowest mean attitude scores of 9.80, (i.e 13.9).

Research Question Eight:

What is the effect of nutrition education on the nutritional attitude scores of rural women of different occupations in Idemili South LGA after nutrition education? Data in Table 8 were used to answer this research question.

Table 8: Mean Difference of Nutritional Attitude Scores of the Subjects According to Their Occupation

Occupation	N	PRE-TEST \bar{X} Score	POST-TEST \bar{X} Score	Difference in \bar{X} Score	% \bar{X} Difference Score
Trading	67	61.31	72.21	10.90	17.8
farming	44	56.50	67.16	10.66	18.9
House wife	53	57.11	68.30	11.19	19.6
Public Servant	40	71.65	81.30	9.65	13.5

The results of the study in Table 8 showed that house wives had mean difference of nutritional attitude score of 11.19, (19.6 percent increase), followed by traders, ($\bar{x}=10.90$) and farmers, ($\bar{x}=10.66$) which were 17.8 and 18.9 per cent increase respectively. Public servants recorded the lowest mean attitude score of 9.65, which was 13.5 per cent increase.

Presentation of Results According to Hypotheses

Hypothesis One:

There is no significant difference in the mean nutritional knowledge scores of rural women in idemili South Local Government Area of Anambra State before and after nutrition education. Data in Table 9 below were used to test this hypothesis.

Table 9: Summary of t-test Analysis of Nutritional Knowledge Mean Scores of the Subjects Before and After Nutrition Education. (N=204)

STUDY GROUPS	N	\bar{X}	SD	DF	t- VALUE	P-VALUE	Decision
Pre-Test	204	61.65	16.55				
				406	6.31	0.0001	Rejected
Post-Test	204	71.43	14.71				

P<0.05 Significant

Table 9 showed the t-test summary of the subjects' difference scores before and after instruction. The figures in the Table showed that the t-value was 6.31 while the p-value was 0.0001. The Independent sample t-test therefore indicated significant difference ($p<0.001$) in mean difference of nutritional knowledge score of the subjects before and after intervention. The mean difference of nutritional knowledge score after the instruction, (71.43) was significantly higher compared to their knowledge before intervention, ($\bar{x}=61.65$). Hypothesis 1 was therefore rejected.

Hypothesis Two:

There is no significant difference in the mean difference of nutritional knowledge scores of rural women of different age groups in Idemili South Local Government Area of Anambra State after nutrition education. Data in Table 10 below were used to test this hypothesis.

Table 10: Summary of ANOVA Analysis of Mean Difference of Nutritional Knowledge Scores of the Subjects According to Their Age Groups

Sources of Variation	Sum of Squares	\bar{X} Square	DF	F-Cal	P-Value	Decision
B/w Grps.	137.04	34.26	4	2.52	.043	Rejected
W/t Grps.	2706.04	13.60	199			
Total	2843.08		203			

P < 0.05 Significant

The figures in Table 10 above showed the ANOVA summary of the analysis of data done to test this hypothesis. The result showed that the F-calculated value for the age differences of the mothers in relation to the mean difference in their nutritional knowledge was 2.52 with 4 and 199 degrees of freedom and with a p-value of 0.043. The ANOVA analysis therefore indicated a significant difference ($P < 0.05$) in the mean difference in their nutritional knowledge score of the subjects of different age groups. The hypothesis was therefore rejected. Furthermore, a post hoc multiple comparison (*Scheffe* test) analysis was carried out to determine where the significant differences lied; and the data in Table 11 below presents the comparison.

Table 11: Post-Hoc Multiple Comparison Test of Mean Difference of Nutritional Knowledge Scores of the Subjects Based on Their Ages

Age of Subjects	P-Value
18-23 years vs. 24-29 years	.999
30-35 years	.185
36-41 years	.850
42 years and above	.978
24-29 years vs. 18-23 years	.999
30-35 years	.340
36-41 years	.951
42 years and above	.936
30-35 years vs. 18-23 years	.185
24-29 years	.340
36-41 years	.805
42 years and above	.167
36-41 years vs. 18-23 years	.850
24-29 years	.951
30-35 years	.805
42 years and above	.661
42 yrs & above vs. 18-23 years	.978
24-29 years	.936
30-35 years	.167
36-41 years	.661

The results in Table 11 indicated where the significant differences amongst the various age groups lied between 30 – 35yrs vs 18 – 23 years.

Hypothesis Three:

There is no significant difference in the mean difference in nutritional knowledge scores of rural women of different levels of education in Idemili South Local Government Area of Anambra State after nutrition education. The figures in Table 12 below show the ANOVA summary of the analysis of data done to test this hypothesis.

Table 12: Summary of ANOVA Analysis of Mean Difference in Nutritional Knowledge Scores of the Subjects According to Their Levels of Education

Sources of Variation	Sum of Squares	Mean Square	DF	F-Cal	P-Value	Decision
B/w Grps.	224.16	112.08	2	8.60	0.001	Rejected
W/t Grps.	2618.91	13.03	201			
Total	2843.07		203			

The result in Table 12 showed that the F-calculated value for the differences in the level of education of the subjects in relation to the mean difference of their nutritional knowledge was 8.60 with 2/20 degrees of freedom and with a p-value of <0.001. The ANOVA test indicated significant difference (p<0.001) in the mean difference of their nutritional knowledge score of the respondents of different levels of education. The hypothesis was therefore rejected. Furthermore, a post hoc multiple comparison (*Scheffe* test) analysis was carried out to determine where the significant differences lie; and the data in Table 13 below present the comparison.

Table 13: Post-Hoc Multiple Comparison Test of Mean Difference in Nutritional Knowledge Scores of the Subjects Based on Their Level of Education

Level of Education	P-value
Primary vs. Secondary	.970
Primary vs. Tertiary	.003*
Secondary vs. Tertiary	.001*

Significant at $P > 0.05$

Scheffe's post hoc comparison test showed that those with secondary education had significantly higher mean difference scores compared with those with tertiary education (p-value = 0.001). Similarly a significant difference was observed in the mean difference of nutritional knowledge of mothers with tertiary education when compared with those score of mothers with primary education, (p-value = 0.003). No significant differences were observed when the other levels of education were compared within them.

Hypothesis Four:

There is no significant difference in the mean difference of nutritional knowledge scores of rural women of different occupations in Idemili South Local Government Area of Anambra State after nutrition education. The figures in Table 13 below show the ANOVA summary of the analysis of data done to test this hypothesis.

Table 14: Summary of ANOVA Analysis of Mean Difference of Nutritional Knowledge Scores of the Subjects According to Their Occupation

Sources of Variation	Sum of Squares	\bar{X} Square	DF	F-Cal	P-Value	Decision
B/w Grps.	168.03	56.01	3			
				4.19	.007	Rejected
W/t Grps.	2675.05	13.38	200			
Total	2843.08		203			

P<0.05

The results in Table 14 showed that the F-calculated value for the various occupations of the subjects in relation to the mean difference of nutritional knowledge was 4.19 with 3/200 degrees of freedom and a p-value of 0.007. The ANOVA analysis therefore indicated a significant difference ($p < 0.05$) in the mean difference of nutritional knowledge score of the rural women with different occupations. The hypothesis is therefore rejected. A post hoc multiple comparison, (*Scheffe* test) analysis was carried out to determine where the significant differences lied; and the data in Table 15 below present the comparison.

Table 15: Post-Hoc Multiple Comparison Test of Mean Difference of Nutritional Knowledge Scores of the Subjects Based on Their Occupation

Occupation	P-value
Trading vs. Farming	.229
Trading vs. House wife	.978
Trading vs. Public Servant	.376
Farming vs. House wife	.130
Farming vs. Public Servant	.008*
House wife vs. Public Servant	.644

*Not significant

The results in Table 15 indicated where the significant differences amongst the various occupational groups lied. The analysis of the data indicated that the difference lied between farmers and public servants, ($p < 0.05$). No significant differences were observed within other occupational groups.

Hypothesis Five

There is no significant difference in the mean nutritional attitudes scores of rural women in Idemili South Local Government Area of Anambra State before and after nutrition education. Data in Table 16 below were used to test this hypothesis.

Table 16: Summary of t-test Analysis of Nutritional Attitude Mean Scores of the Subjects Before and After Nutrition Education (N=204)

STUDY GROUPS	N	\bar{X}	SD	DF	t- VALUE	P-VALUE	Decision
Pre-Test	204	61.21	11.13				
				406	9.98	0.0001	Rejected
Post-Test	204	71.89	10.47				
P<0.05							

The figures in Table 16 above showed that the t-value was 9.98 with p-value of 0.0001. The Independent sample t-test therefore indicated significant difference ($p < 0.001$) in the mean difference of nutritional attitude score of the subjects before and after nutrition education. The mean difference scores before and after nutrition instructions were 61.21 and 71.89 respectively. The hypothesis is therefore rejected.

Hypothesis Six:

There is no significant difference in the mean difference of nutritional attitude scores of rural women of different age groups in Idemili South Local Government Area of Anambra State after nutrition education. The figures in Table 17 show the ANOVA summary of the analysis of data done to test this hypothesis.

Table 17: Summary of ANOVA Analysis of Mean Nutritional Attitude Scores of the Subjects According to Their Age Groups

Sources of Variation	Sum of Squares	\bar{X} Square	DF	F-Cal	P-Value	Decision
B/w Grps.	71.34	17.84	4	1.60	.176	Accepted
W/t Grps.	2219.31	11.15	199			
Total	2280.65		203			

P>0.05

The results in Table 17 showed that the F-calculated value was 1.60 with degrees of freedom 4 and 199 and p-value of 0.176. The ANOVA analysis, therefore indicated no significant difference ($p>0.05$) in the mean difference of nutritional attitude scores of the subjects when analysed according to their various age groups. The hypothesis is therefore accepted.

Hypothesis Seven:

There is no significant difference in the mean difference of nutritional attitude scores of rural women of different levels of education in Idemili South Local Government Area of Anambra State after nutrition education. The figures on Table 18 represent the ANOVA summary of the analysis of data done to test this hypothesis.

18: Summary of ANOVA Analysis of Mean Difference of Nutritional Attitude Scores of the Subjects According to Their Level of Education

Sources of Variation	Sum of Squares	\bar{X} Square	DF	F-Cal	P-Value	Decision
B/w Grps.	61.85	30.93	2	2.79	.064	Accepted
W/t Grps.	2228.79	11.09	201			
Total	2290.64		203			

P>0.05

The results in Table 18 indicated that the F-calculated value was 2.79, with degrees of freedom of 2 and 201 and p-value of 0.064. ANOVA test indicated no significant difference ($p < 0.05$) in the mean difference in their nutritional attitude score of the respondents when analysed according to different levels of education. The hypothesis is therefore accepted.

Hypothesis Eight:

There is no significant difference in the mean difference of nutritional attitude scores of rural women of different occupations in Idemili South Local Government Area of Anambra State after nutrition education. The figures in Table 18 represent the ANOVA summary of the analysis of data done to test this hypothesis.

Table 19: Summary of ANOVA Analysis of Mean Difference of Nutritional Attitude Scores of the Subjects According to their Occupation

Sources of Variation	Sum of Squares	Mean Square	DF	F-Cal	P-Value	Decision
B/w Grps.	59.28	19.76	3	1.77	.154	Accepted
W/t Grps.	2231.37	11.16	200			
Total	2290.65		203			

The results in Table 19 indicate that the F-calculated value was 1.77 with 3 and 200 degrees of freedom and p-value of 0.154. ANOVA analysis indicates no significant difference ($p > 0.05$) in the mean difference of nutritional attitude score of the subjects of different occupations. Hypothesis is therefore accepted

Summary of Major findings

1. The subjects after nutrition education recorded a higher mean difference of nutritional knowledge score ($\bar{x}=71.43$) than before intervention ($\bar{x}=61.65$), Table 1.
2. Subjects whose ages ranged from 30-35 and 36-41 years gained higher nutritional knowledge mean difference scored ($\bar{x}=11.02$ and $\bar{x}=10.05$ respectively) after instructions. Those aged 42 years and above gained the least, $\bar{x}=8.47$, (Table 2).
3. Subjects with primary education and secondary education gained higher mean nutritional knowledge score ($\bar{x}=10.48$ and 10.32 respectively), after instructions, (Table 3).
4. Subjects who were farmers gained better nutritional knowledge with mean difference score of 11.27; followed by traders, ($\bar{x}= 9.79$), housewives ($\bar{x}= 9.49$), and public servants, ($\bar{x}= 8.50$), (Table 4).

5. Subjects recorded a mean difference of nutritional attitude scores of 71.89 after nutrition education. Their mean difference of nutritional attitude scores before instructions was 61.21, (Table 5).
6. There was slight variation in the mean difference of nutritional attitude scores of the rural women with respect to their ages after the instructions. Subjects in the 30-35 age bracket had the highest mean scores of 11.29, followed by those aged 36-41, (\bar{x} =11.27), Table 6.
7. Mothers who had secondary and tertiary education had a higher mean difference of nutritional attitude score of 11.16 and 10.41 respectively, when compared with their primary school counterparts who scored a mean difference of nutritional attitude scores of 9.8, (Table 7).
8. Subjects who were housewives had the highest mean difference of nutritional attitude scores of 11.19, followed by traders, (\bar{x} =10.90), (Table 8).
9. There was a significant difference ($p<0.05$) in the mean difference in their nutritional knowledge scores of the respondents before and after nutrition education. The mean difference scores after instructions was significantly higher, (71.43) when compared with their mean difference scored before nutrition education, (\bar{x} =61.65), (Table 9).
10. There was a significant difference ($p<0.05$) in the mean difference of nutritional knowledge scores of the subjects of different age groups (Table 10).
11. There was a significant difference ($p<0.05$) in the mean difference of nutritional knowledge scores of the subjects when compared with their different levels of education (Table 12).
12. There was a significant difference ($p<0.05$) in the mean difference of nutritional knowledge scores of the subjects when analyzed according to occupation (14).
13. There was a significant difference ($p<0.05$) in the mean difference of nutritional attitude scores of subjects before and after nutrition education. The mean difference

scores after nutrition instructions was significantly higher, ($\bar{x}=71.89$), as compared to the mean scores before intervention, ($\bar{x}=61.21$), in Table 16.

14. There was no significant difference ($p>0.05$) in the mean difference of nutritional attitude scores of the subjects of different age groups (Table 17).
15. There was no significant difference ($p>0.05$) in the mean difference of nutritional attitude scores of the rural women of different levels of education, (Table 18).
16. There was no significant difference ($p>0.05$) in the mean difference of nutritional attitude scores of the rural women when analyzed according to occupation, (Table 19).

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

In this chapter the major findings of the study are discussed in relation to the stated research questions and hypotheses. Discussion of the findings of the study is presented under the following sub headings:

- Effects of nutrition education programme on nutritional knowledge of the subjects
- Effects of nutrition education programme on nutritional attitudes of the subjects

The overall conclusion drawn from the findings, recommendations, implications of the study and suggestions for further research are also presented.

Effects of nutrition education programme on nutritional knowledge of the subjects:

The findings of the study showed that the post test nutritional knowledge mean score of the subjects was higher than their pre-test knowledge mean score by a difference of mean difference score of 9.78%. The independent sample t-test statistic carried out showed that this difference was significant, ($P < 0.001$). This result was expected because of the level of nutrition education the subjects were exposed to.

The findings of the study is in consonance with those documented by Anetor, Ogundele and Oyewole, (2012); Audu, (2013); Gupta and Kochar, (2008); Jaffer et al (2009); Maria Wijaya-Erhardt, Siti Muslimatun and Juergen Erhardt, (2013); Moore, Pawloski, Rodriguez, Lumbi and Ailing (2009); Norma, Jan, Ann, Jean and Phillip, (1997); Nyakuru (2009); Oosthuizen, (2010); Ozier and Josephine, (2010); Sule, et al (2009); Walsh, Dannhauser, and Joubert (2009) who observed that there was improvement in knowledge and increase in good nutrition practice after educational interventions.

Furthermore, a similar study on the effect of nutrition education programme on food-related-knowledge and attitudes of the subjects, in Pankshin Community, Nigeria by Audu, (2013) is also in consonance with this present study. The result revealed a significantly higher

increase in knowledge, attitude and practice of the subjects after nutrition education intervention. These results suggest that nutrition education sessions can promote an improvement in the nutritional knowledge of the subjects.

In addition, the study also examined the moderator variables of age, level of education and occupation. With respect to age, the findings of this study seem to suggest that the subjects between 30 - 35 and 36 - 41 years age brackets acquired better nutrition knowledge than other age groups, (mean difference of 11.02 with percentage increase of 19.65% and 10.05% with percentage increase of 16.5 respectively). The knowledge dropped significantly among those aged 42 years and above, with mean difference scores of 8.47 and percentage increase of 11.47. This finding is not surprising, since women in these age groups are expected to be more active in taking greater responsibility and decisions concerning family nutrition, and are therefore more likely than other women to gain better nutrition knowledge. The reason for the drop in mean difference knowledge score of mothers above 42 years of age may be because at that age they now have grown up children that are more actively involved in family nutrition. They may therefore begin to lose interest in matters concerning nutrition education programmes.

This finding is in agreement with that documented by Siegel and Fawcett (2005) who examined the effect of nutritional education on nutrition knowledge. and suggested that the knowledge gain differed remarkably by age. The study also revealed that younger women had lower pretest knowledge and higher post test knowledge. This fact is that the pre-test knowledge is higher showing that the already know about nutrition is older women so the mean difference is expected and the younger women might be paying more attention to issues concerning nutrition, read more about nutrition and discuss more about nutrition. Interestingly, this finding is in agreement with that documented by Agu, (2013), who examined the effects of teaching contraceptive use on the health knowledge and attitudes of

post partum multiparous mothers in Anambra State, and observed that mothers whose ages were above 41 years gained lower health knowledge as compared to mean gain scores of mothers in younger age groups. This association was, however, not statistically significant, ($P>0.05$).

With respect to the mothers' level of education, the results of the study showed that as the subjects level of education increased their ability to acquire, retain and be able to use nutrition knowledge diminished gradually. Mothers with tertiary education gained lowest nutrition knowledge, (mean difference of score, 7.92, representing 9.3% increase) as compared to mean difference scores of 10.32, showing increase, and 10.48, showing 22% increase among mothers with secondary and primary education, respectively. This difference, however, was not statistically significant. This result is surprising, because ordinarily, it would have been expected that those with tertiary education would have a significantly higher mean difference scores compared to others. Female education has been seen as a key determinant of nutritional knowledge and attitude (National Population Commission, 2004). Better educated women seem to be more willing to engage in innovative behaviour than the less educated women. Better educated women are also seen to be more willing to have more knowledge of nutrition than less educated women because of their literacy, greater familiarity with modern institutions and a greater likelihood of rejecting a fatalistic attitude towards life. There is good evidence that for whatever reason, women's education indeed promotes knowledge and attitude of nutrition in most communities (Gillespie & Mason, 2003).

The reason attributable to this unusual phenomenon in this present study could be that this group of mothers, who had tertiary education, took the teaching sessions for granted and they already knows everything about nutrition and a such did not show enough seriousness.

This result, however, is at variance with the findings of a study documented by Rose, Penny and Irene (2008) which showed significant differences in nutrition knowledge by educational level, with those with tertiary education backgrounds having higher scores than other groups. Similarly, the results of a study of young children's mothers on infant feeding in rural areas by Jaffer, Afifi and Alouhishi (2009), showed that educational background had significant effect on knowledge attitude and practice (KAP) scores: KAP scores of the mothers with primary education or less (8.3+/-2.2) were significantly lower than that of the mothers educated with high school (9.4 +/-1.6) and university (9.6 +/-1.8) (LSD $t = 3.70$, $P < 0.001$). Ayesha Mohannad et al (2012) in their study to determine the association of maternal education, gestational age, parity and socioeconomic status with nutritional knowledge and subsequent practice regarding iron rich foods and iron supplements also confirmed that a significant relationship ($p < 0.001$) was observed between nutritional awareness and educational status of the respondents.

When the effects of nutrition education was further analyzed according to occupation, the result of the study in Table 4 showed that respondents who are farmers gained better nutritional knowledge with mean difference in their knowledge score of 11.27, followed by traders (mean difference scores, 9.79%). Mothers who were house wives had higher mean difference knowledge scores of 9.49, while mothers who were public servants recorded the lowest mean difference in their nutritional knowledge score (8.50%). Again, this result was surprising, since it was expected that public servants, who scored higher in the pre-test should score higher in the percentage mean score but it was not so. This is in line with the assertion by World Health Organization (2005) which stated that employment and working conditions greatly affect health and involvement in health activities. This is because daily activities of women affect their interest in nutrition programme. These findings again are at variance with the result of the study by Rose, Penny and Irene (2008), which demonstrated

significant differences in nutrition knowledge when analyzed according to occupation, with those with professional occupations having higher scores than other groups. In conclusion, the analysis of the results show that nutrition education improved knowledge of nutrition in the participants. The subjects displayed higher nutrition knowledge after instructions on nutrition.

Effects of nutrition education programme on nutritional attitude of the subjects.

The result of the study showed that nutrition education improved nutrition attitude of the participants. The subjects after the educational intervention displayed higher mean gain attitude score compared to their attitude before nutrition instruction, (Table 5). The mean gain attitude score was 10.68%. The independent sample t-test carried out indicated significant difference ($P < 0.001$) in the mean gain attitude score of the subjects before and after nutrition education. This result was expected because of the level of nutrition education the subjects were exposed to, since evidence seems to suggest that knowledge influences attitude, (Jaffer, Afifi and Alouhishi, 2009).

The findings of most researchers are in agreement with the results of this present study. Auduin (2013) investigated the effect of nutrition education programme on food-related-knowledge and attitudes of literate women in Pankshin community. The findings of the study showed that there was statistical significant difference between the mean gain attitude scores of the women exposed to nutrition education programme (NEP) and those not exposed to NEP. This finding reinforces the suggestion that knowledge influences attitude as documented by Jaffer, Afifi and Alouhishi, (2009),

Similarly, the findings of this study corroborates a research carried out by Dulce (2005) to assess the effect of a nutrition education module on the knowledge, attitude and practices of mothers with undernourished children aged 0 – 5 years old on nutrition in Barangay Biayon, Sergio Osmeña Sr., Zamboanga del Norte. The result showed that the

respondents' attitude on nutrition before the intervention was under the positive spectrum. Using the paired t-test, the mean attitude scores increased after the intervention, implying that the attitudes were strengthened but not significant statistically.

In addition a research by Shaaban, Nassar, Shatla, Deifallah, Marzouk and Abogabal, (2012), designed to assess the changes in knowledge, attitude and practice (KAP) of preschool teachers before and after 3 months of attending a nutrition education intervention programme is in agreement with the present study. The result showed that all the enrolled teachers showed significant increase in KAP scores after attending the nutrition education sessions ($P < .001$ for all the KAPs).

Ironically, the findings of a study to determine the effect of nutrition instruction among students enrolled in secondary level health courses by Byrd-Bredbenner, O'Connell, Shannon and Eddy, (1985) seem to contradict the result of the present study. The results indicate that, even though all grade levels in the experimental group had significantly improved knowledge scores, little change in attitude scale scores was noted in grades seven and eight after intervention. The age of the subjects could have accounted for the contradiction in this study. Young students may not consider issues of nutrition seriously, since they do not have any decision making roles at home concerning family nutrition.

Just like with knowledge, the study also examined the moderator variables of age, level of education and occupation in terms of their individual associations with nutrition attitudes, which is the dependent variable. When the mean gain nutritional attitude scores of the subjects were considered according to age, the ANOVA analysis of the result indicated a significant difference ($p < 0.05$). Table 6 showed that those aged 30-35 years recorded highest mean gain attitude score of 11.29, which was 19.6 percent gain in attitude score, closely followed by those aged 36-41, (mean difference attitude score, 11.27 i.e 18.9% increase). Those who were 42 years and above scored lowest, i.e 9.58, which was 13% increase. This

was also the pattern observed when the mean difference of nutritional knowledge scores of the subjects were analyzed according to age. These age groups who recorded the highest nutritional mean difference knowledge score also had the highest mean difference attitude score, suggesting that there was a relationship between knowledge and attitude. The reason for the drop in mean difference attitude score just like the drop in knowledge score of mothers above 42 years of age, may be because at that age they now have grown up children that are more actively involved in family nutrition. They may therefore begin to lose interest in matters concerning nutrition education programmes.

The study by Audu, (2013) which investigated the effect of nutrition education programme on food-related-knowledge and attitudes of literate women in Pankshin community found that as people grows they feel that they love known everything and no need to waste their time. The result showed that age has no significant influence on the nutritional attitudes of the women. Sample size, however may be a factor in the inconsistencies observed in these various studies.

When analyzed according to education, the result of the study in Table 7 showed that level of education influenced the subjects' attitude towards nutrition education. Interestingly, it was the subjects who have secondary school certificate that had a higher mean difference of attitude score of 11.16, (which is 19.4 percent increase), and closely followed by those with tertiary education (mean difference scores, 10.41, with percentage increase score of 13.9). Those with primary education had a mean attitude score of 9.80, (17.7%). The ANOVA analysis indicated a significant difference ($P < 0.05$) in the mean difference attitude score of the rural women of different levels of education. This result again is surprising since educated mothers (those who attended tertiary institution), who have easier access to information, would have been expected to record higher mean difference attitude score, than women from other educational levels. The explanation lied largely in the influence exerted by social

pressure from job and other social activities by this group of women, which also affected their overall mean nutrition knowledge score.

Ali, Layla, Fouad, Sadeq, and Saif, (2011) in their study investigated the dietary intakes of Omani preschoolers and associations with both socio-demographic characteristics and the mother's nutritional knowledge and attitudes. The results showed the highest food intake and healthy eating attitude scores were found in children of mothers with high education level.

On the other hand the result of the study on the effect of nutrition education programme on food-related-knowledge and attitudes of literate women in Pankshin community by Auduin (2013), seem to suggest that level of education has no significant influence on the nutritional attitudes of the women.

Again, when the data were analyzed according to occupation, the result in Table 8 did not show any significant changes in the mean difference attitude score of the mothers. The house wives had mean difference attitude score of 11.19, (19.6%) followed by traders, 10.90, (17.8%); and farmers 10.66, (18.9%) respectively. Public servants recorded the lowest mean attitude score of 9.65, which is 13.5 percent increase. The highest increase in attitude difference scores observed among house wives, (even though not significant), could be because since they were not engaged in any other occupation, they were therefore more devoted to cooking and issues concerning nutrition. This could influence their attitude positively towards nutrition.

Conclusion

Findings from this study highlighted the effects of community based nutrition education programme on nutritional knowledge and attitudes of rural women in Idemili South L.G.A. Post test mean gain nutrition knowledge scores and post test mean gain attitude scores

of mothers were found to be significantly higher than the pretest mean difference knowledge and attitude scores.

Mothers whose ages were within 30-35 and 36-41 years age brackets and those with primary education gained higher mean nutrition knowledge scores than secondary and tertiary education. In addition, subjects who were farmers gained better nutritional knowledge than mothers in other occupational groups such as Trading, Housewife and Public Servant.

The result of the study also suggested that age, level of education and occupation did not necessarily influence mothers' attitude towards nutrition education. Just like with knowledge, mothers whose ages were within 30-35 and 36-41 years age brackets, and those with secondary education, gained higher mean nutrition attitude scores more than primary and tertiary education. The differences, however, were not statistically significant. It implies that level of education influences knowledge of nutrition but attitudes towards it was not encouraging.

Implications of the Study

The results of this study showed that mothers whose ages were within 30-35 and 36-41 years age brackets gained higher mean health knowledge scores more than their counterparts in the other age ranges. This implies that this group of mothers has the desire to gain nutrition knowledge needed to keep their family healthy. Educational efforts, therefore, should be targeted at mothers of rural areas. Mothers of urban areas, however, should also not be neglected. Other appropriate teaching methods should be explored to assess the efficacy of the programme. Nutrition education programmes can therefore be employed as a veritable method of addressing the low problem nutrition knowledge and attitude of rural women in Anambra State

Again, subjects with primary education in this study were shown to have gained higher mean health knowledge scores more than secondary school , including mothers with tertiary education. Who recorded the lowest mean difference in their attitude score when

compared with primary and secondary school. The implication is obvious. It implies that level of education influences knowledge of nutrition but attitude towards it was not encouraging. However, other appropriate strategies should be explored, geared towards increasing the mean gain attitude score of the group of subjects, which will be commensurate with their recorded knowledge gain.

Recommendations

A number of recommendations that arose from this study are stated below: -

1. There is the need to include nutrition education programmes in the women meetings, and other women gatherings in Nigeria. This is intended to expose women to accurate nutrition information which will improve their nutrition knowledge, as well as aid them in developing positive attitudes towards nutrition.
2. The environment for Nutrition education programmes should be made as informal as possible to eliminate what looks like student-teacher relationship as found in formal learning environment, to enable the women express themselves freely and thereby learn more.
3. All women attending nutrition education programme should be provided with educational leaflets/information on nutrition education or asked relevant questions to help improve their knowledge and attitudes towards nutrition.
4. Mass media campaigns on nutrition education programme should be used and complemented with other methods that have been found to be efficacious in influencing knowledge and attitudes. Teaching/counseling on nutrition education should be advocated in rural areas since it has been proved to be very efficacious.
5. The study has proved that less educated mothers have the potentials to acquire knowledge as well as acquire positive attitudes about nutrition, if communicated in the language they can understand. Efforts, therefore, should be made to design

appropriate health education packages that can meet the needs of this group of less educated mothers.

6. Community health educators can work with the target group in the community setting. Health personnel can work with the mothers directly through giving of talks during their meetings.

Suggestions for further Study

1. A more elaborate research should be undertaken to cover a wider geographical area of Anambra State, in order to incorporate more research samples. This will provide a more generalizable result.
2. Predictors of nutritional knowledge, attitudes and practices should also be investigated for comparative purposes.
3. Effect of community based nutrition education on nutritional knowledge and attitudes of rural adolescent in Anambra State should be studied.

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APPENDIX A

Towns in Idemili South L.G.A, selected towns and villages.

Table A: Towns in Idemili South L.G.A

1. Alor
2. Akwa Ukwu
3. Awka-Etiti
4. Nnobi
5. Nnokwa
6. Oba
7. Ojoto

B Towns Selected:

Awka-Etiti

Oba

Ojoto

C. Villages selected

Awka-Etiti	Oba	Ojoto
Umudunu *	Urueze	Ire
Nkwuruohia	Aboji *	Ezieke
Umunaocha *	Isu	Ojo
Iru Owerri	Umuogali *	Umuche
Oga Nzele *	Ezele	Umuezema *
Nneaba	Ogwugwu *	Ezema *
Ejegenadu	Abaeme	Enugo *
	Ogboewe	Ndiaboh
	Okuzu	

APPENDIX B
SOCIAL CLUBS

AWKA ETITI TOWN

1. Confidence in God social club
2. Fancy ladies social club
3. Umuoma ladies social club

OBA TOWN

1. Otu Ifunanya social club
2. Anyibuofu social club
3. Chibugo social club

OJOTO TOWN

1. Star ladies social club
2. Eziafa social club
3. Express ladies social club

APPENDIX C

Human Kinetics and Health Edu. Dept,
Nnamdi Azikiwe University,
Awka.

Dear Respondent.

I am a Ph.D student of the above named institution interested in finding out the effects of Community Based Nutrition Education Programme on Nutritional Knowledge and Attitudes of Rural women in Idemili South L.G.A. of Anambra State. Could you please respond to the questionnaire. All your responses are purely for research purposes and information supplied shall be treated as confidential. No names are required to be written.

Orajekwe Veronica Ngozi
(Researcher).

NUTRITION EDUCATION KNOWLEDGE TEST (NEKT)

Section A: Bio-social Data

Instruction: (please tick (✓) in the appropriate box that best explain your Bio-social data.

1. Age (Years)

- a. 18 – 23yrs
- b. 24 – 29yrs
- c. 30 – 35yrs
- d. 36 – 41yrs
- e. 42yrs and above

2. What is your level of education?

- a. Primary education
- b. Secondary education
- c. Tertiary education

3. What is your occupation?

- a. Trading
- b. Farming
- c. House wife
- d. Public Servant

SECTION B: NUTRITIONAL KNOWLEDGE TEST

INSTRUCTION: Circle the alphabet that correspond to the correct answer to each question.

1. The main food group that supplies the body with heat and energy are
 - a. Carbohydrates and iron
 - b. Carbohydrates and fats
 - c. Carbohydrates and vegetables
 - d. Protein and iron.

2. Which of the following is a body builder?
 - a. Beans
 - b. Fat
 - c. Roughage
 - d. Yam

3. Which of the following is a deficiency disease?
 - a. Malaria
 - b. Fever
 - c. Aids
 - d. Kwashiorkor

4. Which of the following is very important for proper development of the bones?
 - a. Minerals
 - b. Proteins
 - c. Oils
 - d. Vitamins

5. Which of the following is not a nutrient in a balance diet
 - a. Carbohydrate
 - b. Fats
 - c. Hydrogen
 - d. Water

6. Digestion of food does not take place in the
 - a. Mouth
 - b. Large intestine
 - c. Stomach
 - d. Liver

7. High intake of iron-rich foods during pregnancy prevents
 - a. Kwashiorkor
 - b. Anemia
 - c. Beri-beri
 - d. Pellagra

8. Which of the following is a characteristic of rickets?
 - a. Bleeding gum
 - b. Stunted growth
 - c. Cracked growth
 - d. Knocked Knees

9. Which other mineral, in addition to calcium, is needed to build strong teeth?
- a. Iron
 - b. Copper
 - c. Phosphorous
 - d. Iodine
10. Normally, constipation is best avoided through the use of
- a. Mineral Oil
 - b. Salt
 - c. Protein
 - d. Food containing roughages
11. One of these is important in maintaining good health
- a. Fever
 - b. Exercise
 - c. Working hard
 - d. Eating too much.
12. Over feeding can result to
- a. Diarrhea
 - b. Good health
 - c. Obesity
 - d. Mineral

13. Old people should not be allowed to consume much:
- a. Iron
 - b. Cassava
 - c. Fish
 - d. Corn
14. Food should be preserved through one of the following
- a. Smoking
 - b. Fishing
 - c. Colouring
 - d. Adding alum
15. One way to prevent food borne disease is to:
- a. Keep the fire place or stove burning
 - b. Make food soft and easy to digest
 - c. proper cooking of food before consumption
 - d. Develop flavor and improve its appearance
16. Most people who are overweight are so mainly because of the following except one.
- a. They eat too much fattening high-caloric food
 - b. They eat variety of food
 - c. They have inherited the tendency
 - d. They exercise too little

17. The following factors are considered when buying food except one
- a. Size of the family
 - b. The family food need
 - c. Regulates body temperature
 - d. Money available to the family.

(Please answer true or false in the following questions by ticking (✓) in the blank spaces provided)

18. For one to be healthy he/she must eat balanced diet. True false
19. Attending a nutrition education programme is a waste of time. True false
20. Nutrition knowledge can reduce death caused by malnutrition. True false
21. Drinking much water daily is not good for health. True false
22. The consumption of vegetables is good for one's health. True false
23. Protein Food helps in the growth and repair of body tissue. True false
24. Vitamins cannot help to build bones and tissue True false
25. Children who suffer from Kwashiorkor have normal growth True false

APPENDIX D:

NUTRITION EDUCATION ATTITUDE QUESTIONNAIRE (NEAQ)

Section C: Attitude Towards Nutrition

Instruction: Please indicate your option on the following Nutrition education issues.

1 2 3 4

S/N	ATTITUDINAL STATEMENT	Strongly agreed	Agree	disagree	Strongly disagree
1	Washing fruits and vegetables before eating destroy nutrient in the food.				
2	The family make up should not be considered in the preparation of food.				
3	There is no need to rest after eating.				
4	It is not good to give children egg.				
5	Leftover cooked food can be consumed without warming.				
6	It is not good to buy food stuff where it is best and cheapest.				
7	The nature of food does not matter to the buyer.				
8	It is not good to write a shopping list before buying food ingredients.				
9	Food taboos will not interfere with growth and development in young persons.				
10	Rickets diseases occur to every child.				

11	If you don't feed a baby with breast milk the baby will die.				
12	A woman who feeds well may become a burden to her husband.				
13	A balanced diet is usually very costly				
14	It is not necessary to cover the mouth while cooking.				
15	It is not easy for one to change his eating habits				
16	Men love women who do not cook well				
17	Pregnant women must not eat egg.				
18	Having excess weight reflects good health.				
19	Rural women don't know anything about nutritional practices.				
20.	Eating balanced diet is not necessary.				

APPENDIX E

MARKING SCHEME FOR KNOWLEDGE TEST:

ITEM NO	ANSWER
1	B
2	A
3	D
4	A
5	C
6	D
7	B
8	D
9	A
10	D
11	B
12	C
13	B
14	A
15	C
16	B
17	C
18	TRUE
19	FALSE
20	TRUE
21	FALSE
22	TRUE
23	TRUE
24	FALSE
25	FALSE

APPENDIX F:

RELIABILITY OF THE INSTRUMENT

Section B: Kuder-Richardson 20 (KR₂₀)

$$KR_{20} = \frac{N}{N-1} \left(\frac{V - \sum p_i q_i}{V} \right)$$

Where KR_{20} = Correlation coefficient

N = Number of items

V = Variance of the whole test

p_i = Proportion of people passing the items

q_i = Proportion of people failing the items

ITEM	PASS	FAIL	p_i	q_i	$p_i q_i$
1	13	17	0.43	0.57	0.2451
2	29	1	0.96	0.04	0.0384
3	21	9	0.70	0.30	0.2100
4	11	19	0.36	0.64	0.2304
5	24	6	0.80	0.20	0.1600
6	18	12	0.60	0.40	0.2400
7	12	18	0.40	0.60	0.2400
8	17	17	0.56	0.44	0.2464
9	18	12	0.60	0.40	0.2400
10	23	7	0.76	0.24	0.1824
11	28	2	0.93	0.07	0.0651
12	28	2	0.93	0.07	0.0651
13	25	5	0.83	0.17	0.1411
14	22	8	0.73	0.27	0.1971
15	25	5	0.83	0.17	0.1411
16	4	26	0.13	0.87	0.1131
17	26	4	0.86	0.14	0.1204
18	28	2	0.93	0.07	0.0651
19	27	3	0.90	0.10	0.0900
20	24	6	0.80	0.20	0.1600
21	28	2	0.93	0.07	0.0651
22	29	1	0.96	0.04	0.0384
23	26	4	0.86	0.14	0.1204
24	25	5	0.83	0.17	0.1411
25	24	6	0.80	0.20	0.1600
Total					4.3017

$$\bar{X} = \frac{\sum X}{n} = \frac{555}{25} = 22.2$$

$$V = \frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2 = \frac{13343}{25} - \left(\frac{555}{25}\right)^2 = 533.72 - (22.2)^2 = 40.88$$

$$KR_{20} = \frac{N}{N-1} \left(\frac{V - \sum p_i q_i}{V}\right) = \frac{25}{25-1} \left(\frac{40.88 - 4.3017}{40.88}\right) = \frac{25}{24} (0.89477) = 0.932$$

$$\therefore KR_{20} = 0.93$$

Section C: Cronbach Alpha Coefficient (α)

$$\alpha = \frac{K}{K-1} \left(1 - \frac{\sum V_i}{V_t}\right)$$

Where α = Correlation coefficient

K = Number of items

V_i = Variance of individual items

V_t = Variance of total items

ITEM	SA	A	D	SD	\bar{X}	V_i
1	3	1	4	22	1.50	0.9166
2	1	7	18	4	2.16	0.5010
3	3	6	12	9	2.10	0.8900
4	2	0	12	16	1.60	0.6400
5	21	6	1	1	3.50	0.9166
6	10	6	14	0	2.86	0.8204
7	5	5	11	9	2.20	1.0933
8	0	10	16	4	2.20	0.4266
9	0	3	20	7	1.86	0.3404
10	1	0	19	10	1.73	0.4071
11	1	2	14	13	1.70	0.5433
12	1	3	15	11	1.80	0.5600
13	4	4	18	4	2.26	0.7590
14	2	5	14	9	2.00	0.7333
15	1	6	11	12	1.86	0.7404
16	3	1	8	18	1.63	0.9097
17	4	2	12	12	1.93	1.0084
18	4	0	9	17	1.70	1.0100
19	1	3	16	10	1.83	0.5511
20	5	1	5	19	1.73	1.2737
Total						15.0409

$$V_t = \frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2 = \frac{7505}{80} - \left(\frac{599}{80}\right)^2 = 93.8125 - (7.48)^2 = 37.8621$$

$$\therefore V_t = 37.8621$$

$$\alpha = \frac{20}{20-1} \left(1 - \frac{15.0409}{37.8621}\right) = \frac{20}{19} (1 - 0.3972) = 0.6345$$

$$\therefore \alpha = 0.63$$

The reliability coefficients show that the instrument is reliable and suitable for the study.

APPENDIX G:

LETTER OF PERMISSION TO COLLECT DATA

Department of Human
Kinetics and Health Education
Nnamdi Azikwe University
Awka, Anambra-State
Nigeria.
04/08/2014

Tel: 08039457394

Our Ref:.....

TO WHOM IT MAY CONCERN

RE: ORAJEKWE, VERONICA NGOZI – REG. NO: 2008187003P

The bearer of this note, by name Orajekwe Veronica Ngozi is a Ph.D students of Human Kinetics and Health Education Department, Nnamdi Azikiwe University, Awka. Kindly give her all the necessary assistance she may need in the course of her research work.

Prof. J.O. Okafor

HOD

APPENDIX H:

The Programme

Date	Topic
Day 1	(a). Pre-test - Food/classes/sources (b). Health benefit of food
Day 2	(a). Balanced diet (meaning) (b). How do we get a balanced diet
Day 3	(a). Deficiency disease/food borne disease (b). Deficiency disease in each classes of food (c). Food poisoning/food infection
Day 4	(a). Food Taboos/Healthy feeding Habit (b). Hazards of food taboos (c). Health benefits of Healthy feeding habits
Day 5	(a). Food hygiene-preparation (b). healthy rules for food Hygiene (c). Food preservation
Day 6	(a). Economic buying of healthful food stuff (b). Factors to consider when buying food (c). Wise buying practices
Day 7	Post-test/Evaluation

APPENDIX I

Teaching Plan For Day One

Subject: Nutrition Education

Topic: Food-Classes/Sources and Health Benefits of Food.

Duration: 2 hours

Specific Objectives

Cognitive Domain:

By the end of the unit, participants will be able to cognitive

- (a) explain the meaning of food
- (b) identify the six classes of food
- (c) mention Sources of each class
- (d) enumerate the health benefit of food

Affective Domain: develop positive attitude towards nutrition education.

Psychomotor Domain: List the major sources of food and health benefits of food.

Entry Behaviour:

- (1) The participants already know about names of different food items in the locality.
- (2) Health benefits of food.

The researcher displays various food items and ask the participants to identify them.

Set Induction: The researcher presents various food items and ask the participants to identify them one by one.

INSTRUCTIONAL PROCEDURE FOR DAY ONE

Content Development	Researcher's Performance Activity	Participant's Performance Activity	Instructional Materials	Instructional Strategy & Skills
Step I Meaning of Food	<ul style="list-style-type: none"> The researcher explains to the participants that food is any liquid or solid materials which after consumption and digestion can provide the body with nourishment. 	<ul style="list-style-type: none"> The participants should say what they understand by the word food from messages on the flipchart and they give correct answers to oral questions. 	<ul style="list-style-type: none"> Various food items Pens Poster Visual aids 	<ul style="list-style-type: none"> Questioning Brain storming Group discussions Pre-test
STEP 2 Classes of food/ Source Body building food protein	<p>1. Body building food these are proteins</p> <p>2. Body needs protein to build and repair all body tissues</p> <ul style="list-style-type: none"> Important in the formatting of milk during location and in the process of blood clotting among others, sources includes soya beans, okpa, chicken, beans, and egg, 	<p>Participants should say what they think is meant by each class of food and mention some sources of protein such as peas, milk and peanuts roasted.</p>	<ul style="list-style-type: none"> Posters Real food items Flipchart 	<ul style="list-style-type: none"> Group Discussions Explanation Examples
STEP 3 Classes of food/ Sources Energy foods Carbohydrates and fats	<p>(2) Energy food – These are Carbohydrate and fats</p> <ul style="list-style-type: none"> Carbohydrates serve as source of heat and energy. Give flavor and variety to the diet. Carbohydrates sources are sugar, Rice, white flour, potatoes Fats sources includes palm oil, groundnut oil, butter, olive oil among others. 	<ul style="list-style-type: none"> Participants should say what they think is meant by each classes on the flip chart. 	<ul style="list-style-type: none"> Flip chart Marking pens Posters Real food items 	<ul style="list-style-type: none"> Explanation Examples Group Discussion
STEP 4 Protective food – vitamins and minerals	<p>(3). Protective foods: These protect body from diseases. They are vitamins and minerals. Vitamins are formed in living things and are needed in small amount for life and growth, Vitamins help to build bones and tissues, vitamins are divided into groups.</p> <ul style="list-style-type: none"> Fat-soluble Vitamins. These dissolve in fat and can be 	<p>Participants should say what they think is meant by vitamin and mineral food. They give correct answers to oral questions</p>	<p>Poster Pen Visual aids</p>	<ul style="list-style-type: none"> Questioning Group discussion Brain storming

<p>STEP 5 Classes of food Water and Health Benefit of food</p>	<p>store in the body. They are found in oils, vegetables and organ meats such as livers and kidneys, Vitamin A, D, E and k, while water soluble vitamins are Vitamins that can dissolve in water but not in fats and oil. They can be stored by the body to a large extent. They must be eaten more often than fat soluble vitamin. Example fruits and vegetables, vitamin B1, B2, B6, B12, Folic acid, Niacin & Vitamin C.</p> <ul style="list-style-type: none"> • Minerals are used to regulate a wide range of body processes from one formation to blood clotting. They are also important to the body functioning, development of bones and teeth eg Calcium, Iron, Iodine and phosphorous. Source-milk, eggs, green vegetables, live and seafood. <p>The researcher explain to the participants that water is the major component of all living thing s. it is very essential for the existence of plants and animals. It is made of two elements: Hydrogen and Oxygen with the formula H₂O. Water has no energy value, it is odourless, colourless and tasteless. It is about the two third of the body weight.</p> <ul style="list-style-type: none"> • Functions of Water: Water is good solvent serves as the medium for various biochemical reactions in the body. • Regulates body temperature • Keeps the lining of the membranes of the organs moist and hence reduces friction 	<p>- Participants should say what they think is meant by each food or items from messages on flip chart.</p>	<ul style="list-style-type: none"> • Flip chart • Posters • Visual aids • Real food items 	<ul style="list-style-type: none"> • Explanation • Examples • Group • Discussions
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STEP 6 Evaluation	<ul style="list-style-type: none"> • Quenches thirst among others • Health Benefit of Food-food provides the body with heat and energy. • It helps in the growth and repair of body tissues. • Protects the body from diseases • Roughage in food helps bowel movement and prevents constipation. • Necessary for good health & vitality. <p>The researcher asks the participants questions to evaluate them as follows</p> <ul style="list-style-type: none"> • Explain the meaning of food. • Identify classes of food and their sources. • What are health benefits of food. 	The participants listen and give correct answers to the oral questions	<ul style="list-style-type: none"> • Flip chart • Marking pens 	Questions and answers
STEP 7 Summary	<ul style="list-style-type: none"> • The researcher summarizes the major points covered in the lessons. • The researcher asks the participants to mention the most interesting thing they have learnt today. • Ask for and respond to questions. • Pose the learning objectives in question form to assess learning of the contents. 	The participant respond to the questions.	<ul style="list-style-type: none"> • Flip chart • Marking pens 	Questions and answers

APPENDIX J

Teaching Plan For Day Two

Subject: Nutrition Education

Topic: (a) Balanced Diet
(b) How do we get a balanced diet?

Duration: 2 hours

Specific Objectives:

By the end of the lesson, participants will be able to:

Cognitive Domain.

- (a) Explain what is meant by balanced diet
- (b) Mention how we get balanced diet

Affective Domain: Appreciate that it is good to eat a balanced diet

Psychomotor Domain: Write the main Nutrient in balanced diet.

Entry Behaviour:

The participants have known about meaning of food, classes of food, sources of each class and health benefits of food; and balanced diet.

Set Induction:

The researcher displays appropriate posters and asks the participants. a. what one can do to make diet balanced. b. What will happen when one eats unbalanced diet.

INSTRUCTIONAL PROCEDURE FOR DAY TWO

Content Development	Research's Performance Activity	Participant's Performance Activity	Instructional Materials	Instructional Strategy & Skills
Step I Balance diet – Meaning	Researcher explains to the participant that balance diet is a meal, which gives the body the right amount of every nutrients or group of foods. Different groups of people eg children, adolescents, pregnant mothers, the aged, vegetarian have different nutrition needs.	<ul style="list-style-type: none"> • Participants shall explain what is meant by balance diet. 	<ul style="list-style-type: none"> • Flipchart • Marking pens • Posters • Visual aids 	<ul style="list-style-type: none"> • Explanation • Brain storming • Group • Discussions
STEP 2 How do we get balanced diet	We get balanced diet when the food contain the six classes of food for instance energy giving food carbohydrates and fats, body building food such as protein and protective foods such as minerals, and vitamins. Individuals health is affected not only by what he eats but also by how much he eats. Eats in moderation, unhealthy, expired and contaminated food should be phased out. Avoid food rich in cholesterol to avert the risk of arteriosclerosis.	<ul style="list-style-type: none"> • Participants shall identify the food nutrients in balanced diet. 	<ul style="list-style-type: none"> • Flipchart • Marking pens • Posters • Visual aids 	<ul style="list-style-type: none"> • Explanation • Brain storming • Group • Discussion
STEP 3 Evaluation	The researcher asks the participants questions to evaluate them as follows: <ul style="list-style-type: none"> • What is balanced diet • How did we get balanced diet • Write the main nutrients in balanced diet 	<ul style="list-style-type: none"> • The participants listen and give correct answers to the oral questions 	<ul style="list-style-type: none"> • Flipchart • Marking pens 	<ul style="list-style-type: none"> • Questions and answer
STEP 4 Summary	<ul style="list-style-type: none"> • The researcher summarizes the major points covered in the lesson and respond to questions. The researcher as participants to mention the most interesting thing today. 	<ul style="list-style-type: none"> • The participants respond to the questions 	<ul style="list-style-type: none"> • Flipchart • Marking pens 	<ul style="list-style-type: none"> • Questions and answer

APPENDIX K

Teaching Plan For Day Three

Subject: Nutrition Education

Topic: Deficiency diseases/food borne diseases

Duration: 2 hours

Specific Objectives:

By the end of the lesson, participants will be able to:

Cognitive Domain.

- (a) Describe Deficiency diseases
- (b) Explain at least two examples of deficiency diseases
- (c) Say the meaning of food borne diseases classification/prevention

Affective Domain: Drop various misconceptions about food borne diseases

Psychomotor Domain: Write the causes of deficiency diseases.

Entry behaviour:

The participant have known about balanced diet.

Set Induction:

The researcher displays various pictures of children suffering from diseases and ask the participants to identify them by name.

INSTRUCTIONAL PROCEDURE FOR DAY THREE

Content Development	Researcher's Performance Activity	Participant's Performance Activity	Instructional Materials	Instructional Strategy & Skills
Step 1 Deficiency Disease	<p>These diseases are caused due to shortage or lack of specific nutrients in the meals we eat. Examples</p> <p>(a). Kwashiorkor- Caused by lack of protein in the diet. Common in children. Symptoms-Enlarge stomach - Swollen leg, skin becomes scaly, -Retardation growth</p> <ul style="list-style-type: none"> • Treatment-protein food should be increased in the child diet. <p>(b) Marasmus– This is a protein-calorie deficiency diseases.</p> <ul style="list-style-type: none"> • Symptoms. Body tissue wastes away and become saggy. • The growth is stunted • Treatment-child's diet should have high protein content like eggs, milk, fish, meat. 	<ul style="list-style-type: none"> • Participants shall identify symptoms of kwashiorkor and marasmus. 	<ul style="list-style-type: none"> • Posters of malnourished children • Flipchart • Marking pens 	<ul style="list-style-type: none"> • Demonstration • Explanation • Brain storming • Discussions
STEP 2 Anemia	<ul style="list-style-type: none"> • Caused by inadequacy of iron in the diet • Common in women and children • Iron enables the blood to carry oxygen in the body symptoms. • Weakness • Fainting • Paleness of skin • Treatment • The diet intake should include liver, eggs, spinach. 	<ul style="list-style-type: none"> • Participant shall identify symptoms of Anemia, ticket and treatment. 	<ul style="list-style-type: none"> • Posters • Flipchart • Marking pens 	<ul style="list-style-type: none"> • Demonstration • Brain storming • Explanation • Discussions
Rickets	<ul style="list-style-type: none"> • This diseases is common in children and old people • Deficiency of vitamin D • affects the borne cartilage and teeth • symptoms • borne deformed in children causing bowlegs and weak knees • in adults the cartilage and borne are soft. <p>Treatment Vitamin D plays important role in the cure of rickets – Vitamin D is sunshine</p>			

<p>STEP 3 Food borne diseases</p>	<p>Food Borne Diseases: are diseases that occur due to the consumption of contaminated food</p> <ul style="list-style-type: none"> classified into two groups <p>(a) Food poisoning: This illness is caused by a poison or toxin secreted by microorganism present in the food we eat or some chemical reactions in the food.</p> <ul style="list-style-type: none"> Examples of microorganisms that caused food poisoning are staphylococcus aurums, clostridium botulimum. Examples of poisonous chemical are lead, mercury and arsenic. <p>(b) Food Infection: This refers to an illness caused by a pathogenic organism carried by the food eaten and transmitted to man.</p> <ul style="list-style-type: none"> Examples of Organism that causes food infection is salmonella Symptoms-Intestinal pains, stomach upset, weakness, nervous disorder. 	<ul style="list-style-type: none"> Participants to identify classes of food borne disease and give examples 	<ul style="list-style-type: none"> Flipchart Marking pens Posters 	<ul style="list-style-type: none"> Explanation Discussions Demonstration Brain storming
<p>STEP 4 Prevention of Food borne diseases</p>	<ul style="list-style-type: none"> Maintaining good personal hygiene Proper cooking of food before consumption Ensuring that leftover cooked foods are reheated before consumption Covering of when not ready for consumption Avoid consumption of expired foods among others. 	<ul style="list-style-type: none"> Participants identify some ways of preventing food borne diseases 	<ul style="list-style-type: none"> Flip chart Marking pens Posters 	<ul style="list-style-type: none"> Explanation Discussion Demonstration
<p>STEP 5 Evaluation</p>	<p>The researcher ask the participants to</p> <ul style="list-style-type: none"> Described deficiency diseases Give at least two examples Say meaning of food borne diseases and mention two prevention of food borne diseases. 	<ul style="list-style-type: none"> Participants listen and give correct answers to the oral questions 	<ul style="list-style-type: none"> Flipchart Marking pens 	<ul style="list-style-type: none"> Questions and answers.
<p>STEP 6 Summary</p>	<p>The researcher summarizes the major points covered in the lessons</p> <ul style="list-style-type: none"> Asks for and respond to question The trainer asks the participants to mention the most interesting thing they have learnt today. 	<ul style="list-style-type: none"> The participants respond to the questions 		<ul style="list-style-type: none"> Questions and answers.

APPENDIX L

Teaching Plan For Day Four

Subject: Nutrition Education

Topic: (a) Food Taboos/Healthy Feeding Habit
(b) Hazards of Food Taboos
(c) Health benefits of healthy feedings habits.

Duration: 2 hours

Specific Objectives:

By the end of the lesson, participants will be able to:

Cognitive Domain.

- (a) Explain food Taboos
- (b) Mention hazards of food Taboos
- (c) Describe the health benefits of healthy feeding habits

Affective Domain: Personally identify food hazards, explain to them and guidelines for healthy feeding habits.

Psychomotor: List the major sources of food and health benefit of food.

Entry behaviour:

The researcher reviews the previous lessons which among other things include: Deficiency diseases and food borne diseases

Set Induction

The researcher asks the participants to mention some of the foods that is not eaten by their community.

INSTRUCTIONAL PROCEDURE FOR DAY FOUR

Content Development	Trainer's Performance Activity	Participant's Performance Activity	Instructional Materials	Instructional Strategy & Skills
Step I Food Taboos	<ul style="list-style-type: none"> • Researcher explain to the participants that food Taboos are food which are forbidden because of religious or cultural beliefs. Taboos deprive people from balanced diet. • Hazards of food Taboos-They can diminish essential nutrients needed in the body. • In young persons they may interfere with growth and development. 	<ul style="list-style-type: none"> • Participants identify some food Taboos in their community 	<ul style="list-style-type: none"> • Flipchart • Posters • Marking pens 	<ul style="list-style-type: none"> • Demonstration • Brain storming • Discussions • Explanations
STEP 2 Health benefits of healthy feeding habit	<ul style="list-style-type: none"> • Healthy feeding habit-results from choosing nutritious food in a conscious way • Unhealthy feeding habit: results from making poor food choices over a period of time. • Health benefit-look and feel better • Have more energy • Prevent you from getting some diseases later in life eg diabetes, obesity, heart diseases 	Participants discuss in their small groups the benefits of healthy feeding habit	<ul style="list-style-type: none"> • Flip chart • Marker • Posters 	<ul style="list-style-type: none"> • Explanations • Demonstration • Discussions.
STEP 3 Guidelines for health feeding habits	<ul style="list-style-type: none"> • Eat a variety of foods. Eat food from all the food groups • Balance the food you eat with physical activity • Always eat three balanced meals everyday • Choose diet with plenty of grain products, vegetables and fruits. • Choose a diet that is moderate in salt and sodium • Always wash your hands before and after meal. 	Participants raise points	<ul style="list-style-type: none"> • Flip chart • Marker • Poster 	<ul style="list-style-type: none"> • Questioning and explanation

STEP 4 Evaluation	<ul style="list-style-type: none"> • Researcher asks the participants to explain food Taboos mentioned hazard of food. Taboos and Described health benefits of healthy feeding and guidelines for health feeding habits. 	<ul style="list-style-type: none"> • The participants listen and give correct answers to oral questions 	<ul style="list-style-type: none"> • Flipchart • Marking pens 	<ul style="list-style-type: none"> • Questions and answers.
STEP 5 Summary	<ul style="list-style-type: none"> • The researcher summarizes the major points covered in the lesson and ask the participants to mention the most interesting thing they have learnt today. • Asks for and respond to questions. 	<ul style="list-style-type: none"> • The participants listen and give correct answers to oral questions. 	<ul style="list-style-type: none"> • Flip chart • Marking pens 	<ul style="list-style-type: none"> • Questions and answers

APPENDIX M

Teaching Plan For Day Five

Subject: Nutrition Education

Topic: (a) Food hygiene-preparation
(b) Healthy rules for food hygiene
(c) Food preservation

Duration: 2 hours

Specific Objectives:

By the end of the lesson, participants will be able to:

Cognitive Domain:

- (a) Explain food hygiene
- (b) Enumerate guidelines of successful preparation of food
- (c) Describe healthy rules for food hygiene
- (d) Mention at least two ways of preserving food.

Affective Domain: Appreciate what they have learnt

Psychomotor: Demonstrate the correct ways of preserving food.

Entry behaviour:

The participants have known food taboos, food hazards, Deficiency diseases and food borne diseases and are aware of how they can prevent them.

Set Induction

The researcher displays a poster of two people one healthy and one unhealthy and asks the participants to identify the one that feeds well and one that is not feeding well and asks them the causes.

INSTRUCTIONAL PROCEDURE FOR DAY FIVE

Content Development	Researcher's Performance Activity	Participant's Performance Activity	Instructional Materials	Instructional Strategy & Skills
Step 1 Food hygiene – preparation	<p>Food hygiene means preventing harmful bacteria from growing, keeping the kitchen, appliances, tools and yourself clean, as well as washing, cooking preserving and storing food properly. This is also called food sanitation</p> <ul style="list-style-type: none"> • Guidelines for success preparation of food • Plan what to cooked, how and when to cook, meal should be balanced • List all the ingredient required • Write a shopping list, buy necessary ingredients • Arrange the kitchen for your cooking • Clean all the utensils • Make yourself clean. 	<ul style="list-style-type: none"> • Participants to identify guidelines for food preparation 	<ul style="list-style-type: none"> • Flipchart • Posters • Marking pens 	<ul style="list-style-type: none"> • Presentations • Class discussions • Questions and answers
STEP 2 Healthy rules for food hygiene	<ul style="list-style-type: none"> • Wash cooking utensils, cutting boards and other surface thoroughly. Wash fresh fruits and vegetables thoroughly. • Wash the tops of Cans such as canned milk, tomatoes beef before opening • Use clean plate for cooked food • Use a tissue paper when you must sneeze or cough and turn away from the food, then wash your hands • Cover your hair when in the kitchen so as to keep their hair out of the food. • Keep pests away from all food and the kitchen. 	<ul style="list-style-type: none"> • Participants identify healthy rules for food hygiene 	<ul style="list-style-type: none"> • Flipchart • Posters • Marking pens 	<ul style="list-style-type: none"> • Trainer presentations • Class discussions • Questions and answers
STEP 3 Food preservation canning, Drying, Refrigeration, Bottling and Smoking.	<p>Food is mainly preserved to prevent wastage due to delay. Decay is caused by the growth of microorganism such as yeast, moulds and bacteria. Methods include canning –placing the food already prepared in a</p>	<ul style="list-style-type: none"> • Participants identify some of methods use in preserving food. 	<ul style="list-style-type: none"> • Flipchart • Posters • Marking pens 	<ul style="list-style-type: none"> • Explanation • Class discussions • Questions and answers.

<p>STEP 4 Evaluation</p>	<p>metal can or glass jar and sealed.</p> <ul style="list-style-type: none"> • Drying. Dried in the sun or by artificial heat • Refrigeration. Preserving food under very low temperature. It renders the bacteria ineffective or inactive. • Bottling – This type of method adopts the same pineapple as that of canning, you force liquid into the bottle. • Smoking – Smoking of fish and meat often following salting it destroy or slow down the action of spoiling agents. <ul style="list-style-type: none"> • The researcher summarizes the major points, covered in the lessons and asks the participants to mention the most interesting thing they have learnt. • Asks for and respond to questions. 	<ul style="list-style-type: none"> • The participants listen and give correct answers to the questions 	<ul style="list-style-type: none"> • Flipchart • Marking pens 	<ul style="list-style-type: none"> • Questions
<p>STEP 5 Summary</p>	<ul style="list-style-type: none"> • The researcher asks the participants to mention the most interesting thing they have learnt today. 	<ul style="list-style-type: none"> • The participants respond to the questions 		<ul style="list-style-type: none"> • Questions and answers

APPENDIX N

Teaching Plan For Day Six

Subject: Nutrition Education

Topic: (a) Economic buying of healthful food stuffs
(b) Factors to consider when buying food
(c) Wise buying practices

Duration: 2 hours

Specific Objectives:

By the end of the units, participants will be able to:

Cognitive Domain.

- (a) Explain Economic buying of healthful food stuffs
- (b) Describe wise buying practices
- (c) Mention factors to consider when buying food

Affective Domain: Appreciate what they have learnt

Psychomotor Domain: Write out the main factors to consider in buying food

Entry Behaviour:

Women have been familiar with buying of food, they are part of it and they live with food they bought.

Set Induction

The researcher ask the participants how they bought the food they cook and what they have in mind when buying food.

INSTRUCTIONAL PROCEDURE FOR DAY SIX

Content Development	Researcher's Performance Activity	Participant's Performance Activity	Instructional Materials	Instructional Strategy & Skills
Step 1 Economic buying of healthful food stuffs.	Researcher explain to the participant how they can buy a healthful food stuffs economically, for instance if one is given two thousand naira she can manage it to cook soup for the family.	<ul style="list-style-type: none"> The participants listen to the researcher explanation and asks questions where necessary. 	<ul style="list-style-type: none"> Flipchart Marking pens Posters 	<ul style="list-style-type: none"> Explanations Class discussions Questions and answers.
STEP 2 Factors to consider in buying food	<ul style="list-style-type: none"> Size of the family: a family of three persons will require less food than a large family of ten The family food needs Food preservation and storage facilities available to the family Quality of food Money available to the family Buying where food stuff is best and cheapest Buying non-perishable foods in bulk and store properly 	<ul style="list-style-type: none"> The participants to identify the factors to consider in buying food. 	<ul style="list-style-type: none"> Flipchart Marking pens Poster 	<ul style="list-style-type: none"> Researcher presentation Class discussions Questions and answers
STEP 3 Wise buying practices	<ul style="list-style-type: none"> Making a good shopping list Keep to the shopping list when buying Ensure that there are adequate storage facilities for the food stuff to be purchased Read labels on food containers such as canned food, bottled food, and check expiry dates, food content, weights and volume. Compare values and prices in different stores and with different sellers Judge the quality of food before buying Judge values of food before buying 	<ul style="list-style-type: none"> The participants identify some wise buying practices 	<ul style="list-style-type: none"> Flipchart Marking pens Posters 	<ul style="list-style-type: none"> Trainer presentation Class discussions Questions and answers
STEP 4 Evaluation	<p>Researcher asks the participants to</p> <ul style="list-style-type: none"> Explain economic buying of food Described wise buying practices mention factors to consider when buying food. 	<ul style="list-style-type: none"> The participants listen and give correct answers to the oral questions. 	<ul style="list-style-type: none"> Flipchart Marking pens 	<ul style="list-style-type: none"> Questions and explanation

<p>STEP 5 Summary</p>	<ul style="list-style-type: none"> • The researcher summarizes the major points covered in the lessons and asks the participants to mention the most interesting thing they have learnt • Asks for and respond to questions. 	<ul style="list-style-type: none"> • The participants listen and give correct answer to the oral questions 	<ul style="list-style-type: none"> • Flipchart • Marking pens 	<ul style="list-style-type: none"> • Questions and answers
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APPENDIX O

Teaching Plan For Day Seven

Subject: Nutrition Education

Topic: Post-test

Duration: 2 hours

Specific Objectives:

At the end of the lesson the participants shall

Cognitive Domain.

Be able to recall the major points covered in the six lessons.

Affective Domain: Appreciate the benefits of food

Psychomotor Domain: Answers Post-test questions.

Entry Behaviour:

The researcher asks the participants to recall the major points covered in the six lessons.

Set Induction

INSTRUCTIONAL PROCEDURE FOR DAY SEVEN

Content Development	Researcher's Performance Activity	Participant's Performance Activity	Instructional Materials	Instructional Strategy & Skills
Post-test	The researcher should administer the post-test	<ul style="list-style-type: none"> • Participants to answer the post test questionnaire 	<ul style="list-style-type: none"> • Copies of questionnaire marking pen 	<ul style="list-style-type: none"> • Questions and answers • Post test evaluation