KNOWLEDGE, ATTITUDE AND PATTERNS OF FRUIT CONSUMPTION AMONG PREGNANT WOMEN IN IDO LOCAL GOVERNMENT AREA, OYO STATE, NIGERIA

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DEDICATION

This project work is dedicated to my heavenly Father, in whom I live, move and have my being and whose unfailing love, grace, mercy and favour has brought me this far. The Alpha and Omega, the captain of my salvation, the One who has called me into His marvellous light and given me a mission to serve on earth.

And

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ABSTRACT

Nutrient intake is important to the well-being of pregnant women and the foetus. The importance of fruits intake in pregnancy is for foetal growth development and reduction of complications associated with inadequate nutrition in pregnancy. Few documented studies have indepthly assess the knowledge and practice of fruits consumption pattern among pregnant women in Oyo State. Therefore, this study was therefore designed to assess the knowledge, attitude and pattern of fruits consumption among pregnant women in Ido Local Government Area, Oyo State.

A descriptive cross-sectional study using a three-stage sampling technique was employed to select 120 consenting pregnant women in the community. A semi-structured interviewer-administered questionnaire was used to elicit information on respondents' socio-demographic characteristics, knowledge of and attitude to fruits consumption. Knowledge of fruit consumption was measured on a 27-point scale; scores of ≤8, >8-18 and >18 were categorised as poor, fair and good respectively. The attitude towards fruits consumption was measured on an 8-point scale: scores of ≤4, and >4 were categorised as negative and positive respectively. Data were analysed and results presented using descriptive statistics, Chi-square test and logistic regression test at p=0.05.

The respondents' age was 28.6±4.4 years and 62.5% had completed secondary education with income ranging from ₦1000 to ₦80000 per month. More than half (59.2%) had poor knowledge of fruits consumption with a score of 20.2±2.9. There was a significant relationship between respondent's educational level and knowledge of fruit consumption. Majority (90.8%) had a positive attitude towards fruits consumption with an attitude score of 5.5±0.9. Majority (94.2%) of the respondents consumed at least one fruit per week preceding the survey. However, mixed fruits consumption was low (5.8%): twenty seven percent (27.0%) of the respondents consumed fruits twice during the same period. Most commonly consumed fruits during pregnancy were oranges (23.7%), watermelon (14.7%) and pineapple (12.0%). Few (10.8%) disliked consumption of fruits especially paw-paw and grape while (26.1%) avoided them during pregnancy. Only 7.5% reported

fruit taboos such as dika fruit (*oro*) and guava. A significant relationship was established between educational level, income and frequency of fruit consumption. The major barriers to fruit consumption were inadequate nutritional knowledge on the importance of fruits (67.5%), seasonal variation of fruits (64.2%), perishability of fruits (55.8%) and non-availability of desired fruit (45.8%). Respondents with tertiary education were more likely to have good knowledge about fruit consumption than respondents with secondary and primary education (OR=5.04 C.I. 0.38- 3.71). Respondents with low income were less likely to consume fruits (OR=6.7 C.I. 2.2- 2.0) while respondents with secondary education were more likely to have low consumption pattern of fruits compared with respondents with tertiary education (OR=8.4 C.I. 3.24- 21.67).

Poor knowledge and low consumption of fruits during pregnancy existed among the pregnant women despite their positive attitudinal disposition towards fruits consumption. Health promotion strategies such as health education, awareness campaign and community sensitisation targeted at pregnant women at the community level are needed to address this gap.

Keywords: Fruit consumption pattern, pregnant women, fruit taboos, pregnancy-related diet

Word count: 484

CERTIFICATION

I hereby certify that this research work was carried out by Adebisi Ajoke ADELAJA in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan.

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LIST OF ACRONYMS

LBW	–	Low birth weight
IUGR	–	Inter Uterine Growth Retardation
FAO	–	Food and Agricultural Organization
FMOH	–	Federal Ministry of Health
USAID	–	US Agency for International Development
TV	-	Television
NMR	–	Neonatal Mortality Rate
MMR	–	Maternal Mortality Rate
WHO	–	World Health Organization
ILGA	–	Ido Local Government Area
LGA	–	Local Government Area

OPERATIONAL DEFINITION OF TERMS

Pregnancy: Pregnancy is a critical stage during which good maternal nutrition is a key factor that influences the health of both mother and the child (foetus) (Ademuyiwa and Sanni 2013).

Barriers: Factors that may hinder the decision to take health precaution such as adequate fruit consumption during pregnancy.

Healthy choices: Refer to those steps taking or decisions during pregnancy that may promotes the health of mother and the foetus during pregnancy (Sarkodie,Commey,Tetteh,Saaka and Golley 2014)

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Nigeria has abundant variety of fruits which are rich sources of nutrients and minerals to the populace. Pregnancy is associated with physiologic changes that result in increased plasma volume and red blood cells and decreased concentrations of circulating nutrient-binding proteins and micronutrients. In many developing countries, these physiologic changes can be aggravated by under-nutrition, leading to micronutrient deficiency states, such as anaemia, that can have disastrous consequences for both mothers and new-born infants (Ladipo, 2013). It is widely recognized that current dietary behaviour is often poorly in line with health recommendations. Therefore, it is often desirable to try to change unhealthy behaviour from a public health perspective. However, many studies showed that it is very difficult to effectively change consumers' food choices and dietary behaviour. The extent to which nutrition education programmes can facilitate dietary change is likely to be influenced by behavioural characteristics such as the habit persistence in diets, perception of health risks, expectancies and motivation for dietary change (Raine, 2005).

While habit plays an important role in the context of food choice specific events or changes in life such as pregnancy can have a major impact upon these habits. For example, when pregnancy occurs especially in early adulthood when many women are still forming their adult dietary patterns, food patterns are less likely to be bound by strong habits (Wim, Verbeke, Ilse and Bourdeaudhuij 2007). Furthermore, during pregnancy, women are more conscious of food and health issues. Pregnancy is a critical period during which good maternal nutrition is a key factor influencing the health of both mother and child. Following an appropriate diet will provide the necessary amounts and varieties of nutrients to ensure an optimal health for both the mother and the baby (Wim et al, 2007). Pregnant women require more energy and nutrients to meet the demands of the developing foetus, and can select suitable servings of foods to meet their increased needs. Given the importance of pregnancy in people's lifecycle, some diet and lifestyle health risks involved, and the fact that specific dietary recommendations are issued, being pregnant can be assumed to lead to different food

choices, which makes pregnant women an interesting target group for communication and information on current and future nutritional choices.

To gain insight into the most effective way to induce dietary changes, it is important to analyse whether pregnant women have different beliefs, behaviour and dietary patterns as compared to non-pregnant women. Research showed that pregnant women do change behaviours during pregnancy and they make a conscious effort to improve their food intake in line with health advice (Wim et al, 2007). More likely, they are either influenced by social pressure from doctors and family members, which imply that information from these personal sources, could provide valuable support for dietary change. In other studies, it was found that dietary behaviour during pregnancy is characterized by specific food cravings or food aversions or determined by specific psychological variables. The most predominant changes in the behaviour of pregnant women concerned food choice and eating habits. Most women tried to consume more fruit and vegetables, and identified many foods to be eaten less or avoided completely during pregnancy. Yet another study in India showed that pregnant women alter their dietary behaviour by including or excluding certain food items because of their pregnancy (Wim et al 2007). This study is therefore designed to assess the knowledge, attitude and consumption pattern of fruits among pregnant women.

1.2 Statement of Problem

Pregnant women have been widely recognized as a vulnerable group from health point of view (WHO 2003). They need more food than normal person for the proper nourishment of the growing foetus. Maternal nutritional status is of great concern to health professionals because of the effects it has on both the pregnant woman and her unborn child. An important contributor to good pregnancy outcome is the nutritional status of the mother, which is a factor of adequacy or otherwise of the dietary intake in pregnancy (Olatuji and Akinlabi 2012). Sustained increase in dietary consumption of fruit among pregnant women is essential for reduction of morbidity and mortality among pregnant women.

The result of Olivia and Uwaoma (2012) study among pregnant women in south eastern part of Nigeria show that pregnant women consumed less fruits and were low in micronutrients status thus they manifested 73% anaemia in their first trimester and 84% during their third trimester. Given the low fruit consumption among pregnant women, it is not surprising that

UNICEF (2009) estimated that in each year, more than half a million women die from causes related to pregnancy and childbirth. Nearly 4 million newborns die within 28 days of birth while millions suffer from disability, disease, infection and injury. The life time risk of maternal death for a woman in a least developed country is more than 300 times greater than for a woman living in an industrialised country.

Furthermore, observation of the author at the field work site in Ido LGA, Ibadan suggests that pregnant women are not consuming fruits as desired. This and the above reports stimulate the conduct of this work.

1.3 Justification for the Study

Nutrient intake is important to the well-being of pregnant women and the foetus. Since the maternal malnutrition before or during pregnancy can lead to mothers poor adaptation to pregnancy, shortening duration of pregnancy, reduction in foetal growth in uterus, Furthermore, it increases risk for pregnancy complications and can cause anomalies that kill or limit potential of the child and causes low birth weight (LBW): < 2500g (Ademuyiwa and Sanni 2013).

Fruit as opposed to vegetable consumption is of greater interest because increment in fruit consumption is relatively easier. Fruit is consumable at work, home, on transit, and requires no cooking (Ibrahim 2011).

In view of the nutritional and health benefits of fruits, the results from this study will contribute to the growing body of knowledge, provide a basic knowledge of the great differences in fruit consumption seen in the different areas as a basis for future studies on disease endpoints, as well as providing information to help guide future policy initiatives to promote greater consumption of fruit.

1.4 Broad objective

The main objective of this study was to investigate the Knowledge, Attitude and fruits Consumption pattern among pregnant women in Ido Local Government Area.

1.5 Specific objectives.

The Specific objectives of this study were to:

1. Assess the level of knowledge of pregnant women on the importance of fruit consumption during pregnancy.
2. Determine the attitude of pregnant women towards fruit consumption during pregnancy.
3. Determine the frequency of fruit consumption among pregnant women in Ido LGA.
4. Identify the barriers affecting the adequate consumption of fruits during pregnancy.

1.6 Research questions:

1. What is the level of knowledge of pregnant women on the importance of fruit consumption during pregnancy?
2. What are the attitudes of pregnant women towards fruit consumption during pregnancy?
3. What is the frequency of fruit consumption among pregnant women?
4. What are the barriers affecting adequate consumption of fruits during pregnancy?

1.7: Research Hypotheses

Null hypothesis:

Ho 1: There is no association between respondents' age and knowledge of fruit consumption among pregnant women.

Ho 2: There is no association between respondents' level of education and knowledge of fruit consumption

Ho 3: There is no relationship between respondents' knowledge and frequency of fruit consumption

Ho 4: There is no association between respondents' level of education and frequency of fruit consumption among pregnant women.

Ho 5: There is no association between respondents' income level and frequency of consumption pattern of fruit among pregnant women.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Nigeria as a developing country is experiencing food shortage as a result of population growth, competition for fertile land, poverty, lack of agricultural inputs; poor loan scheme and incentives (Bello, Falade, Adewusi and Olawole 2008) .The diets of most Nigerians are high in carbohydrates and deficient in protein, fruits and vegetables. Fruits and vegetables are essential part of a healthy diet. Therefore, nutritionists have advised that eating at least five portions of fruits and vegetables a day can help people especially pregnant women to maintain good health during pregnancy and throughout their lives, protecting them from heart disease and cancer, type 2 diabetes and kidney stones (USAID 2003; Food commission research 2013). Some studies have shown that higher consumption level of fruits and vegetables has a strong correlation with better quality of life and higher life expectancy (González et al., 2008). Furthermore many researchers have found out that adequate amount of fruits and vegetables consumption every day is able to prevent different chronic diseases like heart disease, cancer, diabetes and obesity, as well as prevent and alleviate several micronutrient deficiencies (WHO, 2009; Ness & Powles, 1997). In addition to this, consuming a diet high in fruits and vegetables as part of an overall healthful diet can aid in weight management (Blanck et al., 2008). Fruits, such as oranges, banana, watermelon, pineapple, guava, pawpaw abound in Nigeria and are consumed heavily in season because storage technology is not available to preserve the excess production, therefore the little that are preserved are very costly when the fruits are out of season; this prevent the pregnant women from fruit consumption.

2.2 Concept of fruits

A fruit is defined as a part of a flowering plant that derives from specific tissues of the flower, one or more ovaries and in some cases accessory tissue (Brown, Iezzoni, and Fogle 1996). Fruit normally means the fleshy- seed associated structures of a plant that are sweet or sour and edible in the raw state such as apples, oranges, grapes, strawberries, banana and lemon (Beech, 1905). On the other hand, the botanical sense of fruit includes many structures that are not commonly called fruits such as bean pod, corn kernels, wheat grains, and tomatoes (Calhoun, 1995). In the culinary sense of these words, a fruit is usually any

sweet- tasting plant products, especially those associated with seeds, a vegetable is any savoury or less sweet plant product and a nut is any hard, oily and shelled plant products. These culinary vegetables that are botanically fruits include: cucumber, tomatoes, peas, beans, corn eggplant and pepper. In addition, some spices such as allspice and chillies are fruits botanically. Botanically, a cereal grain such as corn, wheat or rice is also a kind of fruit termed caryopsis.

There are biochemically active phyto-chemicals in fruits and vegetables, which are a large group of non-nutrient secondary metabolites which provide much of the colour and taste in fresh or processed fruits and vegetables. In plant-based diets these chemicals play a significant role in the health effects by assisting in prevention of diseases, and the best way to get the benefits of these substances is to increase the variety of the consumption in day to day life (Shils et al, 2005). Earlier studies have pointed out that including these phyto-chemicals in the diet may protect against cancers, cardiovascular disease and even neurodegenerative disorders like stroke, Alzheimer's and Parkinson's diseases (Mattson & Cheng, 2007). This finding is supported by similar study conducted on mouse model that indicated that blueberry supplementation prevented learning and memory deficits related to Alzheimer's disease (Joseph et al, 2003).

However, the fruit wall is very thin and is fused to the seed coat, so almost all of the edible grain is actually a seed. In botany, seeds are ripened ovules while fruits are the ripened ovaries or carpels that contain the seeds and a nut is a type of fruit and not a seed.
Fruits contain high quantity of water, carbohydrates, vitamins A, B1, B2, C, D and E and minerals such as calcium, magnesium, zinc, iron, potassium and organic compounds which are required in small amounts, to make the body function properly (Ekpete Ozioma, Edori Onisogen and Fubara 2013). Many fruits are used to make beverages and fruit juice (orange, apple, grape juices etc.) or alcoholic beverage such as wine and brandy. Iron (Fe) is required for energy and endurance because it delivers oxygen throughout the body. Iron is said to be an important element in the diet of pregnant women, nursing mothers, infants, convulsing patients and the elderly to prevent anaemia and other related diseases. The recommended daily allowance of iron for men is 7mg /day and 12-18 mg/day for women during pregnancy (Ekpete et al, 2013).

2.3 Types of Fruits

Plant scientist has grouped fruits into three main groups, simple fruits, aggregate fruits and composite or multiple fruits (Zohary and Spiegel-Roy, 1975)

a) **Simple fruits:** simple fruits can be either dry or fleshy, and result from the ripening of a simple or compound ovary in a flower with only one pistil. Dry fruits may be either dehiscent (opening to discharge seeds) or in dehiscent (not opening to discharge seeds). Fruits in which part of the pericarp (fruit wall) is fleshy at maturity are simple fleshy fruits. Types of fleshy, simple fruits are: berry (orange, cranberry), stone fruit or drupe.

b) Aggregate: An aggregate fruit from single flowers that have multiple carpels which are not joined together i.e. each pistil contains one carpel. Each pistil forms a fruitlets and collectively the fruitlets are called an *etaerio.*

c) Multiple fruits: A multiple fruit is a one formed from a cluster of flowers called an inflorescence. Each flower produces a fruit, but these mature into a single mass. Examples are: pineapple, fig and breadfruit.

d) Accessory Fruit: some of the edible part of accessory fruit is not generated by the ovary.

2.3.1 Seedless Fruits

Seedlessness is an important feature of some fruits of commerce. Bananas and Pineapples are examples of seedless fruits. In some species seedlessness, is the result of parthenocarpy it means the fruits are set without fertilization. Parthenocarpic fruit set may or may not require pollination but most endless citrus fruits require stimuli from pollination to produce fruit.

2.3.2 Uses of Fruits

Many hundreds of fruits including fleshy fruits like apple, peach, pear, kiwifruit, watermelon and mango are commercially valuable as human food both fresh and as jams, marmalade and other preserves. Fruits are also used in manufactured foods like cookies, muffins, yogurt, ice cream, cakes and many more. Many fruits are used to make beverages such as fruit juices (orange juice, apple juice, grape juice) or alcoholic beverages such as wine or brandy.

2.4 Nutritional Value of fruits

Fruits are generally high in fibre, water and vitamin C and sugars, although this latter varies widely from traces as in line to 61% of the fresh weight of the date (Watkins, R. 1995). Regular consumption of fruits are associated with reduced risks of cancer, cardiovascular

disease (especially coronary heart disease), stroke, Alzheimer disease, cataract and some of the functional declines associated with aging (Blanck et al, 2008).

Diets that include a sufficient amount of potassium from fruits and vegetables also help reduce the chance of developing kidney stones and may help reduce the effects of bone-loss. Fruits are also low in calories which would help lower one's calorie intake as part of a weight- loss diet (Cai et al, 2007).

2.5 Healthy eating during pregnancy

A healthy diet is an important part of a healthy lifestyle especially during pregnancy because it helps the baby to develop and grow well (Ekpete et al, 2013). Always eat a variety of foods to get all the nutrients needed. Recommended daily servings include 6-11 servings of bread and grain, two or four servings of fruits, four to more servings of vegetables, four servings of daily products and three servings of protein sources (meat, poultry, fish, egg and nuts) (Olivia and Nkwam 2012). Fruits contain high quantity of water, carbohydrates, vitamins A, B1, B2, C, D and E; and minerals such as calcium, magnesium, zinc, iron, potassium and organic compounds which are required in small amounts, to make the body function properly and thereby reducing the risk of diseases and constipation (Ekpete et al, 2013). Eat and drink at least four servings of dairy products and calcium-rich foods a day to help ensure that they are getting 1000-1300mg of calcium in daily diet during pregnancy. Eat at least three servings of iron-rich foods such as lean meats, spinach, beans, and breakfast cereals each day to ensure you are getting 27mg of iron daily (Queensland Health Dietitian/ Nutritionists, 2013). Always choose food high in fiber such as whole grain, breads, cereals, pasta and rice as well as fruits and vegetables (Queensland Health Dietitian/ Nutritionists, 2013).

Other essential components of healthy diet for pregnant women include the following.

2.5.1 Folate or Folic acid

According to study conducted by Queensland Health Dietician/ Nutritionists in (2013) shows that Folate (or folic acid) is needed for the growth and development of the baby. It is especially important in the month before one fall pregnant and the first trimester (three months) of pregnancy. A good intake of folate reduces the risks of your baby being born with some abnormalities such as spina bifida (a disorder where the baby's spinal cord does not form properly). Dietary sources high in folate include green leafy vegetables such as broccoli, spinach and salad greens, some fruits and cereals and breads with added folic acid.

All women planning a pregnancy and in the early stages of pregnancy should eat a variety of folate-containing foods and also take a folic acid supplement of 400 micrograms per day at least one month before and three months after you become pregnant. Every pregnant woman needs at least 400 micrograms of folic acid per day to help prevent neural tube defects such as spinal bifida. Choose at least one good source of folic acid every day like dark green leafy vegetables, legumes, beans, black beans. Eating atleast five potions of a variety of fruits and vegetable a day. These can be fresh, frozen, canned, dried or juiced. Always wash them carefully (Alice, Nti and Richard 2012).

2.5.2 Iron

The recommended daily allowance of iron for women during pregnancy is 12-18 mg/day (Ekpete et al, 2013). Iron is needed to form the red blood cells for the mother and the baby. It helps carry oxygen in mother's blood and is needed for the baby to grow. During pregnancy more iron is needed than when you are not pregnant. It is best to get the iron you need from your diet. Iron from animal food sources is absorbed more easily than iron from plant foods. The best sources of iron are lean meats (especially red meat), some vegetables (especially green leafy ones), legumes, and fortified cereals. Iron can be gotten from food which include vitamin C with meals (e.g. citrus foods, tomato, capsicum), animal protein with green leafy vegetables at a meal and using antacids sparingly (Queensland Health Dietitian/ Nutritionists, 2013).

2.5.3 Iodine

Adequate iodine in pregnancy is essential for baby's growth and brain development. Iodine is needed in higher amounts during pregnancy. It is now recommended that all pregnant women should take a supplement containing 150 micrograms of iodine. You still need to consume good food sources of iodine in addition to this supplement. These food sources include: fruit and vegetables, bread with added iodine seafood, eggs, iodized salt (Queensland Health Dietitian/ Nutritionists, 2013). 150 micrograms of iodine a day is needed to help ensure your baby's growth and development. Choose at least one good source of vitamin C everyday such as oranges, grape fruits, strawberries, papaya, tomatoes (Alice, Nti and Richard 2012).

2.6 Dietary guidelines during pregnancy

Dietary and nutritional guidelines for pregnant women are based on the Food Guide Pyramid. A higher intake of meat, fish and eggs is recommended because of the need for additional protein and consumption of red meat, such as beef, is particularly recommended as an important source of iron (Fe). Increased fish consumption during pregnancy is advised because adequate supply of polyunsaturated fatty acids influences the formation of structures of the nervous system and retina of newborn infants (Wim et al, 2007). Pregnant women are also recommended to eat more fruits and vegetables in order to realize a higher fibre intake and to increase the intake of dairy products because these are a good source of calcium, phosphorus and riboflavin, which are needed for the development of foetal bony structure and teeth as well as for the mother. Safe food handling is also an important aspect of good nutritional practices to prevent food-related diseases in pregnancy such as listeriosis and toxoplasmosis (Wim et al 2007). To reduce the risk of listeriosis and toxoplasmosis, pregnant women are recommended to avoid raw or undercooked fresh meat and chilled ready-to-eat food that is not freshly prepared (e.g. cold meats, salads, soft cheeses). They should also peel and wash raw fruit and vegetables thoroughly before consumption to remove contaminating soil. Pregnant women are recommended not to eat liver because of high vitamin A levels, which has been associated with miscarriages and teratogenic effects (Wim et al, 2007). Other key components of a health promoting lifestyle during pregnancy include moderate exercise, the avoidance of alcohol; the avoidance of active and passive exposure to tobacco smoke and other harmful substances. Women who exercise during pregnancy have reduced risks of gestational diabetes, hypertensive disease, preeclampsia and preterm birth (Wim et al, 2007).

2.7 Effect of Micronutrient deficiency during pregnancy

Micro-nutrient malnutrition has become a global problem of immense proportion. Deficiency of iron, vitamin A and iodine is associated with increased mortality rates amongst most poor women, infants and children. It has been suggested that vitamin A status of pregnant women can affect vitamin A source in the liver of the foetus (Olivia and Nkwam, 2012). The likelihood of a normal labor is better in women brought up in good circumstances, who have eaten a satisfactory diet from birth to maturity, received good medical care, and continue to have these advantages during pregnancy than those women of the poorer socio-economic classes. Hence poor maternal nutrition, before and during pregnancy is a major cause of poor pregnancy outcomes especially in developing countries.

Micronutrient deficiency during pregnancy contributes to poor maternal weight gain which affects the birth weight of babies. Weight gain during pregnancy is widely used as an indicator of the adequacy of nutrition during pregnancy and has been associated with infant outcome such as mortality, prematurity and low birth weight.

Poor nutrition and inadequate micronutrient's intake during pregnancy often begin in uterus and extend throughout the life cycle (Olivia et al, 2012).Under nutrition manifests in decreased maternal height (stunting), and below normal maternal pregnancy weight and pregnancy weight gain. Infants born with low birth weight (IBW) suffer extremely low weight, morbidity and mortality from infectious and diseases and are underweight, stunted or wasted beginning in the neonatal period and through childhood. Infants weighing 2.0-25kg at birth are more likely to die during their first 28days of life than infants who weigh 2.5-3.0kg and 3.0-3.5kg at birth. Death of infants, especially among Nigerians who highly value children, goes with numerous psychological challenges such as depression, guilt, spouse abuse and divorce. Low birth weight is associated with impaired immune function, poor cognitive development and risk of developing acute diarrhea or pneumonia (Olivia et al, 2012)

It is postulated that almost half of infant deaths from pneumonia and diarrhea could have been prevented if low birth weights as a result of low nutrient status of their mothers were eliminated. Infants born with LBW face an increased risk of chronic diseases including high blood pressure non-insulin dependent diabetes mellitus, coronary heart diseases and stroke in adulthood. Again these diseases are killers among rural and poor folks in developing nations and often create opportunities for allied illnesses among children, infants, and adults (Olivia et al, 2012). Studies in Dietary intake and micronutrient status show that maternal micronutrient deficiency in iron, vitamin A, zinc and vitamin B12, iodine and folate are widespread and have a negative impact on pregnancy outcome. Thus, it is established that micronutrient deficiency plays a major role in increasing morbidity and mortality. Poor cognitive development, marasmus, poor psychomotor development, growth retardation and inadequate nutritional balance are some of the adverse consequences of low pregnant mothers' micronutrients status (Olivia et al, 2012).

Micronutrients have important influences on health of pregnant women and the growing foetus:

- Iron deficiency results in anaemia which may increase the risk of death from hemorrhage during delivery.
- Folic acid deficiency can lead to hematological consequences, pregnancy complications and congenital malformation.
- Zinc deficiency has been associated with some complications of pregnancy and delivery as well as with congenital abnormalities and growth retardation.
- Vitamin A deficiency (VAD) is one of the nutritional problems in Nigeria that is of public health importance as it may increase morbidity and mortality risk and negatively affect vision. Vitamin A (retinol) is an essential micro-nutrient needed in small amounts by humans for the normal functioning of the visual system, growth and development; and maintenance of epithelial cellular integrity, immune function and reproduction. Vitamin A is an essential micronutrient for growth especially in highly proliferative and development stages of pregnancy.
- Vitamin A thus plays an important role in reproduction and cell differentiation and proliferation. It has also been found to be involved in organ development and maturation. When maternal vitamin A is deficient, fetal demands do not allow maintaining maternal reserves and subclinical deficiency appears because pregnancy is a period of vulnerability to nutritional deficiencies.
- Vitamin A deficiency is a serious public health problem. It is one of the serious nutritional disorders in the world (Olivia et al, 2012)

2.8 CONSEQUENCIES OF MALNUTRITION

The consequences of malnutrition in life stages are illustrated in the table below;

Table 2.1: The consequences of Malnutrition

Life Stage Nutritional	**Common Disorders**	**Main Consequences**
Infant & Young Child	Protein-energy malnutrition, iodine iron, zinc and vitamin A deficiencies	Developmental retardation (**stunting and wasting**) Increased risk of infection, High risk of death, Blindness Anaemia
Pregnant & Lactating Mothers	Protein-energy malnutrition, iodine, iron, calcium, folate and vitamin A deficiencies	Insufficient weight gain in pregnancy–IUGR Maternal anaemia, Maternal mortality, Increased risk of infection, Night blindness/blindness, Low birth weight/high risk death rate for foetus.

Source: Unicef, 2011)

2.9 Knowledge of Pregnant Women on the Importance of Fruit Consumption during Pregnancy

Lack of dietary knowledge and the knowledge about consequences of malnutrition among future mothers may result in a lot of dietary indiscretions. Accordingly, maternal dietary habits, poor dietary pattern and poor nutritional status of women before and during pregnancy are one of the major causes of malnutrition (Alice, Christian and Richard 2012). Malnutrition, especially in pregnancy can be combated by eating enough fruits and vegetables. Fruit and vegetable consumption is crucial to the availability of micronutrients to the body. This is because these food items are a rich source of vitamins and minerals which are required for the normal functioning of the human body (Ruel, et. al, 2004). However, the knowledge and intake of this essential aspect of nutrition is globally poor (Mathilda, 2012). Furthermore, both knowledge and attitude of pregnant women to fruit and vegetable intake has been noted globally to be below nutritionally recommended and acceptable limits. (United States Center for Disease Control (CDC), Morbidity and Mortality, 2011; Sheikh, 2006). The picture in developing countries is not much different; pregnant women knowledge and intake of fruits and vegetables is low, but is dependent on income and individuals' perception of the importance of these food items to adequate nutrition (Ibrahim, 2011).

Pregnant women are also recommended to eat more fruit and vegetables in order to realize a higher fibre intake and to increase the intake of dairy products because these are a good source of calcium, phosphorus and riboflavin, which are needed for the development of fetal bony structure and teeth as well as for the mother. Fruits and vegetables are important in the diet of pregnant women because they contain cellulose which is useful as roughage. Also, fruits and vegetables are rich in vitamins and mineral elements which protect the body against diseases. Improper consumption pattern and dietary practices of pregnant women can lead to increase rates of stillbirths, premature birth and low birth weight, maternal and prenatal death (Sarkodie, Commey, Tetteh, Saaka, and Golley 2014).

2.10 Influence of Attitude and Socio-Cultural Factors Affecting Pregnant Women Consumption of Fruit during Pregnancy

Attitude and socio-cultural factors exert important effects on maternal health care choices and practices. Socio-cultural practices reflect attitudes, values and beliefs held by members of the community for periods often spanning generation (Henry et al, 2003). Several studies

(Blitstein, Snider and Evans, 2012) show that fruits and vegetables purchases of the pregnant women are influenced from variety of factors such as prices, family influences, accessibility and availability, income level, and social support, attitude, habit, knowledge and practices. Some qualitative research highlighted the major influences on food purchased were taste, preferences, habit and nutritional concern (Henry et al, 2003). Leibtag and Kaufman (2003) suggested lower-income families economize on their food expenditure by purchasing foods on sale, store brand, less expensive meat, fruits and vegetables. In the study conducted by Palwasha, Ali, Khan, Andaleeb and Khan (2011), they demonstrated that food consumption pattern is changed by different variables such as price of food item, income of individual, high population and preferences of consumers. In addition, they stated that, when pregnant women are more educated or with the advancement in the education, in general especially in health education they are trying to shift from less nutrient diet to more nutrient diet. Previous research regarding to the purchasing behavior and consumption pattern were explored from abroad based on pregnant women age and living arrangement (Morse & Driskel 2009).

Besides the personal factors, study by Blanchette and Brug (2005) showed that environmental attributes are contributing factors for fruits and vegetables consumption. Availability and accessibility, social condition, as well as cultural condition including financial situation are the determinants for fruits and vegetables consumption (Engelhaupt, 2006). Some researchers found that when a pregnant woman consumes Mediterranean diet such as those coming from countries like Spain, Italy, Turkey, Egypt, Syria and Croatia, she consumes more fruits and vegetables than those who consume conventional Western diet (Dillon 2011).

Eating a balanced and adequate diet has beneficial effects to both the pregnant women and the unborn child. Generally, pregnant women who are malnourished are prone to anemia, infections and poor quality of life, which could give rise to death during pregnancy or child birth; such women may even experience premature delivery (Ezeama and Ezeamah 2014).

Fruit and vegetable intake is inversely related to socioeconomic all over the world. This has led to specific recommendations to increase consumption in low-income sectors of the population to help redress socioeconomic inequalities in health (Acheson 1998). Efforts to increase consumption depend on understanding the factors determining intake. Eating fruit and vegetables is influenced by processes at a number of levels, from cultural norms and

habits; through practical issues of food distribution and accessibility and family and social influences; to individual characteristics such as habits, preferences, and attitudes. Research on psychological factors has focused more on fat consumption than on fruit and vegetables. Nevertheless, a number of social and cognitive factors have been associated with fruit and vegetable consumption in adults, including social participation and perceived social support (Havas et al, 1998), barriers to consumption and perceived health and non health benefits (Anderson, Winett and Wojcik 2000), and self-efficacy (Havas et al, 1998). These associations have been observed both in cross -sectional and intervention studies, where changes in social cognitive variables have correlated with changes in reported fruit and vegetable consumption (Kristal, Glanz, Tilley and Li 2000). There is a substantial body of evidence documenting relationships between stage of change and fruit and vegetable intake and between stage of change and attitudinal factors (Brug, Hospers, and Kok 1997). Nutrition knowledge has shown an inconsistent association with fruit and vegetable intake that is due in part to the use of unreliable and un-validated measures of knowledge. Wardle, Parmenter, and Waller (2000) have shown that knowledge assessed with a validated instrument is associated with intake and is a partial mediator of socioeconomic differences in fruit and vegetable consumption.

2.11 Frequency of Fruit Consumption among Pregnant Women

A study conducted in 2013 by Iwona et al revealed that pregnant women with a higher education level consumed, on average, the lowest amounts of fruit daily (301 g/daily). The highest consumption of fruit on the average (404g/daily) was recorded among the women with elementary education.

A study carried out by Sarah, Santiago, Grace and Kelly (2013) revealed that only a third of women reported eating fruit seven (7) or more times a week and all women reported eating fresh fruit during their pregnancies. Bananas were the most commonly eaten fruit (95.4%), followed by oranges (88.8%), and apples (88.3%). Women also reported eating other fruits such as strawberries, pears, watermelon, and grapes. Two thirds (65.8%) of women ate fruit at least four times a week. Although the majority of women (77%) reported consuming fruit during all three trimesters of their pregnancies, only a third of the women (31.1%) ate the recommended amount of more than one serving of fruit per day. Also a total of 94.9% of women reported drinking juice during their pregnancies. Orange juice was the most commonly consumed juice (76.8%) followed by apple juice (69.1%), juice blends (41.2%)

and other juices (12.9%) such as cranberry or pineapple juice. Most women (85.5%) reported drinking juice at least once per week, and over two thirds (68%) reported drinking juice throughout their pregnancies.

In spite of the abundance of African indigenous and traditional fruits and leafy vegetables, they remain under-exploited and under-utilized by the pregnant women due to various constraints (Opabode and Adegbooye 2005). A significant number of these fruits and vegetables are not consumed particularly by the younger generation of Africans pregnant women because of their unfamiliar tastes or ignorance of how to prepare them (Okeno, Chebet, and Mathenge 2003). Perhaps a crucial component of the fruits and leafy vegetable promotion strategy should be their re-introduction into the daily food habits of the peri-urban and urban populations in particular through recipes developed to show traditional and modernized ways of preparing these under-utilized food ingredients. The recipes should encourage the use of the fruits and vegetables in preparing foods other than accompanying sauces in order to ensure that the vegetables are used at least twice daily, thus increasing the opportunities for their consumption.

It is generally believed that the introduction of exotic fruit and vegetable varieties contributed to the decline in the production and consumption of indigenous vegetables. However, literature reports of a steady decline in dietary intakes of these vegetables with the emergence of simplified diets are based on the assumption of declining use as a result of declining availability (Okeno, Chebet, and Mathenge 2003). Ruel *et al* (2004) also reported that fruit and vegetable consumption of these vegetables sub-Saharan Africa although in this study the reported common vegetables "included onions, carrots, tomatoes and cabbage" vegetables which are really not representative of African Leafy Vegetables .

2.12 Barriers to Adequate Fruit Consumption during Pregnancy

Every social group in the world has unique traditional cultural practices and beliefs, some of which are beneficial while others are not. For instance, there are taboos that emphasize food restriction and also traditional practices, which negatively affect the well being of women during pregnancy and childbirth. This type of cultural practice, especially food taboos, to a large extent, prevents pregnant women in the developing countries from getting adequate food nutrients to sustain mother and child. Excessive restriction, of women from eating food items like proteins, green vegetables can predispose to maternal malnutrition and having low birth weight babies (Guarino, 1997). Unsatisfactory maternal nutrition has been reported to

result from inadequate dietary intakes during pregnancy which have been attributed to ignorance and superstition. It was obvious that most of the women avoided the **c**onsumption of some fruits and vegetables because of the lack of basic information on the nutritional benefits of such commodities (Ademuyiwa and Sanni, 2013).

A study conducted by Mathilda, Banwat, Luret, Jonathan, Sunday and Samuel (2012) on Knowledge and Intake of Fruit and Vegetables Consumption among pregnant women in an Urban Community in North Central Nigeria revealed that the major factors noted to limit vegetable and fruit intake included being unsure of the source of the food items (88.0%) and availability of the food items (96.2%) this proportion is much less than that for knowledge (which was fair in about 92.4% of respondents) and shows that knowledge alone cannot ensure adequate practice of a health activity. Also factors noted in the study to affect fruit and vegetable consumption majorly included cost of the food item and consumes adequate portions of fruits and vegetables seasonal availability of the items. Another study revealed that the level of knowledge was much 39% with nutritional value of fruits and vegetables. Another research conducted by Hart, Azubuike and Barimalain (2005) also found these to be the two main deterrents mentioned by study subjects to limit adequate consumption. However, other studies show that despite being in season and therefore being cheap and available, many pregnant women still do not eat them.

Barriers to accessing fresh vegetables and fruit are complex and include income, education, age, geographic location, affordability, availability, quality, insufficient transportation, and gaps in food skills including preparation, handling and storage (Public Health Law Canter 2012).

Low consumption of vegetables and fruit (less than 5 servings per day) is associated with lower income, and unhealthy behaviours such as cigarette smoking, a diet high in fat, and high levels of television viewing (Conference Board of Canada, 2013). Common reasons for not consuming vegetables and fruit are ‘it takes too much time to prepare vegetables and fruit’, ‘vegetables and fruit are not readily available at home or at work’, ‘vegetables and fruit spoil too quickly’, ‘vegetables and fruit cost too much’, ‘it is too difficult to eat the recommended amount’, and individuals ‘don’t like the taste of many vegetables and fruit’ (Region of Peel, 2008).

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2.13 Conceptual Framework Of Precede Model

Conceptual frame work of "PRECEDE for Knowledge, Attitude and Consumption pattern of fruits among pregnant women.

The acronym "**PRECEDE**" stands for predisposing, Reinforcing and Enabling factors. The model was developed by Green, Kreuter, Partridge and others. It is an important conceptual framework in health education, planning aimed at diagnosing the health problems of a community, understanding the factors that influence the people's behaviour and developing intervention to promote healthy behavior or change such behavior to positive ones (Green and Kreuter, 1999). The model consists of three antecedent factors name which are; predisposing, reinforcing and enabling factors that influence human behavior positively or negatively.

The conceptual frame work are designed and adopted for use as they allow viewers to instantly visualize and grabs relationship. The model will be applied to the knowledge of pregnant women on fruit consumption during pregnancy.

2.13.1 Predisposing factors

The predisposing factors are behavioural antecedent factors that motivate or provide a reason for behaviour. These are factors which must be present before a decision can take place about behaviour. They include Knowledge, readiness to change, Awareness, Attitude, perceptions and belief of pregnant women towards fruit consumption. Knowledge as a factor will be used in assessing what the pregnant women knows about the importance of fruit in their diet. On the other hand, the attitude of the pregnant women towards fruits will be assessed either positive or negative and the level of their willingness and readiness to change.

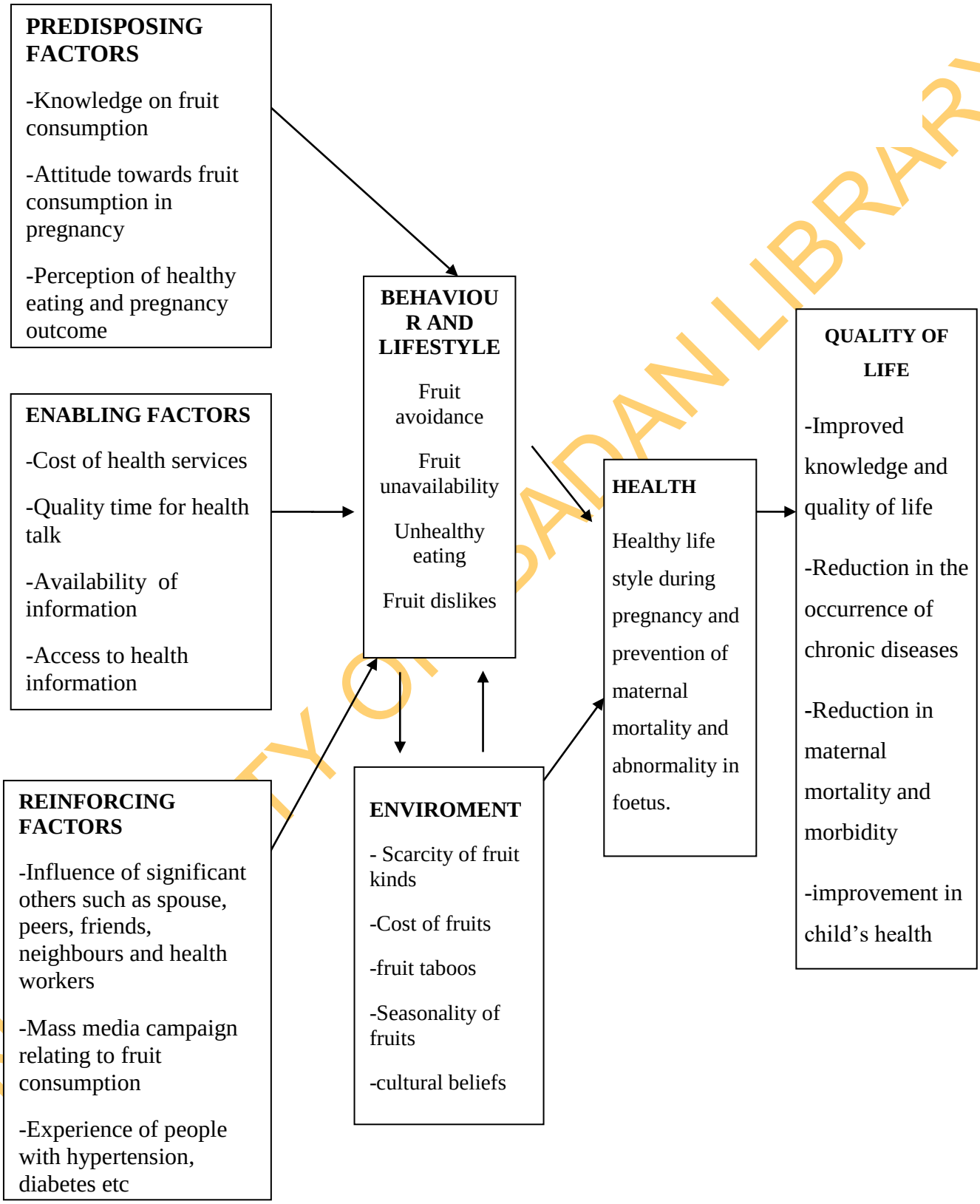
2.13.2 Enabling factors

These are factors that make any health related behaviour more or less likely to occur. These are factors which are presented before the behavioural decision takes place. These factors include cost of seeking health, flexibility, availability and accessibility of nutritional information to pregnant women. Availability of fruit kind, cost of fruits,

2.13.3 Reinforcing factors

These are factors related to the influence of significant others such as influence of friends, Spouse, Mass media (News paper and magazine), family members, peer group, health worker and superior in work place/boss. These factors can influence the knowledge that pregnant women have towards fruit consumption during pregnancy.

Table 2.2: Application of PRECEDE Model to knowledge and attitude of pregnant women towards fruit consumption during pregnancy



(Green, Kreuter 1999)

CHAPTER THREE

METHODOLOGY

3.1 Study Design

The study was a descriptive cross-sectional survey. It explored the knowledge, attitude and consumption pattern of fruits among pregnant women in Ido LGA, Oyo State.

3.2 Study Variables

Independent Variable: The independent variable in the study includes the socio-demographic characteristic of the study population such as age, marital status, level of education, religion, ethnicity and income.

Dependent Variable: The dependent variables on the other hand are knowledge, attitude and frequency of fruit consumption among pregnant women in Ido LGA, Oyo State.

3.3 Description of Study Area

The study was carried out in Ido Local Government Area (ILGA). Ido LGA was created in May 1989 and it was carved out of the former Akinyele Local Government Area with its headquarters in Ido along the Ibadan-Eruwa road. The area was referred to as Akinyele west LGA during the second republic before it was merged again with Akinyele LGA by Buhari and Idiagbion regime in 1987.

Ido Local Government Area shares boundaries with Oluyole, Ibarapa East, Akinyele, Afijo, Ibadan North, Ibadan North West and Ibadan South West Local Governments in Oyo State and Odeda Local Government in Ogun State. Most roads in Ido LGA were not tarred and it is majorly accessible through motorcycle to reach many of the inner parts of the community.

Farming is the occupation of the inhabitants. It also gained from industrialization process from industries like Nigeria Wire and Cable Ltd., Nigeria Mining Corporation and Nigeria National Petroleum Corporation Depot in Apata. It has sixty- eight primary schools and eight secondary schools, six maternity Centers, twenty health Centres and four Customary Courts. The Population of Ido Local Government Area is about 103,261 (Source: Town Planning Division; Ido Local Government, Ido, Oyo State).

On the account of extensive fertile soil located in Ido Local Government, which is suitable for agriculture, the basic occupation of the people is farming. There are large hectares of grassland which are suitable for animal rearing, vast forest reserves and rivers. People in the area grow varieties of edible fruits such as Banana, Mango, Pawpaw, Pineapple, Orange, Walnut, and lot of other fruits. The area is also suitable for a wide range of cash crops like cocoa, kola nut, palm oil, timber and food crops such as maize and rice. In fact, Ido Local Government can serve as the "food basket of the state" if well utilized.

In Ido Local Government Area of Oyo State, there is no major historical record of any forbidden foods and fruits consumption during pregnancy except from some minor taboo on some fruits such as guava, dika fruits, *iyeye* which are forbidden because they believe that it causes delay in delivery and sunken frontanelle as opposed to some areas.

3.4 Study Site

The study was conducted in selected communities within Ido Local Government Area, Oyo State, Nigeria. (See table 3.2)

3.5 Study Population

The study focused on pregnant women in selected communities in Ido Local Government Area, Oyo state, Nigeria.

3.6 Inclusion Criteria

All the respondents who were pregnant at the time of the survey and were willing to participate in the study, also the respondents who were currently residing within the selected communities and pregnant were recruited into the study.

3.7 Exclusion criteria

Respondents whose informed consent was not obtained were excluded from the study. Also respondents who are not pregnant as at the time of this survey were also excluded from the study.

3.8 Sample Size Determination

In order to obtain a good presentation from the population, prevalence (p) of fruit consumption (Cucumber) among pregnant women from a previous study was used.

According to the study, the prevalence of Cucumber consumption was 4% (Ademuyiwa et al 2013). Therefore, the sample size (n) will be calculated by using Lelie Kish's sample size determination formula:

$$N = \frac{Z^2 p(1-p)}{d^2}$$

n = minimum sample size required

Z = The standard normal deviation set at 1.96 (which correspond to the 95% confidence interval).

P = (4% Ademuyiwa et al 2013).

D = the degree of accuracy set at 0.04

$$N = \frac{1.96^2 \text{ x}0.04\text{x}0.96}{0.04^2} = 92.2$$

Adjusting for anticipated 10% non response rate;

$$10\% \text{ of } 92.2 = \frac{92.2 \text{ x}10.}{100} = 9.22$$

This will be added to sample size calculated to make 102. In order to address any possible case of attrition or incomplete response and increase the generalized of the data collected, the sample size will be increased to 120.

3.9 Sampling Technique

A three-stage sampling technique was used to select respondents for the study and this is stated as follows:

Stage1: Five wards were randomly selected from the existing ten wards in the local government**.** (See table 3.1 below for the list of the wards)

Stage 2: Out of the five wards, four communities each were selected using a balloting method to select twenty communities within Ido Local Government Area. (See table 3.2 below for the list of the communities)

Stage 3: Snow balling sampling technique was then used to select six consenting respondents from each of the communities selected because the community members were reluctant to identify pregnant women for interview.

Table 3.1: List of wards in Ido Local Government Area (ILGA)

S/N	Wards	Communities
1	Itaju	Elewele, Elebe akilo, Abimba, Ajiboro. Akinsola, Gbada, Gbagbe,Akinpelu, Adesiyan
2	Akufo	Elegunde, Oyawo, Abudu, Owoteru, Ajanbata, Adani oniesu, Laminu, Ikanmodi, Idiroko, Opawale, Aba nla, Onikoko, Akinlade, Ajayi, Ikanmodi.
3	Akinware	Aba oke, Babare, Oyagbe, Adewale, Akindele, Abidogun, Morakinyo, Akande, Akinteye, Ogunleye, Oni koko
4	Apete	Onigba ketun, Araromi, Alapata, Onigodogi, Agbopa, Ologbo, Lakanpo, Ekerin, Bale, Abanla, Ile tuntun, Ayigoro, Lapade, Alere, Odebode.
5	Idiya	Oyetunde, Ilaju, Aba bende, Abulekau, Olowa, Batake, Adegbite, Laduni oni sango, Adejare, Aba sina, Alaraba, Okedina, Idi iroko, Ile tuntun, Aba paanu.
6	Erinwusi	Akore-latunji, Oyekan keji, Okose, Adeniyi ogunleye, Idiogun, Idijo, Langbin, Onifade, Faleti, Akinbiyi, Olokoti, Abafa, Erinwusi, Kusela
7	Gbekuba	Eleko, Kuye, Aranse, Ogeroju, Alafara, Idi oro elewa, Ogala, Amu gbekuba, Abesin, Apena, Olose, Omi, Baba sango.
8	Ido	Igbona, Olora, Jagun, Oko, Agbopa, Ogunwehinde, Oderemi, Oloro, Omi, Bada, Papa ige, Ogunleye, Olojede, Akinbiyi, Abafa, Asiwaju kiabi, Bunmileyi
9	Omi-adio	Oyedina, Alawo esin,Ajao, Oseni, Alakaso, Eleso, Bakatare, Omi, Aremu, Adeyemo, Apoyin, Tade ege, Abidogun, Bode gbo, Alawo esin, Erin kojagbe, NNPC, Balogun, Aladeowo,Omowunmi
10	Ogundele Alawo	Badipe, Ijaiye, Omiyolo, Ojo, Isola, Onidoko anisere oloya, Adebayo, Olowo osomekun, Alapada, Alamo, Ajabe, Abiola, Ojoegba, Okukanmi siba, Olugbesan, Dagilogba, Elere, Agaloke, Agbada, Aba paanu, Aba-ayinde, Oloyo oso, Ilori, Onigbogi,Obosokoto, Larin, Mekun

Table 3.2: List of wards and communities selected.

Wards	Name of communities.
Ward Four (Apete)	Alapata Ekerin Agbopa Apete Central
Ward Five (Idiya)	Abapaanu Abule kau Laduni onisango Idiya
Ward Eight (Ido)	Oloro Ogunwehinde Akinbiyi Asiwaju kiabi
Ward Nine (Omi)	Abidogun Bakatare NNPC Alakaso
Ward Ten (Ogundele Alawo)	Oloyo Elere Adebayo Aba-Ayinde

3.10. Instrument for Data Collection

Quantitative (interviewer-administered and semi-structured questionnaire) instrument was developed for data collection. The questionnaire consists of four sections; A, B, C and D. Section A consists of questions to identify the socio-demographic characteristics of the respondents (pregnant women). Section B consists of questions to assess the knowledge of respondents on fruit consumption. Section C consists of questions to assess the attitude of pregnant women towards fruit consumption. Section D consists of questions to determine the frequency of fruit consumption in the last one week preceding the survey. The questionnaire included both closed and open-ended questions.

3.11 Validity of the Instrument

In order to ensure validity and reliability of the study instrument for data collection, several steps were considered. Firstly, relevant research literatures were consulted in developing the instrument. Secondly, the instrument was reviewed by peers, lecturers, experienced researchers and supervisor and necessary corrections were made. Thirdly, three research assistants were trained for two days to conduct the main data collection. Fourthly, pre-testing of the instrument was done using Aba-alamu, 7-up and sharp corner (Oluyole) in Ibadan South West LGA.

The pre-test exercise served as a pilot study for the data collection procedures. It helped in the validity of the instrument and in determining some challenges which needed to be overcome before the main data collection process. The pre-test enabled the researcher to determine the trend in the responses of participants, their level of understanding of the items in the research instruments and the duration of time it will take to administer the instruments.

3.12 Reliability of the Instrument

Reliability was ensured through translation of instrument into Yoruba language and back into English language. More so, the internal consistency (reliability) was determined using the Cronbach's Alpha statistics. This was done by administering the questionnaire to 10% of the study size at the site chosen for the pre-test, after which the coefficient reliability was calculated using SPSS computer software. A reliability coefficient of 0.7 was obtained, higher than the average correlation coefficient of 0.5. The result showed that the instrument was reliable.

3.13 Training of Research Assistants

Three research assistants were recruited for the study. Educational qualification of the assistants was at least Ordinary National Diploma (OND), BSc, and MSc. They are fluent in English and Yoruba Language. The research assistance were trained for two days. A time table was drawn for these periods. The training commence with introduction of the trainer or the principal investigator and trainees, followed by the background of the study and objectives. Contents of the training focussed on interview techniques, interpersonal and communication skills. Demonstrations were used to transfer skills after which the trainees were equipped with copy of the instrument each to be taken home and read over for better

understanding with aim of answering any burning question that may result the following day.

3.14 Data Collection Method

Three (3) trained research assistants helped in the administration of the questionnaire in the selected communities. All the research assistants already had experience in field data collection and were trained on data collection. The data collection process was carried out in two weeks, September 1st – September 14th 2014.

The questionnaires were administered only to the target respondents. Prior to the administration of the questionnaires, respondents were provided with some information about the study. This included information relating to the nature of the study objectives, selection process of respondents, time-frame for the interview and issues about confidentiality of responses. Only the pregnant women who gave their consent verbally were interviewed using the set of questionnaire. The researcher made provision for interviewer-administered questionnaire in the local language (Yoruba) ensuring that the wordings of the questions contained in the questionnaires was easy to comprehend, and help was given to the respondents with difficulties where necessary.

3.15 Data Management

After administering the interviewer-administered questionnaire, manual editing was carried out to check for completeness, consistency and accuracy of information collected. Serial numbering of questionnaires and storing each days questionnaire into a safe box. 120 completed questionnaires were collected at the end of the exercise.

3.16 Data Analysis

A coding guide was developed and used for coding the answered questionnaires. Data were fed into the computer using the Statistical Package for Social Sciences (SPSS) software version 16.0. In order to determine the knowledge, attitude and frequency of fruit consumption among the respondents. A scoring mechanism was also adopted.

All the 120 questionnaires administered were used for analysis. In respect to analysis, knowledge scores of $\leq$8, >8-18 and >18 were categorised as poor, fair and good respectively and attitude scores of $\leq$4 and >4 were classified as negative and positive respectively. In

addition, the hypotheses were tested to establish different level of significant relationships between variables. Data were analysed using descriptive statistics, Chi-square and logistic regression tests at 0.05 level of significant. The hypotheses were tested using chi-square.

3.17 Ethical Considerations

Ethical approval obtained from the Oyo State Research Ethical Review Committee, Ministry of Health and permission from the community head before going into the communities for the study. Informed consent was obtained from the family head (if present at the time of arrival), before interviewing their wives and assent was gotten from the respondent (pregnant women) that participated in the study. Participation of the pregnant women was voluntary. The research did not cause any form of harm to the respondent and it was conducted at a time that was convenient for them, not affecting their duties and businesses. Confidentiality of the information given from the respondents was ensured. Serial numbers were written on each questionnaire and no names were required from the participants.

CHAPTER FOUR

RESULTS

The findings of this study are presented in this section. They are organized into the following sub-section: socio- demographic characteristics, knowledge of pregnant women on fruit consumption, the attitude towards fruit consumption during pregnancy, the frequency of fruit consumption among pregnant women and the barriers affecting adequate consumption of fruits during pregnancy with suggestions.

4.1: Socio- Demographic characteristics of respondents.

A completion response rate of 100% (120 out of 120) was obtained with the questionnaire among pregnant women in Ido local government area of Oyo state. (Table 4.1) shows the socio-demographic characteristics of the respondents. The ages of the respondents ranged from 19 to 38 years with a mean of 28.6 ± 4.4 respectively. The minimum age is 19 while the maximum age is 38. Among the 120 respondents 19 (15.8%) were in 19-23 years age range, (31.7%) were in 24-28 years age range, (35.8%) were in 29-33 years age range while (16.7%) were in the 34-38 years age range. As shown in figure 2 below. A Majority (98.3%) of the respondents were married and (1.7%) were pregnant but never married. The distribution of respondents by religion showed that slightly over average of the number of the respondents, (60.8%) were Christians, (39.2%) were Muslims as shown in the table below.

The distribution of the respondents by ethnic group showed that the majority of the respondents (81.7%) were Yoruba followed by Igbo (12.5%). The educational qualification of the respondents in this study showed that (2.5%) had primary education. Majority of the respondents, (62.5%) had secondary education, while (35.0%) had tertiary education respectively. The occupation of the respondents showed that the half of the respondents, (50.8%) were traders, followed by the artisan (25.0%), (15.0%) of the total respondents were teachers, (4.2%) were civil servants, (2.5%) were farmers and (2.5%) were Bankers. The educational qualification of the partners of the respondent in this study showed that (1.7%) had primary education, (59.2) had secondary education, (38.3%) had tertiary education while (0.8%) had a Quranic education. As shown in table 4.1 below

The number of children which the respondents had preceding this study ranged from 1 to 5 children. (25.0%) had one child, (33.3%) had two children, (23.3%) had three children, (4.2%) had more than four children. (14.2%) had no child and they were in their first pregnancy. The mean number of children is 2.5 ± 1.3 respectively. It is shown in figure 4.1 below

The income categorisation of the respondents from all sources of their income showed that most of the respondents, 42 representing (35.0%) of the total respondents, earned less than ₦10,000; 38 respondents representing (31.7%) of the total number of the respondents earned between ₦10,001 and ₦20,000; 15 respondents representing (12.5%) of the total number of the respondents earned between ₦20,001 and ₦30, 000 while 12 respondents out of 120 representing (10.0%) earned between ₦30,001 and ₦40,000. (2.5%) earned between ₦40,001 and ₦50,000; 4 of the respondent representing (3.3%) earned between ₦50,001 and ₦60,000 while (2.5%) earned between ₦60,001 and ₦70,000. (0.8%) earned between ₦70,001 and 80,000, (1.7%) earned between ₦80,001 and ₦90,000 respectively. The income categorization of the respondents is shown in figure 4.4.

Table 4.1: Socio- Demographic Characteristics of the respondents "N=120"

Socio demographic	Frequency	Percentage
Age		
19-23 years	19	15.8
24-28 years	38	31.7
29-33 years	43	35.8
34-38 years	20	16.7
Marital status		
Never married	2	1.7
Married	118	98.3
Religion		
Christianity	73	60.8
Islam (Muslim)	47	39.2
Ethnic group		
Yoruba	98	81.7
Hausa	1	0.8
Igbo	15	12.5
Egede	5	4.2
Edo	1	0.8
Educational level		
Primary	3	2.5
Secondary	75	62.5
Tertiary	42	35.0
Occupation		
Trader	61	50.8
Artisan	30	25.0
Teacher	18	15.0
Farmer	3	2.5
Civil servant	5	4.2
Banker	3	2.5
Partners educational level		
Primary	2	1.7
Secondary	71	59.2
Tertiary	46	38.3
Quranic	1	0.8
Partners occupation		
Trader	26	21.7
Artisan	45	37.5
Teacher	9	7.5
Farmer	4	3.3
Civil servant	20	16.7
Driver	6	5.0
Reporter	1	0.8

Private sector	4	3.3
Banker	4	3.3
Cleric	1	0.8
Gestational stage		
First trimester	25	20.8
Second trimester	54	45.0
Third trimester	41	34.2

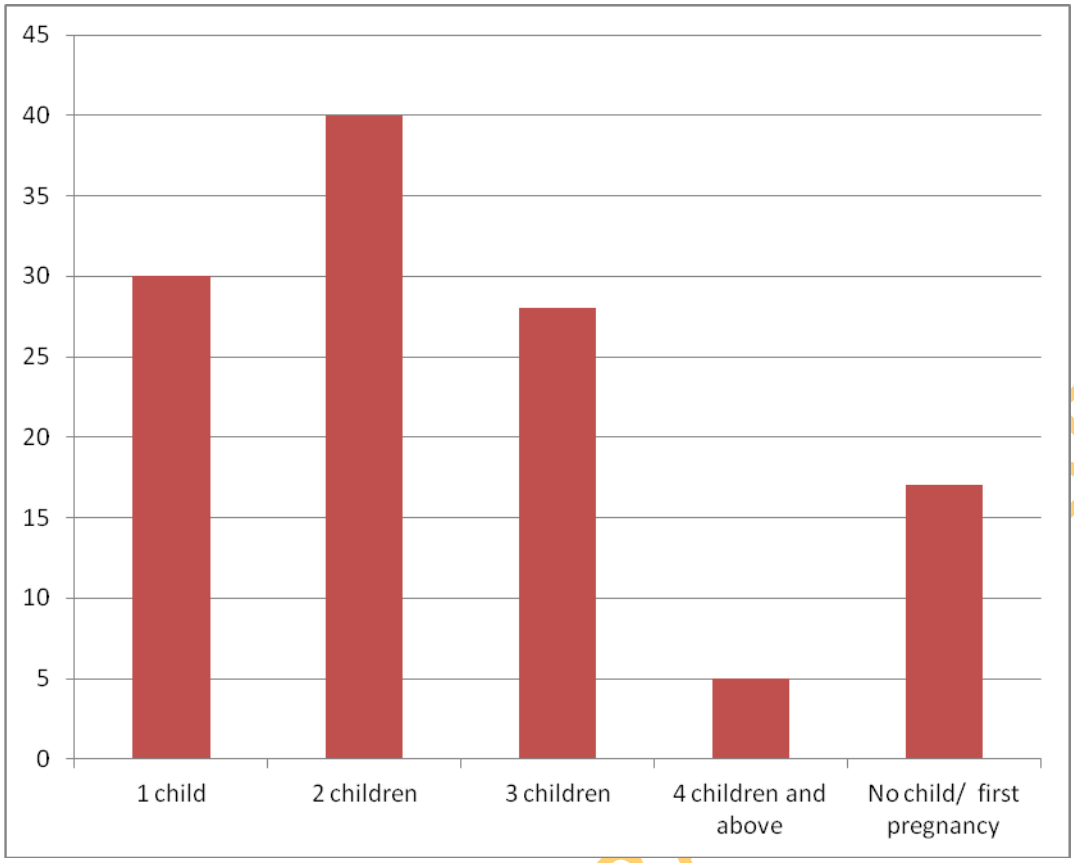


Figure 4.1: Respondent's number of children

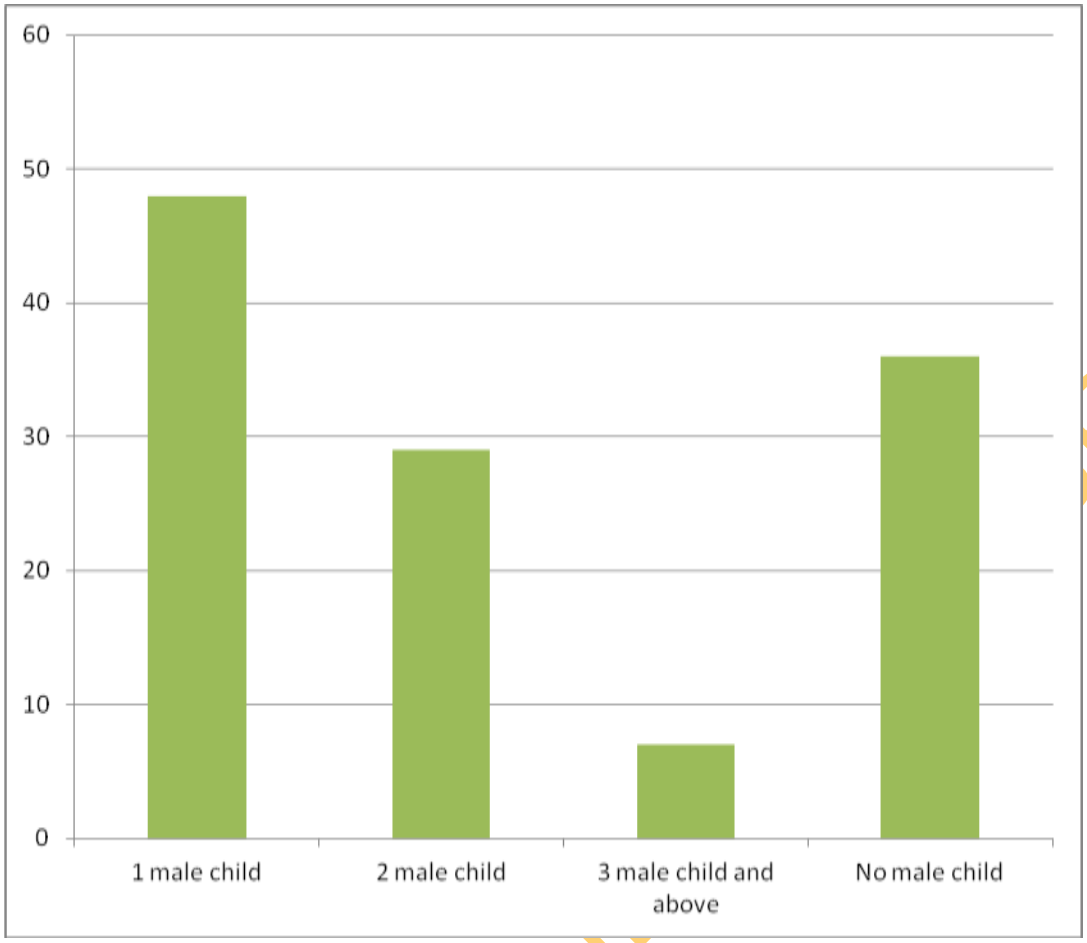


Figure 4.2: Respondent's number of male children.

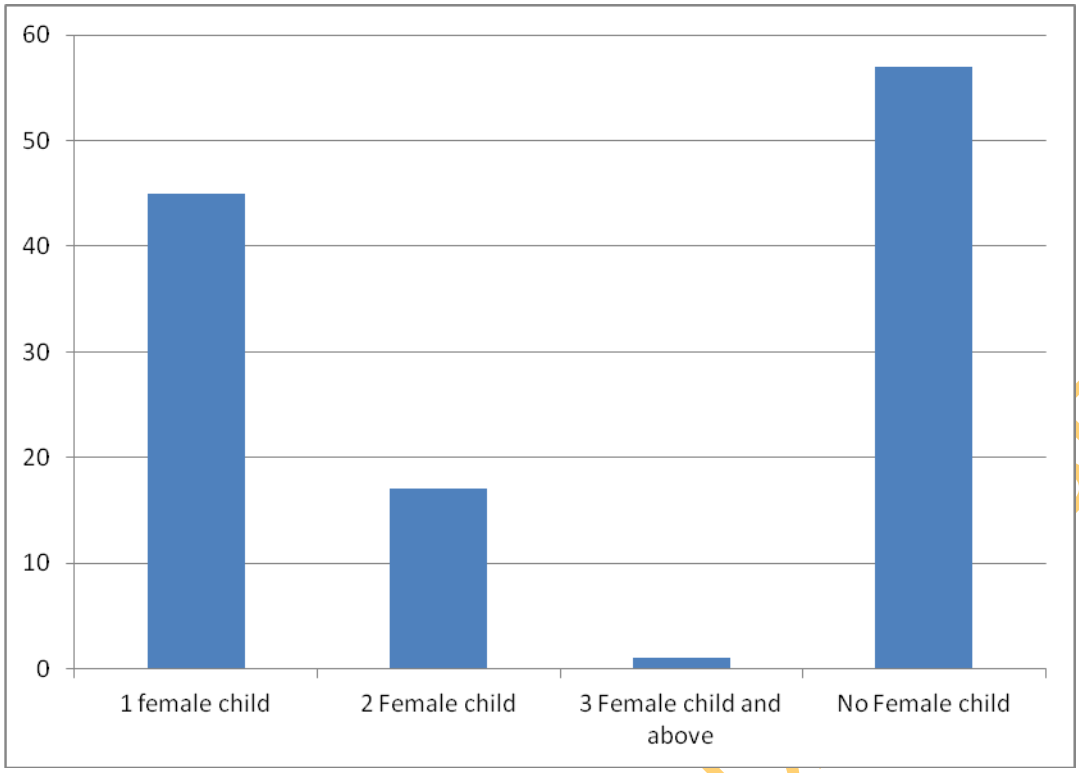


Figure 4.3: Respondent's number of female children.

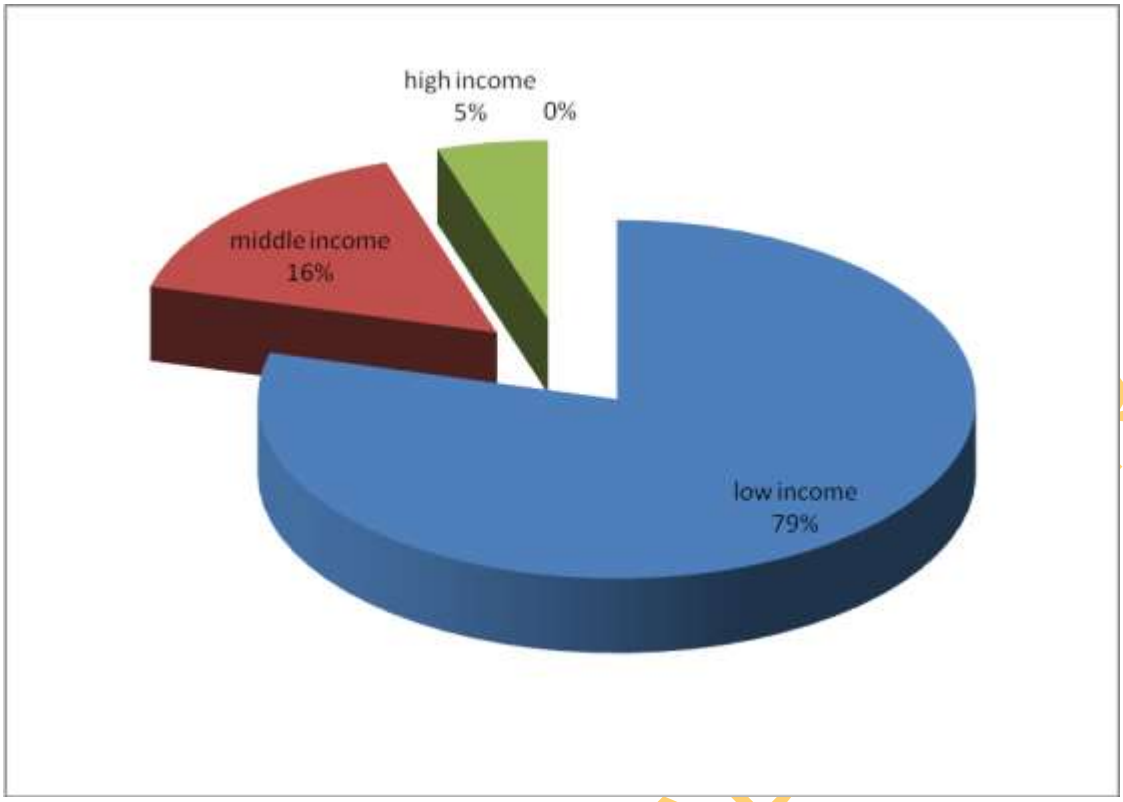


Figure 4.4: Respondent's income

Income levels

≤ ₦30,000	low income
> ₦30,000 - ₦60,000	middle income
> ₦60,000	high income

4.2: Respondents' Knowledge of fruit consumption.

Overall knowledge of the pregnant women on fruit consumption was relatively fair. Over 90% of the respondents knew that fruits are high in calories while (98.3%) were aware that fruits are likewise low in fats. (91.7%) respondents understands that bioactive present in fruits helps in protecting against a number of diseases such as coronary heart disease, hypertension and cancers while (97.55%) adequate fruit consumption during pregnancy provides vitamins which help to form the baby's bones and teeth, heart, ears and immune system (97.55), lack of vitamin A can cause vision problems in babies, is a great way to ensure a healthy baby (94.2%), and fruits helps to reduce the risk of obesity among pregnant women was disagreed by (91.7%). Folic acid in oranges and orange juice helps to prevent neural tube defects (spinal bifida) in infant as disagreed by most of the respondents (85%).

When the respondents were asked based on their understanding if Consumption of fruits helps to reduce the risk of obesity among pregnant women, (91.7%) were unaware while more than half of the respondents (79.2%) understands that fruit is not usually recommended within the first trimester of the pregnancy. Most of the pregnant women (93.3%) know that fruit consumption can lead to healthier lifestyle and reduce the risk of diabetes. (88.3%) does not know that fruit consumption helps to reduce the risk of hypertension, (94.2%) reported that consumption of fruit does not ensures the protection from non-communicable disease (NCD) and all the respondents (100.0%) understood that fruit consumption is beneficial to health, contributing significantly to the physical functioning of the body.

However, knowledge was fairly low in respect of the disease occurrence that can be reduced through fruit consumption such as cardiovascular disease. Diabetes, stroke and obesity among others (as shown Table 4.3 below). Similarly Knowledge was also low for the effect of fruit on Low foetal birth weight, Foetal growth retardation, Risk for maternal mortality and morbidity and Abnormality in the child (as shown in Table 4.4)

In respect to the Importance of fruits in the diet of pregnant women**,** less than half (46.7%) of the respondents believed fruits are important in the diet of pregnant women to while (31.7%) perceived that fruits make can make the baby look fresh and to prevent diseases. (22.5%) respondents understands that fruits provides vitamins which are needed during pregnancy and (20%) perceived that fruits increase blood while very few (2.5%) believed

fruits are important in the diet of pregnant women in order to prevent constipation. (as shown in table 4.3 below).

On whether the consumption of fruit can help to reduce the risk of these diseases, majority of the respondent (70.0%) reported fruit consumption cannot help reduce the risk of having diabetes, obesity (66.7%), cardiovascular diseases (43.3%). Few of the respondents knew the risk of stroke cannot be reduced by consuming fruits (41.7%) and some forms of cancer (32.5%). (48%) knew that fruit consumption can help reduce the risk of having malaria and only (5.0%) perceived that wound can be healed by consuming fruits. (Table 4.4)

On the effect of inadequate consumption of fruit during pregnancy, majority of the respondents (78.3%) reported inadequate fruit consumption during pregnancy cannot causes low foetal birth weight, (74.2%) foetal growth retardation, and abnormalities in the child (54.2%). More than half of the consenting respondents (65.8%) knew inadequate fruit consumption during pregnancy is a risk for maternal anaemia, likewise maternal mortality and morbidity (39.2%) respondents knew fruits helps to increase blood in the body.(as shown in table 4.5)

Overall knowledge of the respondents shows that 71 respondents representing (59.2%) had poor knowledge on fruit, few of the respondents (20.8%) had good knowledge on fruit while (20.0%) had average knowledge on fruit. The mean knowledge score is 20.2± 2.9

Table 4.2: Respondents' knowledge on fruit

STATEMENTS	YES (%)		NO (%)		DON'T KNOW (%)	
Most fruits are high in calories and low in fat and they contain nutrients that help to prevent diseases	118	98.3	0	0.0	2	1.7
The bioactive present in fruits helps in protecting against a number of diseases such as coronary heart diseases, hypertension and cancers	110	91.7	0	0.0	10	8.3
Vitamins in fruits can help to form the baby's bones and teeth, heart, ears and immune system	3	2.5	117	97.5	0	0.0
Lack of vitamin A can cause vision problems in babies	113	94.2	0	0.0	7	5.8
Folic acid in oranges and orange juice helps to prevent Neural tube defects (Spina Bifida) in infant	1	0.8	102	85.0	17	14.2
Fruit consumption during pregnancy is a great way to ensure a healthy baby	119	99.2	1	0.8	0	0.0
Consumption of fruits helps to reduce the risk of obesity among pregnant women	1	0.8	110	91.7	9	7.5
It is usually recommended within the first trimester	25	20.8	95	79.2	0	0.0
Fruits consumption cannot lead to healthier lifestyle	5	4.2	112	93.3	3	2.5
Fruit consumption is beneficial to health, contributing significantly to the physical functioning of the body.	120	100.0	0	0.0	0	0.0
Fruit consumption helps to reduce the risk of hypertension.	5	4.2	106	88.3	9	7.5
Fruit consumption helps to reduce the risk of diabetes among pregnant women	1	0.8	112	93.3	7	5.8
Consumption of fruit ensures the protection from Non communicable disease (NCD)	4	3.3	113	94.2	3	2.5

Table 4.3: Importance of fruit in the diet of pregnant women N= 120

Statement	Frequency	Percentage (%)
Increases blood	24	20.0
Provide vitamins	27	22.5
Prevent diseases	38	31.7
Prevent constipation	3	2.5
Freshens the baby	28	23.3

Table 4.4: The consumption of fruit can help to reduce the risk of these diseases.

Diseases	Yes (%)		No (%)		Don't know (%)	
Cardiovascular disease	17	14.2	52	43.3	51	42.5
Diabetes	13	10.8	84	70.0	23	19.2
Stroke	38	31.7	50	41.7	32	26.7
Some forms of cancer	31	25.8	39	32.5	50	41.7
Obesity	17	14.2	80	66.7	23	19.2
Malaria	57	47.5	48	40.0	15	12.5
Other specify (Wound)	6	5.0	108	90.0	6	5.0

Table 4.5: Effect of inadequate consumption of fruit during pregnancy

Diseases	Yes (%)		No (%)		Don't know (%)	
Maternal anemia	79	65.8	23	19.2	18	15.0
Low foetal birth weight	18	15.0	94	78.3	8	6.7
Foetal growth retardation	17	14.2	89	74.2	14	11.7
Risk for maternal mortality and morbidity	47	39.2	45	37.5	28	23.3
Abnormality in the child	28	23.3	65	54.2	27	22.5

4.3: Respondents' Attitude towards fruit consumption during pregnancy

Attitudinal disposition of respondents towards fruits consumption during pregnancy are presented in table 4.6 below. All the respondents disagree that fruits are not necessary during pregnancy. Less than half 42.5% felt that fruit consumption during pregnancy prevents infant to be still born. Pregnancy usually increases fruit consumption as agreed by ninety percent of the respondents. (7.5%) of the respondents felt that inadequate consumption of fruit during pregnancy will have difficulty during delivery while (97.5%) disagree that fruits are usually forbidden for pregnant women therefore eating different types of fruits are challenging for pregnant women (19.2%). Most of the time health workers do support the consumption of fruits for pregnant women (99.2%) giving health talk during ante natal clinic more so fruit consumption by pregnant women is relatively easier because it can be consumed at work, home, on transit and requires no cooking (95.0%).

Majority of the respondents (90.8%) had a positive attitude towards fruit consumption while few, (9.2%) had a negative attitude towards fruit consumption with a mean attitude score of 5.5±0.9.

Table 4.6: Attitude towards fruit consumption during pregnancy

Diseases	Agree	(%)	Undecided	(%)	Disagree	(%)
It is not necessary to consume fruit while pregnant	0	0.0	0	0.0	120	100
Fruit consumption during pregnancy prevents infant to be still born	51	42.5	47	39.2	22	18.3
Pregnancy usually increases fruit consumption	108	90.0	1	0.8	11	9.2
Women who do not consume adequate fruit during pregnancy will have difficulty during delivery.	9	7.5	32	26.7	79	65.8
It is forbidden for pregnant women to eat fruit	2	1.7	1	0.8	117	97.5
Health workers do support the consumption of fruit for pregnant women	119	99.2	0	0.0	1	0.8
Eating different types of fruits are challenging for pregnant women	23	19.2	11	9.2	86	71.7
Fruit consumption by pregnant women is relatively easier because it can be consumed at work, home, on transit, and requires no cooking.	114	95.0	0	0.0	6	5.0

4.4: Frequency of fruit consumption among pregnant women

It is revealed that higher percentage (94.2%) of the studied pregnant women consumed fruit in a week preceding this survey while (5.8%) never consume fruits within the same period.

On number of times fruits was consumed within the last 7 days, twenty-seven percent of the respondent reported its consumption of fruits two (2) times per week, (25%) and (19.2%) of the respondents consumed fruits 3 and 4 times per week respectively. (18.3%) consumed fruits once a week, (1.7%) consumed fruit five times within a week, (5.8%) did not consume any fruits in the last 7 days preceding the survey. Also from the table, only (2.5%) consumed fruits on a daily basis. Very few ate fruit six times a week (0.8%) (as shown in table 4.7 below).

Pattern of consumption of fruits by the pregnant women is presented in table 4.8. The table shows that high percentage of the respondents (23.7%) consumed orange. Orange is commonly consumed because of it is high in vitamin C content, availability almost all year round and affordability. Also, in this fruit category, part of the commonly consumed fruits are watermelon (14.7%) and pineapple (12%). Banana (11.7%), apple (11.7%), garden egg (10.5%), and paw-paw (8.1%) were averagely consumed. The two least consumed of the fruits on a weekly basis were cucumber (4.5%), and walnut (0.6%).

When the respondents were asked on what motivated them to consume fruits and the major dominant decision on the consumption of these fruits, the overall summary holds that the majority of the respondents (65.8%) consumed more of oranges with the motive that it is good for baby (23.3%) and the dominant decision maker of orange consumption among the respondents is the health worker (28.3%) through health talks at the ante-natal clinic as against the walnut that has the least consumption of (0.6%) due to the cultural believe that it causes sunken frontanelle (*oka ori*) and others believed it causes delay in delivery.

It was revealed that other fruit that was consumed below average when asked from the respondents is Water melon with (40.8%). Out of the 120 respondents, (33.3%) consumed pineapple in the last seven days preceding the survey, the respondents (31.7%) who consumed banana in the last 7 days were motivated because banana is good for baby (16.7%), they were self-motivated (18.3%) and it was consumed twice within a week (15.8%), Apple were consumed by (33.3%) of the respondents, (29.2%) consumed garden

egg, (22.5%) of the respondents reported they consume paw-paw in the last seven days, (29.2%) consumed garden egg because they believed it is good for babies. (15.8%) were influenced by health workers during ante-natal clinic and (10.8%) took garden egg once in the last seven days preceding the study. (9.2%) of the respondents took cucumber because it prevent diseases in the new born.

The major motivating and influencing factors for those that consumed fruits below average were individual and husbands and they commonly believed it is good for the body. Unfortunately none of the respondents consumed pea, grape and mango in the last one week preceding the survey.

Table 4.7: Frequency of fruits consumption within the last 7 days preceding the survey

	Frequency	Percentage (%)
One time	22	18.3
Two times	32	26.7
Three times	30	25.0
Four times	23	19.2
Five times	2	1.7
Six times	1	0.8
Seven/ Every day	3	2.5
Not at all	7	5.8
Total	120	100.0

Table 4.8: Fruits consumption in the last 7 days

	Frequency	Percentage (%)
Orange		
Yes	79	65.8
No	41	34.2
Water Melon		
Yes	49	40.8
No	71	59.2
Apple		
Yes	40	33.3
No	80	66.7
Pineapple		
Yes	40	33.3
No	80	66.7
Banana		
Yes	39	31.7
No	81	68.3
Garden Egg		
Yes	35	29.2
No	85	70.8
Paw-paw		
Yes	27	22.5
No	93	77.5
Cucumber		
Yes	15	12.5
No	105	87.5
Walnut		
Yes	2	1.7
No	118	98.3

4.5: Barriers affecting adequate fruit consumption during pregnancy

Inadequate knowledge on the importance of fruits, Seasonal fluctuations of fruits, perishability of fruits and non- availability of fruit kinds were identified by majority of the respondents as barriers that influence adequate consumption of fruits during pregnancy. Out of the 120 consenting respondents, more than half of the respondent (67.5%) reported inadequate nutritional knowledge on the importance of fruit as a major barrier which hinder fruit consumption. (64.2%) reported seasonal fluctuation of fruits to a large extent hinders adequate consumption of fruits when preferred fruit kinds are out of season. Fifty-six percent agreed that fruits are highly perishable thereby discouraging the pregnant women from buying more than what they can consume within the shortest time. More so, non availability of fruit kind as reported by less than half of the respondents (45%) is also a major barrier to adequate fruit consumption during pregnancy. On the other hand, cultural belief (97.5%) religious beliefs (97.5%) as reported by the respondents have little or no effects inhibiting adequate fruit consumption during pregnancy. Also cost (63.3%) as fruits are relatively cheap and affordable, storage difficulty (58.3%), lack of interest (56.7%) and likes and dislikes of the household respectively among which have little or no impact as a barrier to adequate fruit consumption pattern during pregnancy.

It was reported from the respondents that some fruits were avoided during pregnancy which amounts to some form of barriers in fruits consumption. Out of the 120 consenting respondents few (26.1%) reported they would avoid fruits such as cucumber and walnut respectively. This could be as a result of lack of basic nutritional importance of cucumber and walnut. (17.4%) avoid grape consumption; thirteen percent avoid the consumption of dika fruit (*oro*) and guava respectively during this pregnancy. Only (4.3%) avoid the consumption of pineapple during pregnancy.

Likewise when it was inquire from the respondent the **r**easons for fruit avoidance, it was revealed that (5%) of the consenting respondent reported fruit avoidance as a result of fruits dislike, fruit taste of some kinds of fruits especially when their fruit kind is not available or out of season (2.9%), (1.2%) avoids fruits such as guava because of its seed and delay in delivery respectively. Only (0.4%) avoid fruit because it causes sunken frontanelle for the baby.

Other factors militating against adequate fruit consumption are fruit taboos. Out of the 120 consenting respondents only (7.5%) reported fruits taboos which hinders them from consuming fruit during pregnancy. These taboo fruits are: dika fruit (4.2%), walnut (1.7%), guava and *iyey*e (0.8%) respectively.

Table 4.9: Barriers affecting adequate fruit consumption during pregnancy

STATEMENTS	To a large extent (%)		To small extent (%)		Not at all (%)	
Inadequate nutritional knowledge on the importance of fruits	81	67.5	28	23.3	11	9.2
Seasonal fluctuation of fruits	77	64.2	34	28.3	9	7.5
Fruits are highly perishable	67	55.8	47	39.2	6	5.0
Non availability of fruit kind	54	45.0	55	45.8	11	9.2
Storage difficulty	29	24.2	70	58.3	21	217.5
Likes and dislike of the household	15	12.5	68	56.7	37	30.8
Lack of interest	10	8.3	33	27.5	77	64.2
Cultural beliefs about fruit	3	2.5	0	0.0	117	97.5
Cost	42	35.0	76	63.3	2	1.7
Religious beliefs	1	0.8	117	97.5	2	1.7

4.6: Test of Hypotheses

4.6:1: Hypothesis one

The first hypothesis stated that there is no association between the respondents' age and the knowledge of fruit consumption. In order to verify the respondents' age and knowledge of fruit consumption, cross-tabulation of the variables were done. Table 4.12 below shows that age has nothing to do with their knowledge. The statistical test shows a p-value of 0.463. This suggests there is no association between age of respondents and knowledge of fruit consumption. This shows that, the knowledge of pregnant women on fruit consumption is not dependent on their age. The null hypothesis was therefore accepted.

Table 4.10: Association between respondents' age and their knowledge on fruit consumption

(N = 120)

		Knowledge of respondents		
		Poor	Fair	Good
Age	19-23	12 (16.9%)	6 (25.0%)	1 (4.0%)
	24-28	24 (33.8%)	7 (29.2%)	7 (28.0%)
	29-33	25 (35.2%)	7 (29.2%)	11 (44.0%)
	34-38	10 (14.1%)	4 (16.7%)	6 (24.0%)

$\mathbf{X^2}$ = 5.653, **p**= 0.463, **df** = 6

4.6.2: Hypothesis Two

The second hypothesis stated that there is no association between the respondents' level of education and the knowledge of fruit consumption. In order to verify the respondents' level of education and knowledge of fruit consumption, cross-tabulation of the variables were done. The statistical test shows a p-value of 0.004. Respondents with tertiary education were five times more likely to have a good knowledge about fruit consumption than respondents with secondary and primary education this suggests an association between respondents' educational level and knowledge of fruit consumption. The null hypothesis was therefore rejected.

Table 4.11: Association between level of education of respondents' and their knowledge on fruit consumption

(N = 120)

		Knowledge of respondents		
		Poor	Fair	Good
Respondents' level of education	Primary Education	2 (2.8%)	0(0.0%)	1 (4.0%)
	Secondary Education	54 (76.1%)	11 (45.8%)	10 (40.0%)
	Tertiary Education	15 (12.1%)	13 (54.2%)	14 (56.0%)

$\mathbf{X^2}$ = 15.606, **p**= 0.004, **df** = 4

4.6.3: Hypothesis three

The third hypothesis stated that there is no association between respondents' knowledge and frequency of fruit consumption. In order to verify the respondents' knowledge and frequency of fruit consumption, cross-tabulation of the variables were done. The statistical test shows a p-value of 0.168 (Table 4.14). This suggests that there is no association between respondent's knowledge and frequency of fruit consumption. The null hypothesis was therefore accepted.

Table 4.12: Association between respondents' knowledge and frequency of fruit consumption

(N = 120)

		Frequency of fruit consumption	
		Low consumption	High consumption
Respondents' knowledge	Poor	58 (63.7%)	13 (44.8%)
	Fair	17 (18.7%)	7 (24.1%)
	Good	16 (17.6%)	9 (31.0%)

X^2 = 3.567, **p**= 0.168, **df** = 2

4.6.4: Hypothesis four

The fourth hypothesis stated that there is no association between the respondents' level of education and frequency of fruit consumption. In order to verify the respondents' level of education and frequency of fruit consumption, cross-tabulation of the variables were done. The statistical test shows a p-value of 0.000. Respondents with secondary education were more likely to have low consumption pattern of fruits compared with respondents with tertiary education this suggests an association between respondents' educational level and knowledge of fruit consumption. The null hypothesis was therefore rejected.

Table 4.13: Association between respondents' level of education and frequency of fruit consumption

(N = 120)

		Frequency of fruit consumption	
		Low consumption	High consumption
Respondents' level of education	Primary	3 (3.3%)	0 (0.0%)
	Secondary	67 (73.6%)	8 (27.6%)
	Tertiary	21 (23.1%)	21 (12.4%)

$\mathbf{X^2}$ = 23.709, **p**= 0.000, **df** = 2

4.6.5: Hypothesis five

The fifth hypothesis stated that there is no association between the respondents' income and frequency of fruit consumption. In order to verify the respondents' income and frequency of consumption, cross-tabulation of the variables were done (Table 4.16). The statistical test shows a p-value of 0.000. This suggests that there is an association between respondents' income and frequency of fruit consumption. The null hypothesis was therefore rejected.

Table 4.14: Association between respondents' income and frequency of fruit consumption

(N = 120)

		Frequency of fruit consumption	
		Low consumption	High consumption
Respondents' income	Low income	78 (85.7%)	17 (58.6%)
	Middle income	13 (14.3%)	6 (20.7%)
	High income	0 (0.0%)	6 (20.7%)

$\mathbf{X^2}$ = 21.436, **p**= 0.000, **df** = 2

4.7: Respondents' Recommendations for adequate intake of fruits by Pregnant women

Adequate fruit consumption for children were reported by (19.4%) of the respondent. They believe children require more nutrients and vitamins to support their growth and development. (17.6%) reported fruits consumption is good for elders because they need more nutrients to give them energy as a result of their weak body system due to aging. Few of the respondent (16.3%) recommend adequate intake of fruits for their spouses (husband) so as to increase potency in them because they believe fruits are one of the natural therapy for ailment. Sixteen percent of the respondents also reported adequate fruit consumption for friend, relative and non-pregnant women respectively for basal metabolism of the body and protection from diseases (Table 4.17)

4.8: Suggestions on ways to improve fruits consumption among pregnant women

The 120 consenting respondents identified some health promotion strategies to improve fruit consumption pattern among pregnant women. Out of the 120 consenting respondents, thirty-two percent suggested creating awareness on media such as television, radio and bill boards to have a wider reach in promoting a healthy behaviour of fruits consumption so as to lower future generational risk in the foetus. (19.3%) believed health talk at the ante- natal clinic will be more effective in promoting a healthy behaviour of fruit consumption during pregnancy. More so, (17.6%) are of the opinion that availability of fruits kind in one of the ways to improve fruit consumption during pregnancy. On the other hand, health workers should make fruit compulsory (15.2%) for pregnant women thereby emphasizing the importance of fruits. Mission houses should also imbibe this by educating their patients (15.6%) educating them on the importance of eating fruit during pregnancy. Only (0.4%) suggested fruit price as a way to improve fruit consumption during pregnancy because sometimes fruit kinds cannot be consumed due to lack of fund (Table 4.18).

Table 4.15: Groups to recommend adequate intake of fruits (multiple responses)

N=120

	Responses	
	Frequency	Percentage (%)
Children	106	19.4
Elders	96	17.6
Husband	89	16.3
Non- pregnant women	86	15.7
Friends	85	15.5
Relatives	85	15.5

Table 4.16: Suggestions on ways to improve fruit consumption among pregnant women (multiple responses) **N=120**

	Responses	
	Frequency	Percentage (%)
Creating awareness on media (TV, Radio, Bill board)	78	32.0
Health talk	47	19.3
Availability of fruits	43	17.6
Health education in hospitals and mission houses	38	15.6
Health workers should make it compulsory	37	15.2
Other specify (Price)	1	0.4
Total	120	100.0

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Socio-demographic characteristics of respondents

In this study, majority of the women were between the age ranges 24-33 years with a mean of 28.6±4.4 years. This is expected since the study population are women of reproductive age. This is supported by a study conducted in Poland, which shows that the age group of the respondents within 20- 35 year accounted for majority of the respondents (Iwona, Alfred, Ewa,Waldemar and Adam 2013). Mostly, respondents in this study were predominantly from Yoruba ethnic group. This may be due to the fact that the study was conducted in Ido Local Government Area of Oyo State in the South- western Nigeria which is predominantly a Yoruba –speaking area. In this study, most respondents were Christian. This is corroborated by the findings of Ademuyiwa and Sanni which reveal that most of their respondents were Christians (Ademuyiwa and Sanni 2013). The educational background of the respondents in the study showed that majority had a secondary education and they were traders. This result may be due to the fact that the educational policy in the country encourages one to have a minimum of secondary education which has been practise in western part of the country for decades. The fact that majority are traders is a confirmation that the economy is a substantial economy in which government have failed to provide job for the timid population, people are rather encourage to vent for themselves (Osinubi 2003).

5.2 Knowledge of fruit consumption among Respondents

The result of the data analysis showed a significant relationship between the level of education of pregnant women and knowledge of fruit consumption. A key finding in this study is that the level of knowledge of fruit consumption is found to be low among the respondents. This could probably be due to the influence of low level of exposure and lack of information on nutritional issues during pregnancy that is the reason most of the respondents feels that fruits are not important in the diet of pregnant women. This finding is supported by the findings according to Iwona et al (2013) and Ademuyiwa et al (2013) reporting insufficient knowledge among pregnant women about proper nutrition during pregnancy. Maternal diets during pregnancy have gained a lot of attention over the years due to the recognition of the increased physiological, metabolic and nutritional demand placed on the pregnant women by her gravity. The dietary intake of pregnant women needs to

provide energy and nutrients for the mother as well as the foetus this is because inadequate dietary intake in pregnancy can lead to unfavourable outcomes leading to iron deficiency anaemia and other micronutrient deficiencies which result into poor maternal weight gain which could affect the weight of the babies, maternal mortality and morbidity, labour complication and deformity in the foetus. Poor nutrition and inadequate micronutrients intake during pregnancy often begins in the uterus and extend throughout the life cycle therefore, women at childbearing age must be educated about the necessity for proper nutrition during and before pregnancy. There is a relationship between educational level and knowledge of fruit consumption.

5.3 Attitude towards fruit consumption among Respondents

From this study, majority of the respondents have a positive attitudinal disposition towards fruit consumption. This could be as a result of the information received from ante-natal clinic for those who attend and the convenience of eating fruits which can be consume at work, home and on transit without cooking. The reason for this attitude is attributed to the fact that some fruits are easily accessible and relatively cheap depending on the kind on fruits. This observation is in line with the report of Ezeama and Ezeamah (2014) in their study on attitude and socio-cultural practices during pregnancy. They observed that pregnant women showed several positive attitudes to keep healthy by attending ante-natal (ANC) and eating high protein foods, fruits and vegetables.

5.4 Pattern of fruit consumption among the respondents

The result of this study shows there is a significant relationship between level of education, income and consumption of fruits among pregnant women. Findings from the study also show that consumption of fruit is low among the respondent (pregnant women). This may be due to the noticed low knowledge of the benefit of fruit consumption among the respondent as majority of the respondents reported consumption of fruits less than thrice a week. The pattern of fruit consumption among the respondents showed a preference for orange as the mostly consumed fruits with the motive that it is good for baby, with the enlightment through health talks at the ante-natal clinic. Previous study by Awosan, Ibrahim, Essien and Okolo (2013) Ademuyiwa et al (2013) on the consumption pattern and dietary practises of pregnant women also confirm to the finding of this study that orange is the mostly consumed by pregnant women. Orange is the most commonly consumed fruits according to the majority of the respondents, because of its high vitamin C content, availability almost all

year round and affordability. The pregnant women with a higher education level consumed fruits on average more than women with secondary and primary education.

5.5 Fruit avoidance

Less than a quarter of the pregnant women in this study avoided at least one kind of fruits reasons associated with fruit avoidance were taste, dislike and delay in delivery. Fruit avoidance, especially food taboos, to a large extent, prevents pregnant women from getting adequate food nutrients to sustain mother and child. The respondents have an age long tradition and believe that eating such a fruits have some implications either for cultural, health and some other reasons. The variety of fruits avoided in pregnancy also implies that food avoidance denies pregnant women of some of the cheapest sources of protein and nutrients. This is similar to a study conducted on dietary practices and nutrient intakes of pregnant women by Alice, Christina and Richard (2012).

5.6 Barriers to adequate fruit consumption among the respondents

The study reveals that cost/ financial condition is one of the necessary barrier to the consumption of some kinds of fruit due to the fact that some kind of fruits are relatively cheap and affordable while some are not. The respondents do consume fruits based on the fact that it helps in easy digestion, to keep them healthy during pregnancy, for healthy growth of the baby in the womb and to get enough blood. This corroborates the findings of Ibrahim (2011) on fruit response efficacy and fruit consumption. There is a significant relationship between income and frequency of consumption indicating the fact that different fruits are in season throughout the year, some are usually cheap and readily available. Other major barriers are: inadequate nutritional knowledge on the importance of fruits, seasonal fluctuation of fruits kind, and perishability of fruits and non-availability of fruits kind.

Cultural belief does not have any significant role as barriers to adequate fruit consumption according to this study. This is contrary to the findings of Ezeama et al (2014) on attitude and socio-cultural practice during pregnancy among women found that cultural beliefs played significant roles in determining the kinds of food/ fruits pregnant women would consume which hinders them healthy eating. Those who avoided some fruits as taboos during pregnancy were few according to this study.

5.7 Implications of the findings for Health Promotion and Education

Findings from this study have health promotion and education implications and suggest the need for multiple interventions directed at tackling the phenomenon.

Summary of such findings includes:

1. There is an apparent poor knowledge of pregnant women on fruit consumption during pregnancy especially the ones of health importance. The lack of awareness of these nutritional facts reduces adequate consumption of fruits thereby increasing the rate of maternal mortality and morbility and also causes abnormalities in the child.
2. The findings of study have revealed that the consumption pattern of fruit is low and should be addressed with appropriate health promotion strategies such as health education awareness campaign and community sensitization targeted at pregnant women at the community level.
3. These findings could be used as a training needs assessment for the design and development of a training curiculum for upgrading the health workers knowledge and encouraging them to persist in encouraging the pregnant women to eat more of fruits during this stage.
4. The study also revealed that inadequate nutritional knowledge is one of the barriers that discourage women from eating fruit when pregnant.

The following strategies and interventions are suggested to be put in place:

- **Fruit nutrition awareness and motivations before and after pregnancy (Health Education Programme) among pregnant woman**

  The purpose of the fruit nutrition awareness is to explore nutrition awareness and to explore the associated motivations for fruits consumption. Needful education and orientation towards fruit consumption should be introduced using multimedia approach such as radio jingles, television adverts and posters at strategic places like hospitals. An adequate nutrition pattern is of major importance for one's health and well-being, especially during pregnancy when a woman undergoes major biological, physical, psychological and social transformations. It is likely to be one of the few critical periods in life when women are able to change health-related behaviors that are difficult to modify at other times.

The health workers should do more by promoting fruit consumption among the pregnant women during their ante- natal and counsel them. This will lead to all round development and motivation towards fruits consumption during and after pregnancy.

- **Encouraging Farmers to invest more in fruit Farming**

  Farmers need to be encouraged to invest more in planting varieties of fruits as compare to the same commonly kind of fruits usually planted in south western of Nigeria, while providing consumers with access to fresh produce at an affordable cost. Government and policy makers should give loans to the farmers and encourage mechanised farming with the supply of different equipments that will encourage farmers to produce more fruits with the availability of storage facility for long term storage. Residents of low-income neighbourhoods, where supermarkets are scarce and the small grocery and convenience stores that do exist sell limited fresh produce, may benefit most from the access to fruits provided through farmers' markets. Increased access through farmers' markets may be associated with increased consumption of fruits and vegetables among pregnant women and the general populace.

- **Training of health care providers**

  Nutritional education should be provided to the health care providers; this will equip them on how to handle pregnancy related diets and also enable women to go through the pregnancy stage without any complication that may affect the health of the mother and the child.

5.8 Conclusion

In spite of better education and positive attitudinal disposition, fruit consumption was lower among pregnant women due to insufficient knowledge and low level of exposure about the nutritional importance of fruit during pregnancy and not taking into cognizance the importance of fruits in their diet due to the fact that some of these women do not attend ante-natal clinic where they can acquire necessary informations on the importance of fruit intake. Due to the economic hardship of some of these women, fruits are seen as a luxury because of the level of poverty they are experiencing and the fact that most of them are self employed therefore little money earn are spent on foods rather than fruits.

The link between low knowledge and lack of the benefit embedded in adequate consumption of fruits which affect the health of the mother and the child calls for an urgent attention.

Efforts should be re-doubled to address the gaps identified in knowledge of fruit consumption among women of reproductive age and the availability of fruits in all seasons at an affordable price by encouraging mechanized and modernized farming practices to improve on the storage and availability of fruits all year round. Therefore, health promotion strategies such as health education adopting multi-media approach such as television jingles, radio jingles, posters, hand bills, bill boards etc, awareness campaign and community sensitization targeted at women at community level and health talk to pregnant women at the antenatal care emphasizing the importance of fruit should be carried out to influence adequate fruit consumption and popularize the same for consumption in the rural communities and also preparing women for better health during pregnancy.

5.9 Recommendations

Based on the findings from this study, the following recommendations are offered:

1. Public Health workers and the mass media should increase an awareness campaign to sensitize the pregnant women on the importance of fruit consumption pattern and good dietary practices.

2. Health care providers need to take every opportunity available at ante natal centers to support and encourage women more especially mothers – to- be with strategies to adopt healthful practices that will help them achieve the most balanced diets in order to ensure good health of both mother and child.

3. Government should constitute a team that will employ educators and counselors using a nutritional guide to orientate pregnant women about the necessity of fruit consumption and good nutrition during pregnancy.

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Appendix I

QUESTIONNAIRE

KNOWLEDGE, ATTITUDE AND FRUITS CONSUMPTION PATTERNS AMONG PREGNANT WOMEN IN IDO LOCAL GOVERNMENT AREA, OYO STATE

Dear Respondent,

My name is Adelaja, Adebisi Ajoke a Postgraduate student of Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan. The purpose of this study is to determine the **knowledge, attitude of pregnant women towards fruit consumption during pregnancy**. This information will be used in developing fruit consumption intervention programs. There are no right or wrong answers to the questions asked or the statements made instead, what is desired of you is your truthful and honest responses. The time needed to complete the questionnaire is approximately 15 minutes, Please note that the completion of this questionnaire is entirely voluntary.

All information gathered as a result of your participating in this study will be treated with utmost confidentiality and will be used strictly for research purpose only.

Kindly indicate your willingness to participate or otherwise by ticking [√] in the appropriate box below.

1. Yes [ ] 2. No [ ]

Official use only Interviewers name:…… Serial No……Date ……

Thank you for your cooperation

SECTION A: DEMOGRAPHIC CHARACTERISTICS

Instruction: Please, tick as appropriate [√]

1. Actual age in years (at last birthday): ……
2. Marital status: 1. Never married [ ] 2. Married [ ] 3. Divorced [ ] 4. Widow [ ]
3. Religion: 1.Christian [ ] 2.Muslim [ ] 3.Traditional [ ] 4.Others (please specify)……
4. Ethnic group: 1. Yoruba [ ] 2.Hausa [ ] 3. Igbo [ ] 4. Others (please specify)……
5. Educational level: 1. Primary [ ] 2. Secondary [ ] 3. Tertiary [ ] 4. Others …….

6. Occupation: 1. Trader [ ] 2. Artisan [ ] 3. Teacher [ ] 4. Farmer [ ] 5. Others …….....
7. Partner's Educational level: 1. Primary [ ] 2. Secondary [ ] 3. Tertiary [ ] 4. Others ……..
8. Partner's occupation: 1. Trader [ ] 2 Artisan [ ] 3 Teacher[ ] 4 Farmer [ ] 5. Others …….
9. Gestational stage: 1. First trimester [ ] 2. Second trimester [ ] 3. Third trimester [ ]
10. How many children do you have?..... Male ..... Female.....
11. Monthly income from all sources …… (in naira)

SECTION B: KNOWLEDGE ON FRUIT CONSUMPTION

Instruction: Kindly tick [√] as many options as applied to the question

SN	Statement	1.Yes	2.No	3.Don't know
12	Most fruits are high in calories and low in fat and they contain nutrients that help to prevent diseases			
13	The bioactive present in fruits helps in protecting against a number of diseases such as coronary heart diseases, hypertension and cancers			
14.	Vitamins in fruits can help to form the baby's bones and teeth, heart, ears and immune system			
15.	Lack of vitamin A can cause vision problems in babies			
16.	Folic acid in oranges and orange juice helps to prevent Neural tube defects (Spina Bifida) in infant			
17.	Fruit consumption during pregnancy is a great way to ensure a healthy baby			
18.	Consumption of fruits helps to reduce the risk of obesity among pregnant women			
19.	It is usually recommended within the first trimester			
20.	Fruits consumption cannot lead to healthier lifestyle			
21.	Fruit consumption is beneficial to health, contributing significantly to the physical functioning of the body			
22.	Fruit consumption helps to reduce the risk of hypertension			

23.	Fruit consumption helps to reduce the risk of diabetes among pregnant women			
24.	Consumption of fruit ensures the protection from Non communicable disease (NCD)			

25. Which of the following diseases can eating of fruits helps to reduce the risk?

SN	Diseases/Conditions	1. Yes	2. No	3. Don't know
1	Cardio vascular disease (heart diseases)			
2	Diabetes			
3	Stroke			
4	Some forms of cancer			
5	Obesity			
6	Malaria			
7	Others (specify_____)			

26. Inadequate consumption of fruits during pregnancy can lead to the following conditions:

Instruction: *Kindly tick* [√] *as many options you consider as correct to the question*.

SN	Disease/Condition	1. Yes	2. No	3.Don't know
1	Maternal anaemia			
2	Low foetal birth weight			
3	Foetal growth retardation			
4	Risk for maternal mortality and morbidity			
5	Abnormality in the child			

27. What is the recommended daily intake of fruit? 1) 2 servings of fruit per day [ ]
2) 3 servings of fruit per day [ ] 3) 5 servings of fruit per day [ ] 4) Don't know [ ]

28. Mention two importance of fruits in diet of pregnant women (*Tick as many as possible*).

1. Increases blood [ ] 2. Provides vitamin [ ] 3 Prevent Diseases [ ]
4. Prevent Constipation [ ] 5 Freshens the baby [ ]

SECTION C: ATTITUDE TOWARDS FRUIT CONSUMPTION DURING PREGNANCY

Instruction: Kindly tick [√] the option as applied to the question

SN	Statements	1.Agree	2.Undecided	3. Disagree
29	Is it not necessary to consume fruits while pregnant			
30	Fruit consumption during pregnancy prevents infant to be still born			
31	Pregnancy usually increases fruit consumption			
32	Women who do not consume adequate fruit during pregnancy will have difficulty during delivery			
33	It is forbidden for pregnant women to eat fruit			
34	Health workers do support the consumption of fruits for pregnant women			
35	Eating different types of fruits are challenging for pregnant women			
36	Fruit consumption by pregnant women is relatively easier because it can be consume at work, home, on transit, and requires no cooking.			

37. Were you given any information at the ante natal clinic (ANC) regarding fruit consumption? 1. Yes [ ] 2. No [ ]

38. Is it the information that motivates you to eat fruit? 1. Yes [ ] 2. No [ ]

SECTION D: FREQUENCY OF FRUIT CONSUMPTION AMONG PREGNANT WOMEN

39. Do you consume fruit in the last seven days? 1. Yes [ ] 2. No [ ]

40. In the last 7 days how many times have you consumed fruit? 1. One [ ] 2. Two [ ]
3. Three [ ] 4. Four [ ] 5. Others ……

41. **Instructions:** Kindly tick [√] the option below in order of consumption

SN	All the fruits consumed in the last 7 days	1. Yes	2. No	What motivate you to consume it	Dominant decision maker on the consumption of these fruits	How many days in the last 7 days do you consume these fruits
1	Banana			1 I like it [ ] 2 Good for baby [ ] 3 Prevent disease [ ] 4 Health workers [ ] 5 For safe delivery [ ] 6 Others ……	1 Self [ ] 2 Husband [ ] 3 Friend [ ] 4 Media [ ] 5 Health workers [ ] 6 Others ……..	
2	Mangoes			1 I like it [ ] 2 Good for baby [ ] 3 Prevent disease [ ] 4 Health workers [ ] 5 For safe delivery [ ] 6 Others ……	1 Self [ ] 2 Husband [ ] 3 Friend [ ] 4 Media [ ] 5 Health workers [ ] 6 Others ……	
3	Pawpaw			1 I like it [ ] 2 Good for baby [ ] 3 Prevent disease [ ] 4 Health workers [ ] 5 For safe delivery [ ] 6 Others ……	1 Self [ ] 2 Husband [ ] 3 Friend [ ] 4 Media [ ] 5 Health workers [ ] 6 Others ……	
4	Apple			1 I like it [ ] 2 Good for baby [ ] 3 Prevent disease [ ] 4 Health workers [ ] 5 For safe delivery [ ] 6 Others ……	1 Self [ ] 2 Husband [ ] 3 Friend [ ] 4 Media [ ] 5 Health workers [ ] 6 Others ……	
5	Pineapple			1 I like it [ ] 2 Good for baby [ ] 3 Prevent disease [ ]	1 Self [ ] 2 Husband [ ] 3 Friend [ ]	

				4 Health workers [ ] 5 For safe delivery [ ] 6 Others ……	4 Media [ ] 5 Health workers [ ] 6 Others ……	
6	Waterm elon			1 I like it [ ] 2 Good for baby [ ] 3 Prevent disease [ ] 4 Health workers [ ] 5 For safe delivery [ ] 6 Others ……	1 Self [ ] 2 Husband [ ] 3 Friend [ ] 4 Media [ ] 5 Health workers [ ] 6 Others ……	
7	Orange			1 I like it [ ] 2 Good for baby [ ] 3 Prevent disease [ ] 4 Health workers [ ] 5 For safe delivery [ ] 6 Others ……	1 Self [ ] 2 Husband [ ] 3 Friend [ ] 4 Media [ ] 5 Health workers [ ] 6 Others ……	
8	Cucumb er			1 I like it [ ] 2 Good for baby [ ] 3 Prevent disease [ ] 4 Health workers [ ] 5 For safe delivery [ ] 6 Others ……	1 Self [ ] 2 Husband [ ] 3 Friend [ ] 4 Media [ ] 5 Health workers [ ] 6 Others ……	
9	Pea			1 I like it [ ] 2 Good for baby [ ] 3 Prevent disease [ ] 4 Health workers [ ] 5 For safe delivery [ ] 6 Others ……	1 Self [ ] 2 Husband [ ] 3 Friend [ ] 4 Media [ ] 5 Health workers [ ] 6 Others ……	
10	Carrot			1 I like it [ ] 2 Good for baby [ ] 3 Prevent disease [ ] 4 Health workers [ ] 5 For safe delivery [ ] 6 Others ……	1 Self [ ] 2 Husband [ ] 3 Friend [ ] 4 Media [ ] 5 Health workers [ ] 6 Others ……	

11	Walnut			1 I like it [ ] 2 Good for baby [ ] 3 Prevent disease [ ] 4 Health workers [ ] 5 For safe delivery [ ] 6 Others ……	1 Self [ ] 2 Husband [ ] 3 Friend [ ] 4 Media [ ] 5 Health workers [ ] 6 Others ……	
12	Grape			1 I like it [ ] 2 Good for baby [ ] 3 Prevent disease [ ] 4 Health workers [ ] 5 For safe delivery [ ] 6 Others ……	1 Self [ ] 2 Husband [ ] 3 Friend [ ] 4 Media [ ] 5 Health workers [ ] 6 Others ……	
13	Others …….					

42. Which type of fruits do you avoid consuming during this pregnancy? Kindly mention them with reasons.

SN	Fruits	Reason
1		
2		
3		

SECTION E: BARRIERS AFFECTING ADEQUATE CONSUMPTION OF FRUITS DURING PREGNANCY

Instructions: Kindly tick [√] the options below on factors affecting your consumption of fruits during this period of your pregnancy.

S/N	Statement	To a large extent	To small extent	Not at all
43	Non availability of fruit kind			

44	Cultural beliefs about fruit			
45	Religious beliefs			
46	Storage difficulty			
47	Fruits are highly perishable			
48	Cost			
49	Seasonal fluctuation of fruit			
50	Likes and dislike of the household			
51	Lack of interest			
52	Inadequate nutritional knowledge on the importance of fruits			

53. Do you have any fruit taboo? 1. Yes [ ] 2. No [ ]

54. If yes, kindly mention two. 1_____

2_____

55. Which of these groups would you recommend adequate intake of fruits: ***kindly thick as many as possible*** 1. Friends [ ] 2. Relative [ ] 3. Children [ ] 4. Elders [ ] 5. Husband [ ] 6. Non-pregnant women [ ]

56. Suggest ways of improving fruit consumption among pregnant women

Instruction: Kindly thick [√]***as applicable***

1. Health talk [ ]
2. Creating awareness on TV, Radio and Bill boards [ ]
3. Health education in hospitals and mission houses [ ]
4. Health workers should make it compulsory [ ]
5. Availability of fruits [ ]
6. Others please specify _____

Thanks for your participation.

Appendix II

IWE IBEERE

IWE IBEERE LORI IMO, ISE ATI ESO JIJE LAARIN AWON ALABOYUN NI AGBEGBE IJOBA IBILE IDO, NI IPINLE OYO

Eku dede iwo yi o, oruko temi ni Adelaja Adebisi Ajoke. iwadi yi je eyi ti akeko nipa ilera aralu kan ti owa lati eka ti won ti nko nipa ilosiwaju ati imo nipa ilera, ni ekan ti ati nko nipa ilera aralu, ti ile iwe giga ilu Ibadan.

Ise yi wa lati se iwadi***nipa imo, iha ti alaboyun ko si eso jije, ati bi alaboyun se n je eso si ni agbegbe ijoba ibile ido,ni ipinle oyo***. Inu mi yio dun lopo fun Idahun toto yin si awon Ibeere ti aba bi yin. Siwaju si, a o se ipamo ghogbo oun ti eba ba wa so dada, niwon igba ti o je pe ise yi wa fun eto eko ati ilosiwaju imo. Mo tun fe sofun yin wipe kikopa ninu iwadi yi ki se dandan, eyi tumo si wipe e le gba lati kopa tabi ki e se alaikopa. Ati gba iyonda lowo igbimo to se amojuto ise iwadi imo ijinle eka ti ipinle oyo. E jowo e se ami si iho toba ye lati fi ipinnu yin han lati kopa tabi se aikopa.

E jowo efi imo yin han kati ko pa ninu iwadi yi nipa fifi ayi[√] sinu awon apoti wonyi?

Beeni [ ] Beeko[ ]

Fun lilo awon osise
Oruko oluforowanilenuwo ……..... Onka ……...

Ese pupo fun ifowosowopo yin.

IPIN A: AWON OUN TO JEMO OLUKOPA NINU IWADI

Itosona: Ejowo, e fi amin yin [√] si ibi ti o ye

1. Ojo ori (ni odun) (ojo ori to gbeyin): ……
2. Ipo igbeyawo: 1. Mi oi ti gbeyawo [ ] 2. Mo ti gbeyawo [ ] 3. Ati ko ra sile [ ] 4. Opo [ ]
3. Esin : 1.Kiritieni [ ] 2. Musulumi [ ] 3. Ibile [ ] 4.Omiran (Ejowo edaruko)……
4. Eya: 1. Yoruba [ ] 2.Hausa [ ] 3. Ibo [ ] 4. Omiran (Ejowo edaruko)……
5. Ipele eko ti e ka: 1. Alakobere [ ] 2. Sekondari [ ] 3. Eko giga [ ] 4. Omiran …….

6. Ise ti en se: 1. Oja tita [ ] 2. Ise owo [ ] 3. Oluko [ ] 4. Ise agbe [ ] 5. Omiran ……..

7. Iwe ti oko yin ka: 1. Alakobere [ ] 2. Sekondari [ ] 3. Eko giga [ ] 4. Omiran ……..

8. Ise ti oko yin nse: 1. Oja tita [ ] 2 Ise owo [ ] 3 Oluko [ ] 4 Ise agbe [ ] 5. Omiran ……

9. Ipele ti oyun wa: 1. Ipele akoko [ ] 2. Ipele ekeji [ ] 3. Ipele eketa [ ]

10. Iye omo melo le ti bi?..... Okunrin ..... Obirin.....

11. Iye owo tin wo le ni gbogbo ona loosu …… (ni naira)

IPIN B: IMO NIPA ESO NI JIJE

Itona: E jowo e fi amin yi [√] si ibi to ye ninu awon ibeere wonyi

SN	Gbolohun	1.Beeni	2.Beeko	3.Mi o le so
12	Eso ni e roja ti o po pelu ora kekere ni eyi ti o le dekun orisirisi arun.			
13	Awon e ro ja ti o wa ninu eso man dekun orisirisi arun bi arun okan, eje ruru ati gegere.			
14.	Fitamin ninu eso a ma jeki egungun omo, eyin okan, eti dagba bi o ti ye.			
15.	Aito fitamin A a ma fa arun oju sara omo jojolo.			
16.	Folic acid ninu osan tabi omi osan a ma dekun ki egungun eyin omo ma to bio ti ye nipa arun ti a mo si (Spina bifida) lara omo jojolo.			
17.	Eso jije ni asiko iloyun je ona kan pato lati le je ki omo jojolo ni igbe aye alaafia.			
18.	Eso jije a ma ran ni lowo lati dekun ora pupo lara alaboyun.			
19.	Eso jije pon dandan ni ipele oyun akoko.			
20.	Eso jije ko le ja si igbe aye alaafia			
21.	Eso jije a ma se anfaani fun ara ni pa didagba soke ago ara			
22.	Eso jije a maa dekun nini aarun eje ruru			
23.	Eso jije a maa dekun aarun ito suga laarin awon			

	alaaboyun.			
24.	Jije eso a maa daabobo eniyan lowo aarun ti a ko le ko laara elomiran.			

25. Irufe awon aarun wonyin wo ni eso jije a maa ran ni lowo lati dekun re?

SN	Irufe awon aarun	1. Beeni	2. Beeko	3. Mi o le so
1	Aarun okan			
2	Ito suga			
3	Ro lapa, ro lese			
4	Irufe awon aarun jejere			
5	Ora pupo lara			
6	Aisan iba			
7	Omiran (daruko_____)			

26. Aito eso jije ni asiko iloyun a maa sokun fa irufe awon aisan wonyi:

Itosona: *Ejowo efi amin yi*[√]*si awon ibeere wonyi ni bi ti o ye.*

SN	Aisan	1.Beeni	2. Beeko	3.Mi o le so
1	Ki eje mato laara alaboyun			
2	Ki omo jojolo (ikoko) ma gbe iwon			
3	Ki ikoko ma dagba bi o ti ye			
4	Ijamba fun alaboyun tio le ja si iku tabi aarun			
5	Orisirisi arun ninu omo tabi ki ara omo ma le to			

27. Igba melo lo ye lati maa je eso loojo? 1) Jije eso lee meji loojo [ ]
2) Jije eso lee meta loojo [ ] 3) Jije eso lee maarun loojo [ ] 4) Mi o le so [ ]

28. Sooo anfaani meji ti eso nse ninu onje alaaboyun. (*Mu bi o ba se ye*).

1 On fun ni leje [ ] 2. On fun ni lokun [ ] 3 On de na arun [ ]

4. On de na airigbe ya deede [ ] 5 On maara omo dan [ ]

IPIN C: IHA TI ALABOYUN KO SI ESO JIJE NI ASIKO ILOYUN.

Itona: Edakun efi ami yi [√] si ibi ti o ye

SN	Gbolohun	1.Mo fara mo o	2.Mi o le so	3. Mi o fara mo
. 29	Ko pon dandan fun alaboyun lati je eso ni asiko iloyun			
. 30	Eso jije ni asiko iloyun a maa dena abiku omo			
. 31	Ipo iloyun a maa sokun fa eso jije lopolopo			
. 32	Alaboyun ti ko ba je eso daradara ni asiko iloyun a maa ni idojuko ni asiko irobi.			
. 33	Eewo ni eso jije fun alaboyun.			
. 34	Awon osise ilera paaapa fi owo si eso jije fun awon alaboyun.			
. 35	Onira fun alaboyun lati maa je orisirisi eso			
. 36	Eso rorun ni jije fun alaboyun ni ibi ise, ile, ona ati papa ko nilo sise kaa to je e.			

37. Nje won man fun yin ni imoran nipa eso jije nigba ti e ba lo fun ipade alaboyun ni ile iwosan bi? 1. Beeni [ ] 2. Beeko [ ]
38. Nje imoran yi lo sokun fa eso jije yin? 1. Beeni [ ] 2. Beeko [ ]

IPIN D: BI AWON ALABOYUN SE MA N JE ESO SI

39. Laarin ojo meje sehin, nje e je eso bi? 1. Beeni [] 2. Beeko []
40. Ee melo ni e je eso laarin ojo meje yi? 1. Ee kan [ ] 2. Ee meji [ ] 3. Ee meta [ ] 4. Ee merin [ ] 5. Omiran ……

41. **Itona:** E jo wo efi ami yi [√] sibi ii e se ma n je eso

SN	Gbogbo eso ti a je laarin ojo meje sehin.	1. Beeni	2. Beeko	Ohun to sokun fa eso jije yin	Eni ti o sokun fa eso yii ni jije	Ojo meloo lefi je eso yii laarin ojo meje sehin.
1	Ogede			1 Mo fe ran re [ ] 2 Odara f'omotuntun[3 Fun didena arun [ ] 4 Osise ilera [ ] 5 Fun asokale ayo [ ] 6 Omiran ……	1 Emi ti kara mi [ ] 2 Oko [ ] 3 Ore [ ] 4 Ero gbagede [ ] 5 Osise ilera [ ] 6 Omiran ……	
2	Mongoro			1 Mo fe ran re [ ] 2 Odara f'omotuntun[3 Fun didena arun [ ] 4 Osise ilera [ ] 5 Fun asokale ayo [ ] 6 Omiran ……	1 Ti kara mi [ ] 2 Oko [ ] 3 Ore [ ] 4 Ero gbagede [ ] 5 Osise ilera [ ] 6 Omiran …….	
3	Ibepe			1 Mo fe ran re [ ] 2 Odara f'omotuntun[3 Fun didena arun [ ] 4 Osise ilera [ ] 5 Fun asokale ayo [ ] 6 Omiran ……	1 Emi ti kara mi [ ] 2 Oko [ ] 3 Ore [ ] 4 Ero gbagede [ ] 5 Osise ilera [ ] 6 Omiran…… …	
4	Apple			1 Mo fe ran re [ ] 2 Odara f'omotuntun[3 Fun didena arun [ ] 4 Osise ilera [ ] 5 Fun asokale ayo [ ] 6 Omiran ……..	1 Emi ti kara mi [ ] 2 Oko [ ] 3 Ore [ ] 4 Ero gbagede [ ] 5 Osise ilera [ ] 6 Omiran ……	
5	Ope oyinbo			1 Mo fe ran re [ ] 2 Odara f'omotuntun[3 Fun didena arun [ ]	1 Emi ti kara mi [ ] 2 Oko [ ]	

				4 Osise ilera [ ] 5 Fun asokale ayo [ ] 6 Omiran ……	3 Ore [ ] 4 Ero gbagede [ ] 5 Osise ilera [ ] 6 Omiran ……	
6	Watermelon			1 Mo fe ran re [ ] 2 Odara f'omotuntun[3 Fun didena arun [ ] 4 Osise ilera [ ] 5 Fun asokale ayo [ ] 6 Omiran ……	1 Emi ti kara mi [ ] 2 Oko [ ] 3 Ore [ ] 4 Ero gbegede [ ] 5 Osise ilera [ ] 6 Omiran ……	
7	Osan			1 Mo fe ran re [ ] 2 Odara f'omotuntun[3 Fun didena arun [ ] 4 Osise ilera [ ] 5 Fun asokale ayo [ ] 6 Omiran……	1 Emi ti kara mi [ ] 2 Oko [ ] 3 Ore [ ] 4 Ero gbagede [ ] 5 Osise ilera [ ] 6 Omiran ……	
8	Cucumber			1 Mo fe ran re [ ] 2 Odara f'omotuntun[3 Fun didena arun [ ] 4 Osise ilera [ ] 5 Fun asokale ayo [ ] 6 Omiran …	1 Emi ti kara mi [ ] 2 Oko [ ] 3 Ore [ ] 4 Ero gbagede [ ] 5 Osise ilera [ ] 6 Omiran ……..	
9	Pea			1 Mo fe ran re [ ] 2 Odara f'omotuntun[3 Fun didena arun [ ] 4 Osise ilera [ ] 5 Fun asokale ayo [ ] 6 Omiran ……..…	1 Emi ti kara mi [ ] 2 Oko [ ] 3 Ore [ ] 4 Ero gbagede [ ] 5 Osise ilera [ ] 6 Omiran …	
10	Carrot			1 Mo fe ran re [ ] 2 Odara f'omotuntun[3 Fun didena arun [ ] 4 Osise ilera [ ] 5 Fun asokale ayo [ ]	1 Emi ti kara mi [ ] 2 Oko [ ] 3 Ore [ ] 4 Ero gbagede [ ] 5 Osise ilera [ ]	

				6 Omiran….. …	6 Omiran……. …	
11	Awusa/ Asala			1 Mo fe ran re [ ] 2 Odara f'omotuntun[3 Fun didena arun [ ] 4 Osise ilera [ ] 5 Fun asokale ayo [ ] 6 Omiran ……	1 Emi ti kara mi [ ] 2 Oko [ ] 3 Ore [ ] 4 Ero gbagede [ ] 5 Osise ilera [ ] 6 Omiran ……	
12	Grape			1 Mo fe ran re [ ] 2 Odara f'omotuntun[3 Fun didena arun [ ] 4 Osise ilera [ ] 5 Fun asokale ayo [ ] 6 Omiran ……	1 Emi ti kara mi [ ] 2 Oko [ ] 3 Ore [ ] 4 Ero gbagede [ ] 5 Osise ilera [ ] 6 Omiran……..	
13	Omiran …….					

42. Irufe eso wo ni e o nife si ni jije ni asiko ti e wa yi? Ejowo e daruko won pelu idi re ti e ko fi je won.

SN	Eso	Idi
1		
2		
3		

IPIN E: AWON OHUN TI O JE IDENA ESO JIJE BI O TI YE NI ASIKO ILOYUN.

Itona: E jo wo e fi amin yi [√] si awon ohun to je idena fun eso jije yin ni asiko oyun ti e wa yi.

S/N	Gbolohun	Oni ipa pupo	Oni ipa die/ kekere	Ko ni ipa
43	Aisi irufe eso ti e nife si			
44	Igbagbo ibile nipa eso			
45	Igbagbo esin			
46	Isoro ati ma f'eso pamo			
47	Eso a maa tete baje			

48	Owo ati fi raa			
49	Igba ati akoko orisirisi ti eso ni			
50	Awon ara ile mi o feran re			
51	Ai ni'fe si eso			
52	Aini imo to nipa awon anfaani ti o wa ninu eso jije.			

53. Nje eni eso ti o je eewo? 1. Beeni [ ] 2. Beeko [ ]
54. Bi oba je beeni, ejowo e daruko meji. 1_____ 2_____
55. Irufe isori wo ni e le gba niyanju lati maa je eso bo ti ye: ***itona: ele mu ju idahun kan.*** 1. Ore [ ]2. Ara ile [ ] 3. Omo kekeke [ ] 4. Awon agbalagba/ Arugbo [ ] 5. Oko [ ] 6. Awon obirin ti ko loyun [ ]
56. Daruko awon ona ti o le ran awon alaboyun lowo lati le maa je eso bi o ti ye ni ipo iloyun ti won wa.

Itona: Ejowo efi ami yi [√]***si ibi ti o ye***

1. Eko lori ilera [ ]
2. Ipolongo gbo gbooogbo ni ori amohun maworan, asoro ma gbesi ati boodu ipolongo nla [ ]
3. Eko lori ilera ni ile iwosan ati ile igbebi gbogbo [ ]
4. Ki awon osise ilera ma pon di dandan fun alaboyun [ ]
5. Ki eso wa ni opo yan turu [ ]
6. Omiran (Ejowo e daruko) _____

Adupe pupo fun iko pa yin.