FACTORS AFFECTING THE UPTAKE OF VITAMIN A SUPPLEMENTATION AMONG UNDER-FIVE CHILDREN IN UMUAHIA NORTH LOCAL GOVERNMENT AREA, ABIA STATE

BY

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DECLARATION

I declare that the work in the dissertation titled "Factors Affecting the Uptake of Vitamin A Supplements among Under-Five Children in Umuahia North LGA, Abia State" was performed by me in the Department of Community Medicine, Ahmadu Bello University, Zaria under the supervision of Prof. S.H. Idris. The information derived from the literature has been duly acknowledged. No part of this dissertation was previously presented for another degree or diploma at any university.

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CERTIFICATION

I certify that the work for this dissertation entitled "Factors Affecting the Uptake of Vitamin A Supplements among Under-Five Children in Umuahia North LGA, Abia State" by OKEZUE, Godwin Chukwudike meets the regulation governing the award of the degree of Masters of Public Health in Field Epidemiology of Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

I dedicate this research work to my beautiful family, for their patience and understanding during the course of this study, and to my parents, especially my late mother for shaping me to the man I have become.

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LIST OF ACRONYMS

DPT	Diphtheria Pertussis and Tetanus
EPI	Expanded Programme on Immunization
HKI	Helen Keller International
IVACG	International Vitamin A Consultative Group
LGA	Local Government Area
MDGs	Millennium Development Goals
MNCHW	Maternal New-born Child Health Week
MOH	Ministry of Health
NIDs	National Immunization Days
PECS	Post Event Coverage Surveys
RI	Routine Immunization
UN	United Nations
UNICEF	United Nations Children Funds
UNGASS	United Nations General Assembly Special Session
UNLAG	Umuahia North Local Government Area
VAD	Vitamin A Deficiency
VAS	Vitamin A Supplementation
WHO	World Health Organization

SUMMARY

Vitamin A deficiency (VAD) is associated with increased morbidity and mortality, especially among pregnant, lactating women and children. Its availability in the body therefore plays a very important role in the physiology of vision and immunity. The aim of this study is to determine the factors affecting the uptake of vitamin A supplements among under-five children in Umuahia North LGA of Abia State.

A cross-sectional approach was adopted in conducting this study among mothers/caregivers of under five children in households in the study area who were administered interviewer administered questionnaire meant to elicit Socio-demographic information of mother/caregiver, Awareness of vitamin A supplementation of mothers/caregivers, Attitude of respondents on Vitamin A supplementation, Acceptability of vitamin A supplement in the communities, and Availability of Vitamin A Supplement in all the selected health centres in Umuahia North Local Government Area (UNLGA).

A total of 400 respondents from different communities in Local Government were included in the study. Similarly, Health Care Workers from the ten selected health facilities in the Local Government were also included. The mean age of mothers was 31.5(SD=6.67) years that of their children was 26.4 (SD= 14.6) months. Majority of the respondents were married women (92%). About 48.3% had a tertiary education and were house workers or businesswomen 20.8%, 27.3% respectfully. The coverage for vitamin A supplementation was 58.1% and it associated with child's age and tribe (Odd= 13.44, p= 0.009), (Odd= 9.71, p= 0.008). The awareness and knowledge scores indicated that awareness was slightly above average score while knowledge was good on relevant information on vitamin A supplementation, causes of deficiency, signs and symptoms of deficiency and measures of prevention of vitamin A deficiency respectively. The

attitude scores also indicated an achievement of average result scores of the respondents' responses.

Vitamin A coverage in the study was similar though slightly below the national figure for Abia State of 66% in 2013. The study recommended need for the government to make adequate provision of vitamin A at all time in registered private and government health facilities within the local government area and provide good training to healthcare professional.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Micronutrients are nutrients required by the body in minute amount for proper body functions.[1] Micronutrients which include vitamins and minerals play vital roles in body growth and development, reproduction, brain functions and resistance to diseases among others. Vitamin A, iron, iodine and recently zinc are the major micronutrients of public health importance especially in developing country like Nigeria,[2] this is because of the severity and seriousness of their deficiencies and consequences on health, learning capacities and the productivity of affected people. Micronutrient deficiencies increase morbidity and mortality rates not only in children under-five years, pregnant and lactating mothers, who are more vulnerable but also to the general populace including vibrant adolescents.[3] It is generally known that the prevalence of malnutrition and micronutrients deficiency increases rapidly in under-five children because of rapid growth and development, therefore deficiency of these micronutrients inhibits the normal health, growth and development of children under five years of age. Children may look healthy and their diets may provide adequate energy and protein but are lacking in micronutrients. This is referred to as "hidden hunger".

Vitamin A is the name of a group of fat-soluble retinoid, including retinol, retinal esters, they are stored in the liver. Two different types of vitamin A are found in the diet. Preformed vitamin A is found in animal products such as meat, fish, poultry and dairy foods. The other type, pro-vitamin A (commonest type) is found in plant-based foods such as fruits and vegetables. Vitamin A is also available in dietary supplements, usually in the form of retinyl acetate or retinyl palmitate (preformed vitamin A), beta-carotene (pro-vitamin A) or a combination of preformed and pro-vitamin A.

Retinol is the most active form of vitamin A. Vitamin A plays an important role in vision, bone growth, reproduction, cell division and differentiation.[4] It maintains the surface linings of eye, respiratory, urinary, and intestinal tracts. Vitamin A aids lymphocytes, which help destroy harmful bacteria and help them function more effectively. It is required for development and maintenance of the epithelial cells, in the mucus membranes, and is important in the storage of fat and synthesis of protein and glycogen.[4]

Vitamin A (retinol) is present in animal products such as milk, eggs, meat and especially in liver. The body can also form vitamin A from pro-vitamin A (beta-carotene and certain other carotenoids) which are present in a wide variety of orange-colored fruits and vegetables, such as carrots, sweet potato, cassava, and mango, and in green leafy vegetables such as spinach, radish and pumpkin leaves.

Whether a person gets sufficient vitamin A from their food depends on various factors: the total food intake, general health, the vitamin A demand of the body, how much of the (pro) vitamin A is absorbed by the body and the efficiency of conversion of pro-vitamin A to vitamin A (the bio-availability). (Pro) vitamin A is fat-soluble, so without fat or oil in the food it cannot be absorbed in the gut. The bio-availability of pro-vitamin A compounds also depends on food matrix and how food is prepared. For example, more pro-vitamin A is taken up from cooked and mashed vegetables than from raw products. Dietary deficiencies in other nutrients such as zinc and fat/oil can limit the rate of conversion, while a lack of vitamin A can, in turn, decreases iron metabolism.[74] Hence, a balanced and diverse diet is of importance in maintaining the body's capacity to absorb pro-vitamin A and convert it to vitamin A.[5]

Vitamin A is important for the fetus embryonic growth – including the development of the heart, lungs, kidneys, eyes, and bones, and the circulatory, respiratory, and central nervous systems[5]. Vitamin A is particularly essential for women in their final trimester, as it helps with postpartum tissue repair.[5]

Vitamin A deficiency (VAD) occurs when too little vitamin A is present in the food over a long period. Vitamin A is fat soluble and excessive vitamin A can be stored in the liver, so VAD does not occur immediately when there is no vitamin A in the food, but when the storage in the body has been exhausted. Vitamin A plays several crucial roles in the human body. In the retina of the eyes, it is needed for the adaptation to darkness, so VAD leads to night blindness. Besides that, vitamin A is important in all body tissues to maintain growth and health of cells. In particular, epithelia cells are affected by lack of vitamin A, leading to a weakening of the immune system and to irreversible blindness due to eye lesions.

VAD can occur to individuals of all age. However, it is particularly relevant to children under-five years of age. VAD-related blindness is most prevalent in children under the age of 3, because this period is characterized by high requirements of vitamin A to support growth, the transition from breastfeeding to other food, and increased numbers of infections.[6]

An estimated 250,000 to 500,000 children worldwide become partially or totally blind each year due to VAD, and about half of them die within a year of losing their sight. Most of the 100 to 140 million children affected by VAD worldwide have sub-clinical manifestations. That is, they are vitamin A deficient, but they don't (yet) have the classical symptoms such as night blindness. They are more likely to be more severely affected by measles, tuberculosis, diarrhoea and other illnesses and thus have a higher mortality risk. It was also estimated in 2003 by WHO that the

elimination of VAD could reduce childhood mortality by 25% and the mortality through measles by 50%.

VAD is also common in pregnant women in the Global South, because pregnant and breast-feeding women have higher demands of vitamin A. It exposes them to a higher risk of death during or shortly after giving birth. Nearly 600,000 women die from childbirth-related causes every year, the vast majority of them from complications that could be reduced through better nutrition including provision of vitamin A.[5] In addition, children born by mothers with VAD start their life with precious little vitamin A stored in their bodies.

Vitamin A deficiency (VAD) is a major public health problem. The most vulnerable group for VAD includes under-five children and pregnant women in low-income countries. In children, VAD is the leading cause of preventable visual impairment and blindness. Twenty six percent of vitamin A–deficient children live in Africa, with the largest number in Ethiopia.[6] VAD affects almost one (1) in every three (3) children in Nigeria.[7] World Health Organization (WHO) has classified Nigeria among 34 countries in the world with serious problem of VAD related nutritional blindness and xerophathalmia.[7] VAD significantly increases the risk of severe illness and death from common childhood infections, particularly diarrheal diseases and measles.[8]

Infants and young children are one of the vulnerable groups in the society. They are more vulnerable when they are denied their rights to proper feeding and good nutrition. Nigeria ranks 14th in global assessment of under-five mortality rate and approximately one million children die annually in Nigeria before their 5th birthday.[9] Nigeria is among the 20 countries in the world that account for 80% of undernourished children. The causes of this public health problem in Nigeria

are complex and multidisciplinary; however, poor quality and quantity of foods given to children play a major role.[10]

In Umuahia North Local Government Area (LGA) of Abia State as also observed in most developing countries, have integrated strategies to deliver vitamin A supplements to infants and children in their national health policies.[11, 12] The delivery of vitamin A has been integrated into routine health services, for example through the establishment of biannual "special days", when vitamin A supplementation is combined with other child survival interventions such as deworming or nutrition education. Vitamin A supplements are also commonly distributed as part of the Expanded Programme on Immunization (EPI) (especially at 9 months, alongside measles vaccination). In 2009, about 77% of preschool children in more than 103 priority countries received two doses of vitamin A supplements.[13]

Provision of high doses of vitamin A every 6 months until the age of 5 years was based on the principle that a single, large dose of vitamin A is well absorbed and stored in the liver, and then mobilized, as needed, over an extended period of time.[14] A dose of 100, 000 International Units (IU) in infants 6–11 months of age and 200, 000 IU in children 12–59 months of age is considered to provide adequate protection for 4–6 months, with the exact interval depending on the vitamin A content of the diet and the rate of utilization by the body.[11,15] In most children 6–59 months of age, a dose of 100, 000–200, 000 IU of vitamin A is well tolerated, although side-effects such as headache, nausea or vomiting, and diarrhoea have been reported in 3–7% of these children.[16] However, these symptoms are transient, with the large majority starting and disappearing within 24 hours of dosing. There are no known deaths attributed solely to vitamin A toxicity due to overconsumption of vitamin A.[16]

1.2 Problem Statement

Vitamin A because of its immense role is critical in the health and nutritional statues of children under-five years of age, therefore its deficiency together with other micronutrients impacts heavily on the development of the under-five child. Similarly, vitamin A deficiency is very likely to be a contributor to maternal mortality.[17] Thus, it is a significant public health issue not only as the main cause of preventable blindness in children, but also as a threat to child and maternal survival.[17] In recognition of this burden of illness, the elimination of vitamin A deficiency as a public health problem was set as a goal at the World Summit for Children in 1990 and reiterated by the World Health Assembly in 1991 and the International Conference in Nutrition in 1992. Although food fortification and dietary diversification approaches are fundamental to combating vitamin A deficiency, the administration of vitamin A supplements has proven to be a rapid and cost-effective complementary strategy that has received widespread support.[17]

It is the fundamental right of all children to adequate nutrition for a healthy life. Unfortunately, this fundamental right is often ignored in some areas because the consequences of poor nutrition may not be immediately apparent. Although they may not always display visible signs, approximately 127 million preschool children worldwide are affected by underlying deficiency in vitamin A, putting them at greater risk of illness and death.[18] Vitamin A deficiency is a major contributor to the mortality of children under five.[19] Improving the vitamin A status of deficient children through supplementation enhances their resistance to disease and can reduce mortality from all causes by approximately 23 per cent.[20] Guaranteeing high supplementation coverage is therefore critical, not only to eliminating vitamin A deficiency as a public-health problem.[20]

A study had indicated that mortality rates are increased among children with mild vitamin A deficiency[21] and that, in many areas, improvement in vitamin A status can reduce the risk of

mortality from childhood infections by as much as 19—54%.[22, 23, 24, 25] The reduction in mortality that results from improvements in vitamin A status exceeds what would be expected solely from reducing the numbers of deaths associated with xerophthalmia vitamin A deficiency appears to increase the risk of death even before xerophthalmia is clinically apparent Vitamin A therapy reduces the severity of complications and the mortality rates associated with measles[27,28,29] and improvement in community vitamin A status reduces the subsequent risk of measles mortality.[24,26] Thus, WHO and UNICEF recommend vitamin A supplementation as part of the case management of measles in populations among whom vitamin A deficiency is known to be a problem or measles case-fatality rates exceed 1%.[30] It is estimated that at least one million child deaths would be prevented each year if vitamin A nutritive were improved.[31] The impact of improved vitamin A status on preschool mortality varies from one population to another and depends on a wide variety of factors These include severity and prevalence of pre-existing vitamin A deficiency, concomitant nutritional and related disorders, and the type, intensity, and frequency of prevailing infections and related factors.[20, 21]

Global coverage figures for 2004 indicate that approximately 68 per cent of children 6–59 months old received at least one dose of vitamin A. Summary coverage estimates, however, often mask problems in reaching the most disadvantaged children and those most in need of the life-saving protection of vitamin A supplements.[32]

Despite availability of vitamin A rich food in Abia state, vitamin A deficiency is still widespread as documented in National Demographic Health Survey (NDHS) of 2003, 2008 and 2013 which shows a continuous drop in the coverage of children under-five years old who receives vitamin A supplements.

Interestingly, most caregivers of children under-five years of age affected by VAD are unaware of this health challenge and this shows that children are highly vulnerable to both VAD and its complications.

WHO developed a strategy for vitamin A supplementation (VAS) for children aged 6-59 months, but there is paucity of data to show the potential impact of this strategy developed by WHO.

Vitamin A deficiency (VAD), which is characterized by visual impairment and lifetime blindness, remains a global health problem, afflicting more than 190 million preschool-aged children around the world,[36] the majority of whom reside in developing countries.[37] In sub-Saharan Africa, VAD continues to be a major contributing factor to the increasing trends observed in childhood morbidity and mortality from infectious diseases in addition to paediatric blindness.[16,37,38]

Global estimates suggest that 127 million preschool-age children have VAD and therefore are at an increased risk of death, mainly from diarrhoea, measles, and malaria; an estimated 26% to 33% of vitamin A deficient children worldwide live in sub-Saharan Africa.[40,41] Furthermore, the largest number of countries affected is in Africa, whereas the largest number of children with this deficiency is in south-east Asia[39] because of insufficiently varied diets, poor maternal education and inadequate hygiene.[40,41]

In Nigeria, data obtained from the NDHS, 2003, 2008 and 2013 show a continuous decrease in coverage of Vitamin A in Abia state below the national target of 80% coverage. With Umuahia North LGA of Abia State in South-Eastern Nigeria contributing greatly to this poor data on Vitamin A deficiency, and if this declining data are not improved upon, it will lead to lower immunity and increases rate of illness and death.

In Abia State and Nigeria, Vitamin A was introduced into the routine immunization schedule with little or no improvement, and this led to the introduction of the bi-annual Maternal New-Born Child Health Week (MNCHW) campaign funded by United Nations Children Funds (UNICEF) and the introduction of vitamin A supplements as part of commodities accessed during the National immunization plus days with the aim of improving the Vitamin A status among under-five children, whereby the capsules can be accessed from the health caregivers and also an avenue to create awareness about vitamin A supplementation and other commodities that could be accessed from the health facilities. The recognition of VAD control as a low-cost/high-impact child survival intervention in countries where VAD is endemic led numerous countries in sub-Saharan Africa to launch broad-based, high-potency vitamin A supplementation programs to cover 4–6 months of children's vitamin A needs twice yearly.

1.3 Justification for the Study

In 1990, the elimination of VAD by 2001 was adopted as a goal by the United Nations Children's Fund and reiterated by FAO/WHO in 1992.[42,43] Substantial progress has been made since then but VAD is still prevalent, even though "*very significant progress has been made over the last 15 years*".[44] In May 2002, the United Nations (UN) again called for the elimination of VAD, this time by 2010.[83] Global statistics are available up to 2000 but there is less information available concerning recent developments and supplementation trends.[45] VAD is a public health problem in about 100 countries, but the number of people affected by VAD has been decreasing in the last 20 years.[46, 47]

Forty three (43) countries now have formal supplementation programmes, reaching at least two-thirds of all young children, and 10 countries have virtually eliminated VAD since VAD was identified as a public health problem.[48] In Indonesia, Vietnam, Bangladesh, Nepal and the

Philippines, VAD-induced blindness has been eliminated.[49, 50] For many countries, reductions in VAD can only be estimated by indirect indicators. It is estimated that VAD is still a public health problem today in about 96 to 118 countries, mainly in Africa and South-East Asia.[48, 49] In general, it is acknowledged that VAD is not so much a problem lacking in solutions, but the problem is whether VAD is given enough priority by international, regional and national politicians and policy makers.

Combating VAD requires action at several different levels: on individual/household and on population level; on daily and on long-term basis; with preventative and with remedial treatment

Vitamin A is one of the key micronutrients in human health. Its intake is crucial in determining not only the vitamin A status but also the general nutritional status of children. Effective control of VAD could make a large contribution towards the attainment of the Millennium Development Goal Four (MDG 4) for the reduction of child mortality by two thirds between 1990 and 2015[10] and other specific MDGs.[10]

VAD has been well documented as a long-time public health burden among under-five children,[37,38,39,40,41,42] with a high level of clustering across the communities.[43] Despite the morbidity and long-term consequences associated with VAD, and the successful integration of Vitamin A supplementation into routine immunization schedule,[42] less is known about the coverage of the Vitamin A Supplementation program among under-five children in Nigeria. Understanding the pattern of Vitamin A supplementation program coverage is important for improving the health outcome of children and their survival.

In Umuahia North LGA of Abia State which is one of the major urban LGA in the state and also the capital of the state, there is always paucity of data as regards the effect of vitamin A

supplementation among under-five children, hence this study is necessary to assess the factors affecting the uptake of vitamin A among children aged 6-59 months so as to build a basis for wider interventions, and also aid us in making decision as regards inventory of Vitamin A in the LGA and also proffers solution to why the commodity is not been assessed from the health facilities according to the Routine Immunization(RI) schedule despite the introduction of Vitamin A into this schedule.

1.4 Research Questions

1. What is the level of awareness on vitamin A supplementation?
2. What are the attitudes of mothers regarding vitamin A supplementation?
3. Do the health facilities have vitamin A stocked within the health facilities?
4. What is the coverage of vitamin A among under-five in the study area?
5. What are the factors affecting the uptake of Vitamin A in the study area?

1.5 Objectives of the Study

1.5.1 General objective

To determine the factors affecting the uptake of vitamin A supplements among under-five children in Umuahia North LGA of Abia State.

1.5.2 Specific objectives

1. To determine the level of awareness on information about Vitamin A supplementation among mothers of children 6-59 months.
2. To determine the attitude of mothers towards Vitamin A supplementation.
3. To assess the availability of Vitamin A supplementation in the health facilities over the last two (2) years.

4. To assess the coverage of Vitamin A among children aged 6-59 months in Umuahia North LGA of Abia State.
5. To determine the factors affecting the uptake of Vitamin A supplements among under-children in the LGA

CHAPTER TWO: LITERATURE REVIEW

2.1 Background Information on Vitamin A Supplementation

Vitamin A deficiency was identified as a problem of public health concern in over 60 countries by the WHO. And it was being estimated that about 250 million children are at risk for this deficiency.[44] Vitamin A deficiency is a major nutritional concern in poor societies, especially in low income countries. Africa and South East Asia bear the highest burden of pre-school age children and pregnant women with biochemical vitamin A deficiency and night blindness.[48]

Vitamin A is essential for child survival, proper functioning of the immune system, health, growth and development. Vitamin A deficiency is known to be the leading cause of preventable childhood blindness. Children with even mild or moderate vitamin A deficiency have weaker immune systems and suffer from more respiratory infections, diarrheal diseases, malarial episodes and measles, contributing to an increased risk of death. By meeting the vitamin A needs (through supplementation, fortification or adequate diet) of children under five years in vitamin A-deficient areas, mortality rates in general could be reduced by up to 23 per cent.[49]

Supplementation refers to periodic administration of pharmacological preparations of vitamin A in capsules to groups at risk, mainly to young children.[50] The body can store vitamin A easily in the liver unlike other vitamins. Sufficient vitamin A can be given to children by giving them one, preferably two high-dose capsules per year.[51,52] Vitamin A supplementation is one of the best proven and most cost-effective interventions to improve vitamin A status and save children's as well as the best child survival strategies in areas where vitamin A deficiency exists.[53,54] Vitamin A supplementation involves treating all children from 6-months to 5-years in areas at high-risk for vitamin A deficiency with high-dose vitamin A supplements two or three times per year.[51]

Improving the vitamin A status of the young children can potentially be achieved either directly, through supplementing the new-born with vitamin A capsule, or indirectly, by supplementing the lactating mother in order to increase the vitamin A content of her breastmilk and thus provide additional vitamin A to the breastfed baby. Integrating VAS campaigns with other essential maternal and child health interventions provides maximum efficiency and coverage. This was the reason why Nigeria adopted the millennium development goals (MDGs) calling for a two-third reduction in child mortality, as compared to 1990, the year 2005. In addition to the above, the country ratified the United Nations General Assembly Special Session (UNGASS) goals urging Nigeria to achieve by 2010.

(i) Ensure full immunization of children under one year of age at 90% coverage nationally with at least 80% coverage in every district or equivalent administrative unit, and

(ii) Vitamin A deficiency elimination. Vitamin A supplementation is generally inexpensive on a per head basis. Trials conducted in the 1980s and early 1990s found that vitamin A supplementation greatly reduces child mortality.[55]

2.1.1 Fortification

Food fortification is the enrichment of food products with specific vitamins and minerals, such as vitamin A. Butter, margarine and oil, but also sugar and biscuits, can be fortified with vitamin A. Food fortification is not limited to developing countries alone, but a normal procedure in food production in industrialized countries. About 25 to 50% of additional vitamin A in the diet of the average European now comes from fortified food products.[56] Latin America and the Caribbean are places where routine vitamin A supplementation is uncommon, that is why they rely more on fortified food. Food fortification is good option where people have access to milled or processed food.[57] The majority of people will have some access to flour, sugar, salt, margarine and cooking

oil, which are mostly fortified. The cost of fortification of such products can be as little as a few cents per person per year. Fortification requires the co-operation of food processors, but governments can have some influence on food processing. Food fortification can be effective for school children or other individuals fed from an organized food distribution system.[58]

2.1.2 Effect of maternal vitamin A supplementation on the breastmilk content of vitamin A

The vitamin A concentration in human milk can be increased by high-dose vitamin A supplements[59,60, 61] fortification programs,[62] low-dose supplements,[63] or vitamin A–rich foods.[64] Vitamin A supplementation of the lactating mother increases her own body reserves of vitamin A (which is important for keeping the mother healthy), and potentially, can increase vitamin A in her breast milk to the benefit of the infant and its vitamin A status through the first few months of life. The earlier vitamin A supplementation is given to the lactating mother, the sooner the mother's vitamin A status is raised.

Supplementation of Indonesian mothers with 312 μmol (300,000 IU) of vitamin A at one to three weeks postpartum increased breastmilk vitamin A concentrations significantly (by 0.48 to 1.18 μmol/L) during the period from one to eight months postpartum as compared with a placebo group in and experiment that carried out in Indonesian.[65] Another trial in rural Bangladesh to evaluated the effects of two doses of vitamin A delivered to women at different stages of lactation.[66] The women divided into groups some received one dose of 209 μmol within the first one to three weeks postpartum followed by a daily placebo, others were given daily doses of 14.6 μmol (7.8 mg β-carotene), while the last group received a daily placebos until nine months postpartum. There were no differences in maternal serum retinol concentrations at baseline or at three, six, or nine months postpartum. At three months postpartum, women in the vitamin A group had significantly higher breastmilk retinol concentrations. The other studies in developing

countries also suggest that supplementation of lactating women with â-carotene has relatively little effect on breastmilk vitamin A content.[66]

2.2 Interventions in Controlling Vitamin A Deficiency

Vitamin A supplements meant for prevention of vitamin A deficiency are given by mouth (orally). Improving the vitamin A status of deficient children reduces the severity of infectious illnesses, especially measles and chronic diarrhoea. Since 1997, WHO has advocated the routine administration of vitamin A with measles vaccine in countries where vitamin A deficiency is a problem.[65] A study by Jonathan et al, on safety and impact of vitamin A supplementation delivered with oral polio vaccine as part of immunization campaign in Orissa, India clearly demonstrated that the short-term benefits of vitamin A supplementation are significant, especially in those who are most severely depleted.[93]

Many strategies for control and treatment had been put in place to reduce the prevalence of VAD worldwide. Historically, as early as 3500 B.C, Egyptians treated night blindness and some eye disorders by the topical application of the juice from cooked animal liver to the eye. Ancient Greek physicians also recommended the ingestion of cooked liver as well as its topical application as a cure for night blindness.[48] In a study published in 1881, Snell demonstrated that night blindness and Xerophthalmia could be cured by taking cod-liver oil.[67] In 1990, at the World Summit: WHO/UNICEF and member states committed to eliminate VAD as a public health problem by the year 2000.[65]

The options for prevention and control of this deficiency are: food-based approaches, including dietary diversification, education in proper nutrition and fortification of staple and value-added foods, supplementation of vitamin A: public health interventions such as immunization, adding

vitamin A supplementation to National Immunization Days, promotion of breastfeeding, prompt and adequate treatment of infectious diseases and modification of the environment. Current estimates suggest only 35 countries are on track to reaching VAD elimination goal.[66]

2.3 Benefits in Vitamin A Deficiency Control

Vitamin A has been described as an anti-infectious vitamin because of its role in regulating human immune function.[69] Some recent studies in HIV-positive children have demonstrated reduction or delay in AIDS-related signs and symptoms, prolongation of survival, and no evidence of harmful effects.[71] Early studies in animals and humans revealed an association between VAD and increased susceptibility to infections.[70] In addition to its preventive and therapeutic effect against xerophthalmia,[43] prophylactic VAS in apparently healthy children (over 6 months of age) residing in developing countries may reduce childhood mortality by as much as 30%,[57,72,73] particularly by reducing diarrhoea and measles mortality.

Vitamin A was first reported to play a possible role in reducing the mortality of children from complications of measles so many years ago.[76] As immunization programs have established a delivery system that reaches a large proportion of young children, linking vitamin A supplementation to these programs could be one mechanism to achieve extensive coverage in vitamin A–deficient populations. An informal consultation[75] was convened by WHO's Nutrition Unit and the Expanded Program on Immunizations (EPI) in 1992 to assess the role of using immunization contacts to combat vitamin A deficiency. This recommended, in association with the International Vitamin A Consultative Group (IVACG), delivery of 25,000 IU of vitamin A with each of the first DPT immunizations (scheduled around 6, 10, and 14 weeks) and with measles immunization around 9 months. Among populations in which breastfeeding is common and prolonged, the group also recommended one large 200,000-IU dose to the mother during the

safe period of postpartum infertility (about 60 days). Vitamin A is required for normal functioning of the visual system, maintenance of cell function for growth, epithelial integrity, red blood cell production, immunity and reproduction.[76] Vitamin A deficiency (VAD) impairs body functions and may cause death. Adverse health consequences may also include xerophthalmia (dry eyes), susceptibility to infection, stunting and anaemia.[76,77] Chronic VAD may develop when animal sources and fortified foods are limited, as in diets that rely heavily on vegetables and fruits.[45] In poor societies, especially low income countries, dietary deficiency can begin very early in life, as when colostrum is discarded or when breastfeeding is inadequate.[78]

Vitamin A is an essential nutrient; it cannot be synthesized by the human body and therefore must be obtained through diet.[79] Oral supplementation (VAS) and food fortification are the most direct methods for providing vitamin A to people whose diets are deficient.

Vitamin A deficiency is a well-established risk factor for measles-related mortality. Treating children with high-dose supplements during the course of a measles episode can reduce measles-related deaths and complications by about 66 per cent and is therefore the standard of care for managing the disease.[80] Preventive supplementation programmes are also important for the control of vitamin A deficiency in populations with a high measles burden. As part of the global drive to reduce measles deaths, UNICEF and WHO are concentrating efforts on 47 countries in which more than 95 per cent of measles deaths occur – all of which are vitamin A supplementation priority countries.[81]

Opportunities exist to co-administer high dose vitamin A supplements with the measles vaccine to infants at around nine months of age. For many infants at risk of vitamin A deficiency, this contact is often the first opportunity to receive a vitamin A supplement. Recent efforts to

augment measles vaccine coverage through supplementary immunization activities have also proved effective for delivering vitamin A, enabling countries to reach approximately 70 per cent of targeted children with both interventions.

2.4 Awareness of Mothers on Vitamin A Supplementation

Woman's nutritional status and knowledge on foods have important implications for her health and that of her children. [82] Knowledge and awareness about vitamin A is not sufficient in many investigations by researchers. In a study conducted in India, out of 500 women that were interviewed over a span of 7 months about 41.8% women had no idea about the foodstuffs rich in vitamin A.[83] Also in another study in Ahmedabad it revealed that about 80% of respondents had no knowledge about Vitamin A.[84] While 65% mothers had poor knowledge about Vitamin-A deficiency in Rawalpindi.[85] The knowledge of mothers on the importance of vitamin A is low in Malawi. Exploring the knowledge of mothers on the importance of vitamin A, showed only 12% reported vitamin A helps a person to see while 30.4% knew that it protects from disease (MoH, 2001). There was an association between knowledge of Vitamin-A and good practices, knowledge and attitude, knowledge and practices and knowledge and educational status. In another study the knowledge on vitamin A rich foods among mothers of preschool children was determined by socio-demographic, attitude, service availability and info-communication in relation to mothers in Nepal. It was found out that nearly 91% of the mothers were aware of vitamin A rich foods and grew vitamin A rich foods in their kitchen gardens and took it in their daily meal as diet.[83] This is in contrast to a study done by UNICEF on assessment of vitamin A supplementation programmes in Malawi which show that once mothers of children complete all the schedule routine immunizations, their subsequent visits to the health facilities are only when their children are sick.

2.5 Attitude of Mothers towards Vitamin A Supplementation

Almost one third of children in developing countries are affected to some degree by Vitamin-A deficiency, which impairs their growth, development, vision and immune function, and in extreme cases leads to blindness and death.[49] This may not be unconnected to the low VA knowledge may be expected due to lack of formal education about nutrition and health in developing countries as well as not going to school.[86]

On the other hand, VAD has emerged in several countries in the Pacific region, as a result of rapid changes in lifestyle and the abandonment of traditional dietary and other practices that were protective.[60] As a result of this many measures were developed to educate mothers about nutrition and vitamin A supplementation. Some thee training are community base. These community nutrition education programmes in developing countries are typically designed to foster changes in maternal knowledge and behaviour. It is thought that targeting mothers will have the largest impact on child nutrition and health because mothers spend more time caring for their children than other relatives. Similarly it was discovered in some studies that grandmothers may play an important role in child nutrition and health.[78]

2.6 Coverage of Vitamin A among Children Aged 6-59 months

The coverage rate of vitamin A supplementation in children manages to remain high from 1993 in most countries. This was possible through the integration and the close operational cooperation of vitamin A supplementation and EPI/NIDs programs which have proven to be a powerful way to enhance and sustain both programs.[79] In 2004, approximately 190 million children aged 6–59 months received at least one high-dose vitamin A supplement, representing global coverage of 68 per cent.[79] In about 40 developing countries, vitamin A supplements are given during National Immunization Days or in conjunction with other mass immunization

campaigns.[58,59] In Africa and South-East Asia, this is by far the most common method. More than 40 developing countries are now reaching two-thirds or more of their young children with at least one high-dose vitamin A capsule every year.[56] In Nigeria the proportions of children with VAD differed among the agro ecological zones; were 31.3% in the dry savannah, 24.0% in the moist savannah, and 29.9% in the humid forest (P 0.001). More children with severe deficiency (serum retinol, 0.35 mmol/L) lived in the humid forest (7.1%) than in the dry (3.1%) or moist savannah (2.4%).[63]

In 2010, there were limited data to assess VAS programs in sub-Saharan Africa other than administrative tally sheets, which often reported coverage over 100%. This could be misleading. That was why Helen Keller International (HKI), in collaboration with host governments, came with Post-Event Coverage Surveys (PECS) to validate coverage estimates and generate data about the quality of program implementation.[80] Having valid coverage estimates is critical for monitoring VAS programs and determining whether programs are reaching their objectives. Although measuring coverage using tally sheets is simple and fast, it is highly vulnerable to errors from miscalculations in aggregating data, delayed or incomplete reports, and inaccurate population estimates.[80]

2.6.1 Prevalence of vitamin A deficiency in the first six months of life

Clinical symptoms of vitamin A deficiency rarely occur in breastfeeding infants during the first year of life, even in populations with endemic vitamin A deficiency.[77] For example, in rural Indonesia 1.7% of children zero to five years of age had active xerophthalmia. Out of this figure, only 0.6% was below one year of age, as compared with 3.4% that were one year, 16% were two years, and 26% were three years.[81] More than 90% of the children had been breastfed for at least 12 months of life. Another survey carried in Malawi to checked prevalence and severity of

xerophthalmia, revealed no cases of this condition in infants' age 0 to 11 months, but it affected 37% in the two- to three year- old group. Almost all the children were 100% breastfed for 12 months.[82]

The protective ability of vitamin A in breastmilk may be high but limited. This can be seem in a study in Indonesian children who were not breastfed at one year of age have high chance (76%) of acquiring Bitot's spots as compared with (29%) who were breastfed.[83] In the second year of life, weaned children had an eightfold greater risk of developing Bitot's spots than those who were still being breastfed. In Bangladesh, breastfed children aged 6 to 36 months had a 74% lower risk of clinical vitamin A deficiency compared with those who were not breastfed.[84]

2.7 Determinants of Vitamin A Coverage

The conventional way to estimate VAS coverage achieved by Child Health Days and other campaign-like events is by tally sheets, which compare records of capsules distributed to estimates of the target population based on census data. Tally sheets are simple and fast, but prone to error due to miscalculations in aggregating data, delayed or incomplete reports, and inaccurate population estimates.[34]

Determinants of vitamin A coverage can be better understood with the advent of National Immunization Days in Africa, when vitamin A supplementation programs in sub-Saharan Africa were at best large-scale pilots. NIDs offered an unprecedented opportunity to accelerate the coverage of vitamin A supplementation among children under five, raise the profile of the benefits of vitamin A and nutrition in general, and train thousands of front-line health workers which important determinants of the coverage. The NIDs have been taking place in all countries of sub-Saharan Africa, and by the year 2000 almost all countries included vitamin A

supplementation in NIDs. As a result of this action by these countries the coverage rate was over 80% of children 6-59 months in at least one annual dose.[84, 85, 86, 87]

In India vitamin A supplementation is integrated into mother and child health clinics and community programs in addition to the NIDs programs which are other determinants of vitamin A coverage. These measures of vitamin A supplementation programs in India have reportedly led to high coverage rates for children.[90]

Certain factors might hinder the vitamin A coverage such as: lack of community involvement and social accountability,[89] inadequate supply of vitamin A to areas that hard to reach, or deficiency of other micronutrients in children or pregnant women. In particular, zinc deficiency limits the bio-availability of vitamin A. Combined zinc and vitamin A supplementation have been advocated to improve the vitamin A status of children and pregnant women.[91,92]

CHAPTER THREE: METHODOLOGY

3.1 Study Area

The study was conducted in Umuahia North LGA (UNLGA) of Abia state, the LGA was created in 1996. It is an urban LGA and also located in the capital of Abia state and occupies a vast land mass with a good terrain and a few hard to reach areas, measures about 14,460 sq. km of land mass and is located between latitude 50 30' and 50 40' North of the equator and longitude 70 25' and 70 32' East of the Greenwich meridian.

It is bounded in the North by Isuikwuato and Bende local government areas, to the South by Umuahia South LGA, to the East by Ikwuano and Umuahia South LGAs and to the West demarcated from Imo State by the Imo River.

It has an estimated population of about 280,451 populations with a target population of 50,481 which is 18% of the total population of the local government estimated population.

The LGA has 20 wards with 54 health facilities (one tertiary health institution and one secondary health institution) offering routine immunization services (both Public and Private facilities) with the majority of the population engaging as civil servants, artisans, farmers and businessmen and businesswomen as their major occupation.

In 2011 there was an increased interest and effort to ensure the wellbeing of maternal, new-born and children health led to one hundred percent participation of all the states of the federation in providing vitamin A supplements for their children under-five. The overall coverage in Nigeria has increased from 27% to 57.4% in 2011;[106] while in Abia State the coverage is 66%. Most of the vitamin A used during supplementation campaigns is supplied in gelatin capsules[107] and administered orally for infants and children. Provision of high doses of vitamin A every 6

months until the age of 5 years was based on the principle that a single, large dose of vitamin A is well absorbed and stored in the liver, and then mobilized, as needed, over an extended period of time.[108] A dose of 100 000 International Units (IU) in infants 6–11 months of age and 200 000 IU in children 12–59 months of age is considered to provide adequate protection for 4–6 months, with the exact interval depending on the vitamin A content of the diet and the rate of utilization by the body. [109, 110]

However, there are other routes that the micronutrient can be taken. This include: intramuscularly and intravenously.

3.2 Study Design

Study design is descriptive cross-sectional study.

3.3 Study Population

The study was conducted among mothers with children aged 6-59 months in selected population areas in Umuahia North LGA.

3.3.1 Inclusion Criteria

1. Mothers of children aged 6-59 months living within the selected communities for at least 6 months.
2. Mothers of children aged 6-59 months that consented to participate in the study.

3.3.2 Exclusion Criteria

1. Mothers with very ill children under-five years of age who could not participate in the interview.

3.4 Sample Size Determination

The sample size for this study was determined using the equation,

$$n = \frac{Z^2 \alpha\, p.q}{d^2}$$

Where

n = Minimum sample size

$Z\alpha$ = the standard normal deviate at 5% significance level; 1.96

p = prevalence of 66% was used base on coverage of Vitamin A supplementation among under-five children in Abia state[111]

d = level of precision (5%)

q = 1- p

$$n = \frac{1.96 \times 1.96 \times 0.66 \times 0.34}{0.05^2}$$

n = 345

Adjustment for 15% non-response was made

n = 397

n ≈ 400

3.5 Sampling Technique

A Multi stage cluster sampling technique was employed. All 20 wards in Umuahia North LGA were stratified into three clusters: urban wards, rural wards and mixed (urban/rural) wards.

Stage 1: A simple random sampling technique was employed in the selection of wards in each stratum. Three (3) out of the 6 urban wards were selected, while 4 out of the 8 rural wards were

selected as well. Also 3 wards were selected from the 6 mixed (urban and rural) wards. A total of 10 out of the 20 wards (50%) were sampled. Therefore, Mbaocha, Urban 1 and Urban 3 (urban); Afugiri, Ibeku West, Nkwoegwu and Oriendu (rural); Afara Ukwu, Ibeku East 1 and Isingwu (mixed) wards were selected for the purpose of this study.

Stage 2: Selection of settlements was done at random base on the list of settlements in each wards selected by SRS list as sourced from the Abia State Primary Healthcare Development Agency.

Mbaocha ward: 2 settlements were selected from the 4 settlements in this ward.

Urban 1 ward: 5 settlements were selected from the 12 settlements in this ward.

Urban 3 ward: 8 settlements were selected from 15 settlements in the ward.

Afugiri 1 ward: 4 settlements were selected from the 10 settlements in this ward.

Ibeku west ward: 3 out of the 5 settlements in the ward were selected

Nkwoegwu ward: 4 settlements out of the 9 settlements were selected in this ward.

Oriendu ward: 3 settlements out of the 8 settlements were selected in this ward

Afara Ukwu ward: 3 settlements out of the 8 settlements were selected in this ward

Ibeku East 1 ward: 4 settlements out of the 9 settlements were selected in this ward.

Isingwu ward: 4 settlements were selected from the 10 settlements in this ward

Stage 3: Bottle spinning at settlement center was done to select the direction for the starting point. Contiguous houses were visited until sample size was attained. The breakdown is as follows**:**

- 10 Wards x 40 Settlements = 400 respondents.

3.6 Study Instrument

This included a pre-tested structured interviewer administered questionnaire with mostly closed-ended questions meant to elicit Socio-demographic information of mother/caregiver, Awareness of vitamin A supplementation of mothers/caregivers, Attitude of respondents on Vitamin A supplementation, Acceptability of vitamin A supplement in the communities, and Availability of Vitamin A Supplement in all the selected health centres in Umuahia North Local Government Area (UNLGA).

The questionnaire had five sections and was administered at the household level to the respondents and at selected primary health care centers. These areas include Section A: Socio-Demographic Data of Respondents, Section B: Awareness and Knowledge of Vitamin A Supplementation by the respondents, Section C: Attitude of respondents on Vitamin A supplementation, and Section D: Coverage on Vitamin A supplementation.

3.7 Data Collection Methods

The data was collected using a structured interviewer administered questionnaire for mothers in the selected population areas while the checklist was used to collect information on availability of vitamin A supplementation from health workers in all the selected health facilities in Umuahia North LGA.

Interviewers (Research Assistants) were recruited among National Youth Service Corps (NYSC) members in the health profession who have UNLGA as their primary place of assignment and School of Nursing/Midwifery students in the state.

The research assistants (5 research assistants) were trained on:

1. Interview skills and Communication skills.

2. Community entry skills.
3. Definition of Nursing Mother, Mother and Caregivers.
4. Translation of the questions into Igbo and English languages.
5. Criteria for the selection of Nursing Mothers, Mothers and Caregivers and Children.
6. Pre-testing.
7. Selection of starting point and subsequent ones for interviews using the bottle spinning for direction.

The role of the researcher was to carry out supportive supervision during administration of the questionnaire and training the research assistants.

3.8 Pre-Testing

The survey instrument (questionnaires) was pre-tested in Umuahia South LGA, to identify potential problem areas. Twenty questionnaires were administered during the pre-testing, questions found to be unclear or unnecessary were modified to create reliability and validity of the questionnaires, and also skip options were applied accordingly.

3.9 Data Management

Data was analyzed using Epi-Info version 7.0 statistical software package (CDC Atlanta Georgia USA). Descriptive statistics using absolute numbers for Univariate (simple percentages, range and measures of central tendency (mean, median) were used as appropriate. Also bivariate and multivariate analysis were done to determine associations and relationships between variables and $p \leq 0.05$ were considered statistically significant.

3.9.1 Scoring of Knowledge and Attitude

Knowledge was ranked and a score of one was allotted to each correct response to a question while score (0) for wrong answer to a question. Marks were allocated based on the discretion of the interviewer per question. Each question carries equal marks. The scores was then entered accordingly in Microsoft excel and stored for analysis. A total score <10% was considered as poor, 11% to 20% was considered average, 21% to 30% was considered to be good while >30% and above was considered to be very good.

In grading Attitude, <9% was considered poor, 10% to 19% was considered to be good while >29% was considered to be very good.

3.9.2 Determination of coverage

Coverage was estimated base on the tally sheets or immunization cards records of the respondents. Oral records of mother/caregivers in place of missing cards was considered. The formula below was used to calculate coverage in the study area:

$$\textbf{Coverage of Vit A For U-5 Children (\%)} = \frac{\textbf{Number of children 6-59 months who received vitamin A in a given period}}{\textbf{Estimated total target population of children 6-59 months}} \times 100$$

3.10 Ethical Consideration

Ethical clearance was collected from the Ethical and Research Committee of the Ministry of Health, Abia State. Individual informed consent (written) was obtained from participating mothers and confidentiality was maintained during and after the research.

Participation in the study was optional and the participants were free to stop participating during the course of the study.

3.11 Limitation of the Study

1. Only mothers/caregivers that attend the R.I clinic were captured and the prevalence estimated may not be the true population prevalence.

2. Some of the research assistants recruited had issues communicating in local dialects.

CHAPTER FOUR: RESULTS

A total of 400 respondents from different communities in selected wards in Umuahia North LGA, Abia State were included in the study. Similarly, ten Health Care Workers from the ten selected health facilities (ward health centers) in the Local Government were also included. All tables referred to in this chapter were computed from the data collected from the field response rate.

4.1: Univariate Analysis

Table 1: Socio-demographic characteristic of respondents

Variables	Frequency (n= 400)	Percent (%)
Age (Years)		
15-19	15	3.8
20-24	30	7.5
25-29	109	27.3
30-34	115	28.8
35-39	87	21.8
40-44	25	6.3
45-49	14	3.5
50-54	5	1.2
Mean age 31.5±SD 6.55		
Sex		
Female	384	96.0
Male	16	4.0
Tribe		
Igbo	330	82.5
Hausa	43	10.8
Yoruba	27	6.8
Religion		
Christianity	364	91.0
Islam	36	9.0
Marital status		
Married	369	92.0
Singled	21	5.2
Divorced	5	1.2
Widowed	5	1.2
Parity		
1	101	25.3
2	128	32.0
3	83	20.8
4	48	12.0
5	21	5.3
>5	19	4.8
Level of education		
Non formal education	21	5.3
Primary education	49	12.3
Vocational	16	4.0
Secondary	121	30.3
Tertiary	193	48.3
Occupation		
Teacher	42	10.5
Clerical staff	70	17.5
House worker	83	20.8
Business woman	109	27.3
Others	95	23.8

The age range of mothers/caregivers is from 15-54 years. Their mean age was 31.5 (±0.32 SEM). Majority of the respondents were female, married and from Igbo tribe extraction, 382 (96.0%), 365(92.0%), 327 (82.3%) respectively. Christianity is the main religion of the mothers/caregivers 365 (90.8%).

The youngest mother interviewed was 18 years while the oldest mother interviewed was 50 years. The mean age of mothers was 31.5years while the median age was 31 years. Standard Deviation of the age was 6.67 years.

Table 2: Socio-demographic characteristic of under-five children

Variables	Frequency (n= 400)	Percent (%)
Age (months)		
6-11	145	36.3
12-23	116	29.1
24-35	68	17.0
36-47	47	11.8
48-59	23	5.8
Mean 26.4 ± SD 14.4		
Sex		
Male	189	47.4
Female	210	52.6
Tribe		
Igbo	341	85.5
Hausa	38	9.5
Yoruba	20	5.0
Religion		
Christianity	369	92.5
Islam	30	7.5

The age range of the children are from 12-59 months. Their mean age was 26.4 (±0.32 SEM). Majority of the children were Igbo 341 (85.5%) while a slight majority of them were female 210 (52.6%).

Table 3: Availability of vitamin A in health facilities

Variable	Frequency (n= 10)	Percent (%)
Vitamin A stocked within the facility	10	100
Had a stock-out of Vitamin A	10	100
Periods of out of stock exceeding 1 month	5	50
Placing requisition for Vitamin A immediately you are out of stock	10	100
Re-stocked within a month following requisition	5	50
Government is the only provider of this capsule within this facility	10	100
Site is organized for children to receive Vitamin A before vaccination	5	50

The selected health workers proved they have had vitamin A in stock within this facility. Also they reported that they had run out of stock at certain times and 50% of them go out of stock for a period that exceed 1 month. All of them placed requisition for Vitamin A immediately when they are out of stock. But only 50% got re-stocked within a month following requisition. Government is the only provider of vitamin A capsule in the health facilities. From the data analysed, 50% of the facilities do not organized the site for children to receive Vitamin A before vaccination.

Table 4: Awareness scores among mothers of under five children

Variables	Grading of awareness scores			
	Poor (1-10)	Average (11-20)	Good (21-30)	Very good (>30)
Age (yrs)				
15-19	0	3	5	7
20-24	0	2	13	10
25-29	4	8	49	40
30-34	4	26	70	60
35-39	12	1	33	18
40-44	0	11	6	5
45-49	1	0	6	2
50-54	0	3	1	0
Marital status				
Married	36	23	200	112
Single	2	3	0	8
Divorced	0	7	3	0
Widow	4	0	2	0
Educational status				
None formal education	4	3	5	3
Primary	15	6	22	7
Vocational	0	2	8	2
Secondary	5	10	50	48
Tertiary	2	4	60	144
Occupational status				
Teacher	1	6	22	12
Clerical staff			21	22
House worker	32	34	40	68
Business woman	13	29	30	23
Others	3	6	24	14

The ranking of awareness scores among selected socio-demographic characteristics of respondents shows that awareness is slightly above average.

Table 5: Knowledge scores among mothers of under-five children

Variables	Grading of knowledge scores			
	Poor (1-10)	Average (11-20)	Good (21-30)	Very good (>30)
Age (yrs)				
15-19	0	3	5	7
20-24	0	2	13	10
25-29	4	10	61	49
30-34	4	26	64	60
35-39	12	1	22	18
40-44	0	5	6	5
45-49	1	0	6	2
50-54		3	1	0
Marital status				
Married	34	23	172	147
Single	2	3	0	8
Divorced	0	2	3	0
Widow	4	0	2	0
Educational status	0	0	0	0
None formal education	4	3	5	3
Primary	15	6	22	7
Vocational		2	8	4
Secondary	5	8	45	48
Tertiary	9	8	60	138
Occupational status				
Teacher	1	6	22	12
Clerical staff	0	0	10	10
House worker	32	34	40	68
Business woman	13	29	30	21
Others	1	6	22	12

The ranking of knowledge scores among selected socio-demographic characteristics of respondents shows that knowledge was good.

Table 6: Attitude scores among mothers of under five children

Variables	Grading of attitude scores			
	Poor (0-9)	Moderate (10-19)	Good (20-29)	Very good (>29)
Age (yrs)				
15-19	3	6	6	0
20-24	4	25	9	0
25-29	4	45	38	21
30-34	7	56	28	22
35-39	9	47	20	10
40-44	4	11	4	4
45-49	2	4	9	2
50-54	0	0	0	0
Marital status				
Married	36	23	200	112
Single	2	3		8
Divorced	0	7	3	0
Widow	4	0	2	0
Educational status	0	0	0	0
None formal education	1	3	16	2
Primary	10	6	22	9
Vocational	2	2	8	2
Secondary	2	10	80	0
Tertiary	2	7	56	160
Occupational status				
Teacher	0	6	10	22
Clerical staff	0	8	33	12
House worker	32	34	35	66
Business woman	13	29	23	30
Others	3	6	24	14

The ranking of attitude scores among selected socio-demographic characteristics of respondents shows that attitude was moderate.

Table 7: Coverage of Vitamin A supplementation among under-five children

Variables	Frequency (n= 400)	Percent (%)
The child's card vaccinations records		
Yes	342	85.3
No	58	14.5
Presence of vaccination record		
Seen by interviewer	273	68.1
Not available/lost/misplaced	91	22.7
Never had a card	26	6.5
Do not know	10	2.5
The child had received a vitamin A capsule/supplement		
Yes	233	58.1
No	167	41.6
The number of doses received		
1 dose	118	29.4
2 dose	165	41.1
3 dose	32	8.0
4 dose	13	3.2
More than 4 doses	72	18.0
When the last dose was received		
Less than 6 months ago	157	39.2
6 – 12 months ago	136	33.9
More than 12 months ago	70	17.5
Do not know	37	9.2
Where the child received the last Vitamin A dose		
Taken to Health Center for that purpose	231	57.6
During Campaign	70	17.5
When child was sick and taken to health center	33	8.2
By home visitors /community	33	8.2
Do not know	24	6.0
Others	9	2.2
Instructed to come next time for another dose		
Yes	307	76.3
No	91	23.7

Most (85.3%) of the respondents say they have vaccination cards for their children but only 68.1% of them could show their cards to the interviewers while 22.7% reported that it was misplaced. Analyzed data shows that 58.1% was the percentage of those of those who reported that their children had received vitamin A capsule/supplement while 39.2% of the respondents reported that their children have taken the last dose less than six months ago. It also shows that 57.6% of respondents reported also that they went to health facility to obtain the supplement and were given instruction to come back for the next dose (76.3%) but about 42.9% of them who went back reported that there was no vitamin A supplement in the facilities.

4.2: Multivariate Analysis

Table 8: Multivariate logistic regression analysis to assess association between some demographic variables and categorised knowledge scores of respondents

Categorised knowledge scores	Yes: AOR(95% CI)	No: AOR(95% CI)
Age		
<20	2.55 (0.602-22.860)	1.510 (0.092- 3.661)
20-40	3.55 (0.602-27.560)	0.510 (0.124-12.311)
>40		
Marital status		
Married	1.55 (0.602-28.460)	1.010 (0.871- 1.451)
Single		
Divorced		
Widow		
Educational status		
None formal education	3.55 (0.602-27.560)	0.510 (0.124-12.311)
Primary		
Vocational		
Secondary		
Tertiary		
Occupational status		
Teacher	23.972(1.331-431.705)	0.042 (0.002-0.751)
Clerical staff		
House worker		
Business woman		
Others		

AOR = Adjusted odd ratio, CI = Confidence interval

Mothers within the age range of 20-30 years have more chances of having better awareness on vitamin A supplementation than those of lower age. Similarly, married mothers are having a better awareness than those that are not. But those mother who had no formal education have lower awareness than those that have higher education.

Table 9: Multivariate logistic regression analysis to assess association between some demographic variables and categorised knowledge scores of respondents

Categorised knowledge scores	Positive: AOR(95% CI)	Negative: AOR(95% CI)
Age (yrs)		
<20	2.55 (0.602-22.860)	1.510 (0.092- 3.661)
20-40		
>40		
Marital status		
Married	6.276 (0.315-125.104)	0.159 (0.008-3.177)
Single		
Divorced		
Widow		
Educational status		
None formal education	23.972(1.331-431.705)	0.042 (0.002-0.751)
Primary		
Vocational		
Secondary		
Tertiary		
Occupational status		
Teacher	1.55 (0.602-28.460)	1.010 (0.871-1.451)
Clerical staff		
House worker		
Business woman		
Others		

AOR = Adjusted odd ratio, CI = Confidence interval

Mothers within the age range of 20-30 years have more chances of having better knowledge on vitamin A supplementation than those of lower age. Similarly, married mothers are having a better knowledge than those that are not. But those mother who had no formal education have lower knowledge than those that have higher education concerning vitamin supplementation.

Table 10: Multivariate logistic regression analysis to assess association between some demographic variables and categorised attitude scores of respondents

Categorised knowledge scores	Good: AOR(95% CI)	Poor: AOR(95% CI)
Age (yrs)		
<20	7.631 (0.775-75.162)	0.131 (0.013-1.291)
20-40	3.55 (0.602-27.560)	0.510 (0.124-12.311)
>40		
Marital status		
Married	6.944 (0.372-129.787)	0.144 (0.008-2.691)
Single		
Divorced		
Widow		
Educational status		
None formal education	17.584 (0.745-415.023)	0.057 (0.002-1.342)
Primary		
Vocational		
Secondary		
Tertiary		
Occupational status		
Teacher	6.944 (0.372-129.787)	0.144 (0.008-2.691)
Clerical staff		
House worker		
Business woman		
Others		

AOR = Adjusted odd ratio, CI = Confidence interval

Mothers within the age range of 20-30 years have more chances of having better attitude on vitamin A supplementation than those of lower age. Similarly, married mothers are having a better attitude than those that are not. But those mother who had no formal education have lower attitude than those that have higher education concerning vitamin supplementation.

Table 11: Association of children socio-demographic characteristics with coverage of Vitamin A supplementation

Characteristics	Do you have a card where your child		Odds ratio	95% Confidence Interval
	Yes N (%)	No N (%)		
Age (Months)				
6-11 months	40.7	10.5		
12-23 months	17.3	4.0	15.97	0.03*
24-35 months	12.2	0		
36-47 months	5.3	5.0		
48-59 month	2.0	7.5		
Sex				
Male	38.3	9.3	7.26	0.007*
Female	47.3	5.3		
Tribe				
Igbo	73.5	12.0		
Hausa	9.0	0.5	11.12	0.004*
Yoruba	3.0	2.0		
Religion				
Islam	7.3	0.3	4.42	0.036*
Christianity	78.3	14.3		

*=Indicate statistical significance

The presence of child's card available was significantly associated with child's socio-demographic characteristics as indicated above.

Table 12: Association of child's socio-demographic characteristics with coverage cont

Characteristics	Has this child ever received a vitamin A capsule/supplement		Odds ratio	95% Confidence Interval
	Yes N (%)	No N (%)		
Age (Months)				
6-11 months	20.6	10.6		
12-23 months	10.6	5.6	13.44	0. 009*
24-35 months	15.2	5.6		
36-47 months	5.7	19.0		
48-59 month	5.7	12.0		
Sex				
Male	26.8	20.8	0.55	0.456
Female	31.5	21.0		
Tribe				
Igbo	47.3	38.3		
Hausa	7.5	2.0	9.71	0.008*
Yoruba	3.5	1.5		
Religion				
Islam	5.5	2.0	3.18	0.074
Christianity	52.8	39.8		

* =Indicate statistical significance

The possibility of the child receiving vitamin A capsule was significantly associated with child's socio-demographic characteristics as indicated.

Table 13: Variables significantly associated with uptake of vitamin A supplementation

Variable	Knowledge Visit to clinic		Attitude Lack of Vit A		Coverage Card	
	χ^2	P value	χ^2	P value	χ^2	P value
Age (months)	46.70	0.015*	100.28	0.001	42.73	0.034*
Tribe	27.67	0.002*	NA		8.35	0.015*
Religion	16.41	0.035*	NA		4.38	0.036*
Marital status	29.28	0.015*	NA		21.04	0.012*
Parity	208.37	0.001*	32.20	0.04*	35.78	0.023*
Educational Status	53.24	0.011*	NA		17.559	0.02*
Occupation			28.98	0.001	11.61	0.04*

***=** Indicating statistical association (Pearson Chi-Square)

The results indicated a significant association between the awareness and knowledge, attitude and coverage with some selected socio-demographic characteristic of respondents using Pearson Chi-Square.

Table 14: Variables not significantly associated with uptake of vitamin A supplementation

Variable	Awareness Visit to clinic		Attitude Lack of vit A		Coverage Card	
	χ^2	P value	χ^2	P value	χ^2	P value
Age(Yrs)	NA		NA		NA	
Sex	0.23	0..630	0.979	0.613	0.027	0.868
Tribe	0.34	0.843	2.48	0.648	5.27	0.509
Religion	0.77	0.380	1.49	0.473	0.51	0.472
Marital status	3.53	0.317	6.86	0.334	0.32	0.956
Parity	5.23	0.631	21.69	0.085	NA	
Educational Status	NA		8.50	0.386	NA	
Occupation	32.46	0.145	12.25	0.26	NA	

*=Indicating statistical association (Pearson Chi-Square)

The results indicated a non-significant association between the awareness and knowledge, attitude and coverage with some selected socio-demographic characteristic of respondents using Pearson Chi-Square

Table 15: Multivariate logistic regression (backward stepwise Wald) with socio-demographic Characteristics as the dependent variable

Variables	Odd ratio	95% C.I. for odds ratio		Wald	P value
		Lower	Upper		
Age(Yrs)	1.346	0.714	1.346	4.45	0.035*
Sex	4.910	0.872	4.910	3.87	0.782
Tribe	6.110	0.110	6.110	2.39	1.802
Religion	4.238	0.378	4.238	11.16	0.982
Marital status	0.727	0.012	0.727	0.254	0.394
Parity	1.838	0.005	1.838	2.629	0.175
Educational Status	0.727	0.609	0.727	0.262	0.048*
Occupation	0.606	6.310	0.012	0.017	0.606

* = Indicating statistical association (backward stepwise Wald)

Women that are greater than 33 years of age (OR 1.3 p= 0.035) of respondents were associated with higher odds of the factors of vitamin A supplementation uptake compare with women of lower age. Also this is statistically significant. The Igbo respondents has higher odds (OR 6.1 p= 1.8) of the factors of vitamin A supplementation uptake compare with other tribe but this is not statistically significant. The educational status of respondents (those with tertiary education) was statistically significant but lower odd.

CHAPTER FIVE: DISCUSIONS

This chapter presents the discussion of the findings from the survey conducted among 400 mothers/caregivers of children 6-59 months in Umuahia North LGA, Abia State. The study explored the socio-demographical characteristics of the respondents, awareness and knowledge of respondents, attitudes and practices, availability of vitamin A in health facilities and the coverage of vitamin A within the study area.

The mean age of mothers was 31.5 (SD=6.67) years while that of their children was 26.4 (SD= 14.6) months. The mean age falls within the reproductive stage of the women. This finding agrees with a similar study done in Nepal where half the women interviewed were within reproductive age[3]. Majority of the respondents were married women (92%). This is possible because unmarried women in Africa may be inclined to feel stigmatized when they present their children in public display. To be recruited in this type of survey therefore may be difficult for such category. The findings also revealed that a good number of the respondents 31.9% preferred to have a small size family with two children. This may not be unconnected to the present socio-economic situation of the day.

The religion of the respondents reflected the two dominant religions in Nigeria with 91% Christians and 9% Muslim, which is another reflection of the dominant religion in the South East. Similarly, majority of the respondents are Igbo (82.5%) which is also true of the people in that region.

The educational status of the respondents was impressive as only 5.3% of them do not have any formal education. This is encouraging even though the literacy level in the South East is high. It is believed that low educational level of women tend to put their children at risk of health

hazards.[115] About 48.3% have a tertiary education which then made it possible for them to easily comprehend health education messages delivered to them. In this way they can understand health workers messages on benefits and sources of vitamin A. In addition, they can read posters and pamphlets explaining immunization schedules, vitamin A schedules and other important child care messages. The occupation of the respondents also shows that house workers (20.8%) and businesswomen (27.3%) were the major occupations, given the unemployment status in the country. Therefore, since these respondents who were mothers, house-workers and business women were dependent solely on their spouses to provide money for their essential basic needs like food, shelter, clothing, health etc. it may affect the uptake of vitamin A supplementation.

The socioeconomic characteristic of the children also have some semblance of the mothers/caregivers characteristics. The result shows the age range of the children was from 12-59 months and the mean age was 26.4 ± (SD 14.4). Majority of the children were Igbo 341 (85.5%) while a slight majority of them were female 210 (52.4%). Also the result indicated that most of the children were toddlers or about to start formal education.

The result of the survey has shown that level of awareness was slightly above average while knowledge of vitamin A supplementation among respondents was good. The awareness and knowledge scores indicated the following results: 90%, 59.6%, 65.3% and 43.6% on any relevant information on vitamin A supplementation causes deficiency, signs and symptoms of deficiency and measures of prevention of vitamin A deficiency respectively. The increased in awareness and knowledge may be attributed to increased activities in relation to VAS such as Child Health days and VAS campaigns in the country. It could also be attributed to increased health education messages delivered at health facilities by health workers or due to the high literacy level of the respondents. Those that have heard about vitamin A supplementation got their news majority

from the health workers were 52.1% while others from the radio/television were 24.7% and other sources. About 63.6% of the respondents knew the first dose of vitamin A supplement should be given at six months of age. There was a significant association between the mean knowledge scores and the age range of respondents (ANOVA= 41.96, p= 0.026). Also there was an association between the mean knowledge scores and the tribe of respondents but it was not statistically significant. May this is because majority of the respondents were predominantly Igbo. This result is not in agreement with other report done in Pakistan where it was shown that knowledge of Vitamin A and Vitamin A Deficiency among mothers was low. [119, 120]

The reason for this increased awareness on vitamin A is not difficult to understand. This is because all the health workers in the health facilities visited reported that they did give the parents message after receiving vitamin A supplementation. Even though, there was inadequacy of health care workers within some of the communities visited as half of them had less than 8 staff in their facilities. Some of them said they were able to organized vitamin A campaign and sensitized people on the importance of the supplementation. The result has also demonstrated that the site were organized for children to receive Vitamin A before vaccination in half the number of the health facilities visited. But this is different in other climes as shown in a study conducted in Sierra Leone which show that following a vitamin A campaign, there was an increase in knowledge of mothers on vitamin A from 68% to 95% between 2004 and 2005.[116]

Another study done in South Africa demonstrated that there was an increased in awareness about vitamins A and C than the other vitamins because of information the people got from the health centers.[117] Another study in Vietnam also confirmed an increase in coverage after health education of the mothers.[118]

There was moderate attitude of the respondents towards vitamin A supplementation generally. The attitude scores indicated a respondents' responses of 56.6%, 60.6%, 55.1%, 52.6% on how serious the lack of vitamin A is seen, difficulty in preparing meals rich with vitamin A foods and how they like the taste of the meals respectively 48.9% of the respondent thinks that lack of vitamin A can be seen in the body. The higher the age of respondent the better the attitude score.

The attitude demonstrated the good health seeking behavior of respondents where treatment for illness is rated second than prevention of it. There is a need therefore, for health professionals to increase in designing programs that will encourage mothers to see preventive activity as important as curative activity. There was an association between mean attitude score of respondents with educational status but it was not statistically significant.

The responses of health care workers in the health facilities visited indicate that all of them do administer Vitamin A routinely in their facilities. All reported that they have had vitamin A in stocked within their facility and had ran out of stock at certain times. About 50% of them go out of stock for a period that exceed 1 month. All of them placed requisition for Vitamin A immediately when they are out of stock. But only 50% got re-stocked within a month following requisition. Government is the only provider of vitamin A capsule in the health facilities. About 50% of the facilities do not organized the site for children to receive Vitamin A before vaccination.

The coverage of vitamin A supplementation in the study area was 58.1% which was determine by the report of mothers/caregivers of their children who have received vitamin A capsule/supplement as against those that have not through the evidence of vaccination cards or oral recalled. Children lower than 33 months of age have higher odds (OR=15) of receiving

vitamin A supplementation than those above (p= 0.03). Also Igbo children have higher odds (OR=11) of receiving vitamin A supplementation than those of other tribes (p=0.004).

In the multivariate analysis the factors that came out to be predictors for poor update of vitamin A include, the age of the mother/caregiver: Women that are greater than 33 years of age (OR 1.3 p= 0.035) of respondents were associated with higher odds of the factors of vitamin A supplementation uptake compare with women of lower age. Also this is statistically significant. The tribe: The Igbo respondents has higher odds (OR 6.1 p= 1.8) of the factors of vitamin A supplementation uptake compare with other tribe but this not statistically significant. The educational status of respondents (those with tertiary education) was statistically significant but lower.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The study has shown that there was an average level of awareness and knowledge on vitamin A supplementation in the study area. This was attributed to the positive attitude of the respondents toward vitamin A supplementation to their children and their understanding of vitamin A rich foods. Also, vitamin A coverage was determined in the study area. The vitamin A coverage in the study was similar though slightly below the national figure for Abia State of 66% as shown in the National demographic report of 2013. There were certain predictive factors that determine the outcome of the study objective. These include the age of the respondents, gender, tribe, marital status, parity and the educational status.

6.2 Recommendations

1. There is need for the state government to make adequate provision of the vitamin A by making sure stock out of the supplements are avoided at all times in registered private and government health facilities within the study area
2. There is a need for better education of mothers/caregivers on the medical effect of vitamin A deficiency especially on the eye health by partners like WHO, UNICEF and program officers on nutrition during monthly immunization reviews, OIC meetings and campaigns.
3. There is a need for better training of health workers on documentation of health charts by nutritional focal persons and partners during supportive supervision.
4. There is need for regular vitamin A health campaign on vitamin A within communities by the state government through the bi-annual maternal new-born child health week

5. Community participation should be encouraged by state government and other key stakeholders involving the religious leaders, traditional leaders, local organizations during programs/activities of nutrition or activities targeted for under-five children since women believe so much in them

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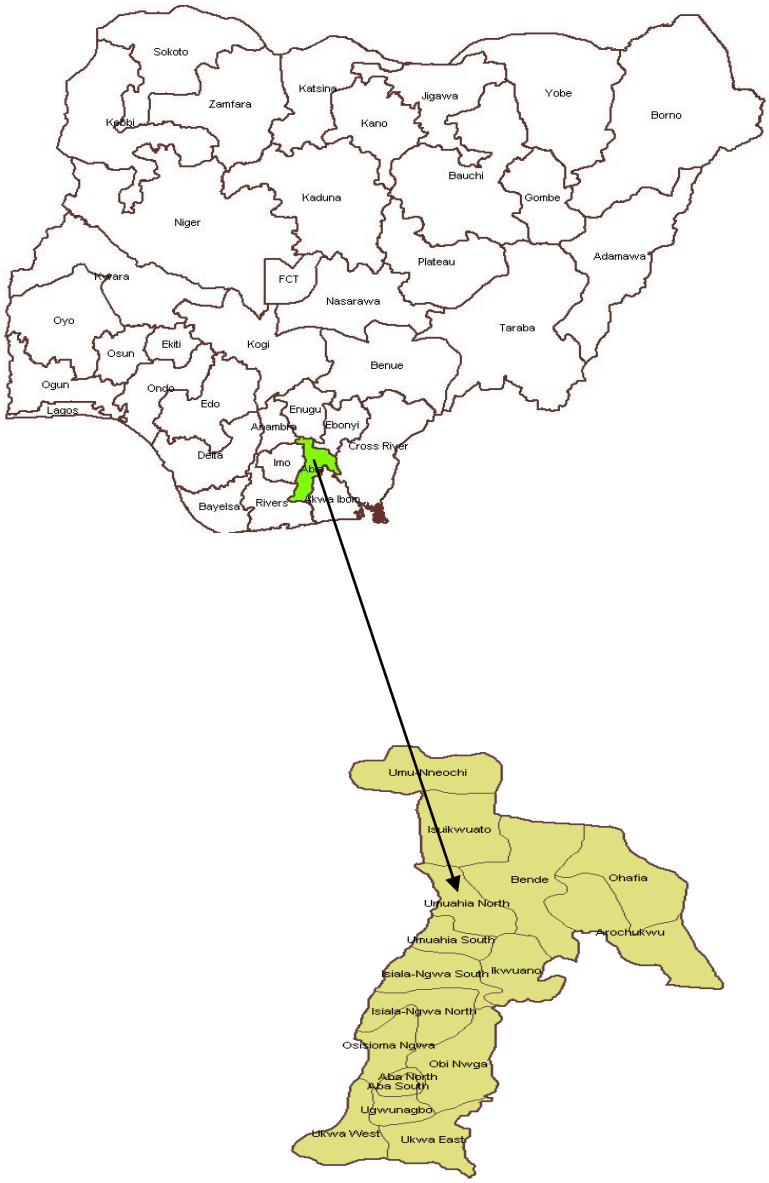
APPENDICES

Appendix 1



Appendix I: Map of Nigeria showing Abia State indicating Umuahia North LGA

Appendix II

Consents Form

Ward……
settlement……
Questionnaire No…….
Mothers/Caregivers consent

Good morning, my name is…….. The researcher (Dr. Okezue Godwin Chukwudike) is currently pursuing a Masters degree in Public Health in the Department of Community Medicine, Ahmadu Bello University, Zaria. This research is to determine the Factors Affecting the Uptake of Vitamin A Supplements among Under-five Children in Umuahia North LGA, Abia State

We would very much appreciate it if the information on your child/ward is covered in this survey. The findings of this research will help us to plan for a better health services in Umuahia North LGA, Abia State. The survey questionnaire will not take more than 20 minutes of your time.

Confidentiality

We will not disclose your child's details to anyone. All records will be kept at Ahmadu Bello University, Zaria.

Appendix III

QUESTIONNAIRE

FACTORS AFFECTING THE UPTAKE OF VITAMIN A SUPPLEMENTS AMONG UNDER-FIVE CHILDREN IN UMUAHIA NORTH LGA, ABIA STATE

This questionnaire has been designed to seek opinions of mothers and PHC workers with regard to determine the factors affecting the uptake of vitamin A supplements among under-five children in Umuahia North LGA, Abia State. It is worth noting that any information provided by you the respondents shall strictly be treated as confidential and shall be used only for academic purposes. Tick as appropriate please.

Section A: Socio-Demographic Data of Respondents

1. How old are? { }
2. Sex? a) Female { } b) Male { }
3. Tribe? a) Hausa { } b) Igbo { } c) Yoruba { } c) Others specify.....
4. Religious affiliation? a) Christianity { } b) Islam { } c) Traditional { }
5. Marital status a) Married { } b) Single { } c) Divorced { } d) Widower { } e) Separated { }
6. Parity no { }
7. Level of education { }a) No formal education { } b) Primary education { } c) Vocational { } d) Secondary education { } e) Tertiary education { }
8. What do you do for a living?

a) Teacher { }b) Clerical staff { } c) House worker { } c) Housewife { } d) Business woman { } e). Others specify _____

9. How old is your child?
10. What is the sex of your child? a) Less than Six Months { } b) six months { } c) One Year { } d) Two Years { } e) Two years { } f) Greater than two but less than five years { }
11. What is the tribe of your child? a) Igbo { } b)Hausa { } c) Yoruba { } d) Others specify.....
12. What is the religious affiliation of your child? a) Christianity { } b) Islam { } c) Traditional { }

13. What is the level of education of your child? a) Yet to start school { } b) Pre-nursery{ } c) Nursery { } d) Primary school { }

Section B: Awareness and Knowledge of Vitamin A Supplementation among Respondents

1. Have you heard about vitamin A deficiency or lack of vitamin A? Yes { } No { }

2. If Yes:Can you tell me how you can recognize someone who lacks vitamin A in his or herbody?

a) Weakness/feels less energetic{ } b) Be more likely to become sick (less immunity to infections { } c) Eye problems: night blindness (inability to see at dusk and in dim light), dryeyes, corneal damage, blindness{ } d) Other{ } e) Don't know{ }

3. What causes a lack of vitamin A in the body?

a) Poor variety of foods{ }b) Eat too little food/not eat much (poor intake){ }c) Other{ }

d) Don't know{ }

4. How can one prevent a lack of vitamin A in the body?

a) Eat/feed vitamin-A-rich foods – having/giving a diet rich in vitamin A{ }

b) Eat foods fortified with vitamin A{ } c) Give vitamin A supplements/sprinkles{ }

d) Others { } e) Don't know{ }

5. Can you list examples of foods rich in vitamin A? (**Probe if necessary**: **Do you know of any animal-source foods, vegetables or fruits that are rich in vitamin A?)**

a) Animal-source foods such as:

- ✓ Liver { }
- ✓ Kidney { }
- ✓ Heart { }
- ✓ Egg yolks/egg from chicken, duck, guinea fowl or other bird { }
- ✓ Milk, cheese, yogurt or other dairy product { }

b). Orange-coloured vegetables such as

- ✓ Orange sweet potato { }
- ✓ Carrot { }
- ✓ Pumpkin { }
- ✓ Squash { }

c) Green vegetables

- ✓ Amaranths { }
- ✓ spinach { }
- ✓ cassava leaves { }
- ✓ kale and other green leafy vegetables { }

d) Fruits (orange- or yellow-coloured non-citrus fruits)

- ✓ Ripe mango { }
- ✓ Ripe papaya { }
- ✓ Dried peach { }
- ✓ Red palm oil { }

e) Foods fortified with vitamin A

- ✓ Margarine (Butter) { }
- ✓ Bleach oils { },
- ✓ Salt { }
- ✓ Sugar { }

f) Other foods

- ✓ Breastmilk (for infants 0–6 months) { }

h) Don't know{ }

Section C: Attitude of mothers on Vitamin A supplementation

1.Do you think your child is lacking vitamin A in his/her body?

a) Not likely{ } b) You're not sure{ } c) Likely{ }

2. If Not likely:

Can you tell me the reason why it is not likely?

_____

3. How serious do you think a lack of vitamin A is?

a) Not serious{ } b). You're not sure{ }

c). Serious{ }

4. If Not serious:

Can you tell me the reason why it is not serious?

5. How good do you think it is best to prepare meals with vitamin-A-rich foods such ascarrots, green leafy vegetables, sweet potatoes or liver? a) Not good{ } b). You're not sure{ }

c). Good{ }

6. If Not good:

Can you tell me the reasons why it is not good?_____

7. How difficult is it for you to prepare meals with vitamin-A-rich foods?

a) Not difficult{ } b)Ok c) Difficult

8. If Difficult:

Can you tell me the reasons why it is difficult?_____

9. How confident do you feel in preparing meals with vitamin-A-rich foods?

a) Not confident{ }

b) Ok { }

c) Confident{ }

10. Can you tell me the reasons why you do not feel confident?_____

11. How much do you like the taste of [insert a vitamin-A-rich food item or meal]?

a) Dislike{ } b) Neutral{ }c) Like{ }

Section D: Coverage on Vitamin A supplementation

1. Do you have a card where your child's vaccinations are written down?

a) Yes { } b) No { }

2. If yes; may I see it please?

a) Seen by interviewer { }b) Not available/lost/misplaced { }c) Never had a card{ }d) Don't know{ }

3. Check card and record all vaccines received

a) BCG { }b) DPT1 { }c) DPT2 { } d) DPT3 { }e) Polio 1 { }f) Polio 2{ } g) Polio 3 { } h) Measles { } i) Vitamin A { }

4. When was last recorded vaccine received

a)Less than 6 months ago. b) 6 – 12 months ago. c) More than 12 months ago d) Do not know

Thank you for participating!

Appendix IV

Checklist for Health Care Workers

Instructions

This checklist is to assess the availability and other relevant information on vitamin A supplementation in your health facility. Any information you provided will be treated with utmost confidentiality and be used for academic purposes only.

Name…… Date……

Health facility…… State……..

LGA…….Ward……

S/N	Check Questions	Y	N
	Background information of the facility		
1	Are there at least 8 health workers in your unit?		
2	Has there being any re-orientation of workers in this heath facility?		
3	Is there a town announcer attached to this heath facility?		
4	Are there job aids for health workers?		
	Availability of Vitamin A supplementation		
	Are there:		
5	Scissor to cut the capsule?		
6	Wipe or towel to clean oil off hands?		
7	Plastic bags or boxes to throw away used capsules?		
8	Are capsules stored away from direct sunlight?		
9	Are capsules supplies regularly in the last four years?		
10	Is government the only provider of this capsule within this facility?		
11	Is site organized for children to receive Vitamin A before vaccination?		

PRACTICE: Check by only observing the health worker administer the intervention without interrupting the procedure

12	Does the health worker screen for edema and MUAC before vitamin A administering?
13	Does the health worker give correct dose for age?
14	Does the health worker cut-open, administer and disposed capsule correctly?
15	Are hands clean and free of oil?
16	Does the health worker make sure the child is calm before he administer?
17	Does the health worker check to see the child swallow the drops and is alright?
18	Does the health worker record the dose on a tally sheet?
19	Does the health worker give parent message on vitamin A?
20	Does the health worker tell parents when to bring the child again for the next dose of vitamin A?

Remarks……

……

……

Research Assistant signature and

Date……..

Appendix V

Ethical Clearance

GOVERNMENT OF ABIA STATE OF NIGERIA

Ministry of Health

P.M.B. 7215, Umuahia, Abia State

Our Ref: AB/MH/E&HR/1/001/15

Your Ref:.....

Epidemiology & Health Research Unit

Department of Public Health/Disease Cont

Date: 15th January, 2015.

NOTICE OF FULL APPROVAL

Re: Factors Associated with Uptake of Vitamin A Supplements among Under-5 Children in Umuahia North LGA, Abia State

Dr OKEZUE, Godwin C.

Abia State Primary Health Care Development Agency

Ministry of Health

Umuahia, Abia State.

Application received: 13th January, 2015

This is to inform you that the research described in the submitted protocol has been reviewed and given full approval by the Health Research Ethics Committee domiciled in the Abia State Ministry of Health.

Please note that the National Code for Health Research Ethics requires you to comply with all institutional guidelines, rule and regulations connected with the conduct of your research. Also note that no changes are allowed in the research protocol without prior approval by the Ethics Committee.

Finally, the Committee reserves the right to conduct compliance visit to your research site without previous notification.

Dr O. Nwokocha

Chairman, Health Research Ethics Committee.