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REDUCING MALNUTRITION IN PREGNANCY THROUGH AWARENESS AND UTILIZATION OF MORINGA OLEIFERA – A NUTRITIONAL SUPPLEMENT IN AWKA SOUTH LOCAL GOVERNMENT AREA OF ANAMBRA STATE

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ABSTRACT

The poor state of health of mothers and their new born babies in Awka South Local Government Area of Anambra State due to malnutrition and micronutrient deficiency during pregnancy is at increase rate. Some of which are low foetus productivity, low birth weight, cretinism, brain damage, and above all are maternal morbidity and perinatal mortality. All these health problems could be resolved or reduced to the lowest minimum using a very cheap and affordable plant known as *Moringa oleifera* – a nutritional supplement. The study therefore ascertained the extent of awareness and utilization of different parts of *Moringa oleifera* as a nutritional supplement among pregnant women in the area. two research questions guided the conduct of this study and two hypotheses were tested at 0.05 level of significance. Pertinent and related literatures were reviewed. The study adopted descriptive survey research design. The population was 1,199 registered pregnant women from 30th October to 1st December 2014, who were attending antenatal clinic programme in Government Health Facilities (GHF) in the area of study during the period of this study. 269 pregnant women were sampled from six GHF out of thirteen GHF using simple random sampling techniques with balloting without replacement. The researcher was in better position to develop a well structured questionnaire titled ‘Questionnaire on awareness and utilization of different parts *Moringa oleifera* as a nutritional supplement’ which was used to elicit information from the respondents. Validation of the instrument was ensured through critical examination by three experts. A test retest reliability method was used to determine reliability ($r=.89$) of the instrument. Descriptive statistics of mean and standard was adopted in answering the research questions. Parametric inferential statistics of one-way ANOVA was used to test the hypothesis, and the findings among others were that the level of awareness of the existence of *Moringa oleifera* is high but level of awareness of its nutritional value and parts are low. There is low utilization of different parts of *Moringa oleifera*. Among the recommendations made were that pregnant women should be versatile in reading especially among the elites to uncover their doubts on the nutritional content of different parts of *Moringa oleifera*. Health educators are also advised to convey the knowledge gotten from this study in their nutritional counseling especially among the nutritional prone groups (example pregnant and lactating women).

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INTRODUCTION

Nutrition in pregnancy is an important issue that demands serious attention. When a developing foetus is malnourished in the early and later stages of pregnancy, it may also have a

lifelong programming effect which predisposes the baby to chronic health conditions later in life. It has a tremendous impact on every aspect of child development, and often, physical development receives the most attention (Holland, 2012). Nutrition is important throughout life but is critically essential in young children’s growth and development. Even mild under-nourishment can seriously affect a growing child. Children who have inadequate diets are also more susceptible to childhood illnesses because their bodies lack adequate

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immune system support and energy that a balanced diet provides. A Child's nutrition begins before birth; therefore the quality of a pregnant mother's diet has a direct influence on the baby's birth weight and brain size (Holland, 2012). According to Oladapo (2000), nutrients are substances that are supplied by food for the nourishment of the body; while nutrition is the process of nourishing or being nourished by the nutrients in food we eat. Living organisms assimilate nutrients in food and use it for growth and replacement of worn-out tissues. In most cases, individuals are not consuming or getting enough of these essential nutrients as required from their daily diets thereby need supplementation. Supplement means something that completes or enhances something else when added to it. Nutritional supplement also known as dietary supplement therefore is a preparation intended to supplement the diet and provide non-existent nutrients, such as vitamins, minerals, fiber, fatty acids, or amino acids in sufficient quantities in a person's diet (Oladapo, 2000). The possible absence of essential nutrients necessitates nutritional supplement. Under-nutrition therefore is condition that develops in an individual as a result of failure to obtain enough nutrients the body requires in order to stay healthy and functional (National Institute for Health and Clinical Excellence, 2009). Under-nutrition can be classified as either malnutrition or micronutrient deficiency.

Malnutrition occurs when an individual consistently consumes less of energy and life giving foods obtained from proteins, fats and carbohydrates than the individual expends (National Institute for Health and Clinical Excellence, 2009). Micronutrient deficiency on the other hand is a condition which occurs when an individual consumes enough food overall, but does not consume enough of the specific micronutrients the individual need to maintain growth and proper functioning of specific body parts and systems. When a woman is under-nourished prior to conception, she may be malnourished and underweight to the time she conceives. This will have an ongoing effect on her nutritional status throughout the pregnancy. Her nutritional status at the time she becomes pregnant is also an important factor influencing the health of the foetus as well as the long term health of the infant (Gardiner, Nelso, & Shellhaas, 2008). According to the Virtual Medical Centre (2010), Women who are under-nourished (have a Body Mass Index (BMI) of $< 18.5 \text{ kg/M}^2$) at the time of conception are unlikely to improve their nutritional status during pregnancy, when their bodies have additional demands due to the growing baby. They may fail to gain sufficient weight during pregnancy and have a higher risk of maternal mortality (dying whilst pregnant) than normal weight women.

World Health Organization (2010) reported that an under-nourished woman may lack the nutritional stores required to support embryo growth. Embryo refers to a fertilized egg, before it begins to take on human characteristics (at which stage it is referred to as a foetus). In the first few days after conception the embryo exists in the woman's womb but is not yet implanted into the lining of the womb where it will grow throughout the pregnancy. This is known as the pre-implantation period and is the period of pregnancy in which cells divide and replicate very rapidly. Maternal malnutrition can adversely affect the division and replication of cells in the

embryo at this stage, impairing its development. Impaired embryo development in turn adversely affects the development of the foetus in the later stages of pregnancy (Oladapo, 2000). A woman's nutritional status at the time she becomes pregnant also influences the differentiation of cells in the embryo into foetal and placental cells. When the embryo implants into the wall of a woman's uterus, it develops two types of cells, those that will become the foetus and those which will become the placenta (the structure which nourishes and supports the foetus during pregnancy). In undernourished women, a greater number of cells are likely to form the placenta compared to the foetus, meaning that the foetus begins its life smaller than it should be. This can lead to restricted foetal growth and increases the risk of the baby being born at a low-birth weight of ($< 2.5\text{kg}$). Low birth weight is in turn associated with a range of adverse outcomes in early childhood stages and later in life (Holland, 2012). Health risks for the mother and foetus or and newborn baby due to malnutrition during pregnancy can be summarized as follows: maternal morbidity, higher risk of poor pregnancy, anaemia, infection, lethargy and weakness, and lower productivity -for the mother (Holland, 2012). For the foetus and newborn baby, they are intrauterine growth retardation (IUGR) - under-growth and low birth weight. Low birth weights are, in turn, associated with a range of adverse outcomes for the developing foetus and/or new born baby. These include increased risk of stillbirth, premature birth; perinatal mortality (death of the infant within seven days of birth), infant neurological, intestinal, respiratory and circulatory disorders, birth defects; underdevelopment of some organs; cretinism (a congenital condition affecting the thyroid gland which results in lack of coordination, dull facial expression and dry skin) and brain damage. There are also numerous maternal and foetal health risks associated with micronutrient deficiency during pregnancy, that is, deficiency in particular micronutrients such as folate and vitamin B₁₂ (Holland, 2012).

According to Holland, maternal health risks which may arise as a result of deficiency in particular micronutrients include vitamin B₁₂ deficiency which is associated with anemia with its symptoms and neurological complications. Vitamin K deficiency is associated with blood clotting disorders, including increased clotting time which presents particular risks during delivery when women lose substantial amount of blood: Iron deficiency during pregnancy is associated with anemia. To the baby, maternal vitamin D deficiency is associated with foetal rickets (a condition which weakens the bones). Maternal iodine deficiency is associated with some complications in the infant such as congenital abnormalities, increased risk of infant mortality, mental deficiency and neurological cretinism (a congenital condition of poor thyroid hormone secretion which impairs cognitive development), psychomotor effect (affected movement). Maternal zinc deficiency is associated with foetal growth retardation and congenital abnormalities (Holland, 2012). However, as a component of prenatal care, micronutrient supplementation might reduce maternal morbidity and mortality directly by treating a pregnancy-related illness or indirectly by lowering the risk of complications at delivery (Oladapo, 2000). Nevertheless, the effectiveness of supplementation programs, notably of iron and folic acid tend to focus on infant well-being, perinatal mortality, preterm delivery and low birth

weight. According to Olagunju (2013), eating healthy, varied diet in pregnancy will help mothers to get most of the vitamins and minerals they need. There are some vitamins and minerals that are especially important. It is best to get vitamins and minerals from the food we eat, but during pregnancy, women will need to take some supplements as well to make sure they get everything they need. It is recommended that pregnant women should take 10 micrograms of vitamin D each day throughout the period of pregnancy. Vitamin D is needed to keep the bones and teeth healthy. Iron in pregnancy is also important and is contained in lean meat, dried fruit, nuts and green leafy vegetables (example *Moringa oleifera* leaves) contain iron. *Moringa oleifera* is a leafy plant that has the potential to improve nutrition, boost food security, foster rural development, and support sustainable land care (National Research Council, 2006). Fahey (2000) opined that the plant is extraordinary because all of its parts are edible and possesses nutritional and medicinal values. *Moringa oleifera* contains more than 92 nutrients and 46 types of antioxidants and almost has all the vitamins found in fruits and vegetables (Fuglie, 2001). It contains very strong concentration of vitamins A and C, B complex vitamins, iron, calcium, protein, zinc, selenium and, unusual for a plant source, all the essential amino acids (Fuglie, 2001).

As a source of nutrient, *Moringa* leaves probably rank as the best of all tropical vegetables. The leaves of the plant are outstanding as a source of Vitamin A and, when raw, vitamin C. They are a good source of B vitamins and among the best plant sources of minerals. The calcium content is very high, and Phosphorous is low, as it should be for a plant. The content of iron is very good. Thus, the leaves are one of the best plant foods that can be found (Ozumba, 2008). Presently, in Senegal and other parts of the tropics, *Moringa* leaves, leaf powder and pods are used in treating malnutrition and promoting physical and mental wellbeing, with visible effective results (Fuglie, as cited by Ozumba 2008). *Moringa* fruit powder, tea, and leaf capsules are other products of *Moringa oleifera* which are of interest in this study. Odeey (2012), posited that the nutritional superiority of fresh and dried *Moringa* leaves over other food materials such as carrots, orange, banana, spinach and yogurt cannot be over emphasized. In Nigeria for instance, these other food items are more expensive than *Moringa* leaves. Besides, they are mostly seasonal while *Moringa* leaves are available all the year round (Ozumba, 2008). Other parts of the plant that are edible which are discussed herein are seeds and flowers. Therefore, awareness of this wonderful plant is of utmost necessity.

The word awareness is derived from the word "aware". The encyclopedia explains the meaning of the word "aware" as follows: knowing something, having knowledge of something from having observed it or been told about it, noticing or realizing something knowing that something exists because you noticed it or realized that it is happening, knowledgeable, well-informed about what is going on in the world or about the latest developments in a sphere of activity (Bjorn, 2007). . In the content of this study, awareness is regarded or explained as knowledge about the latest development of nutritional values of a plant known as *Moringa oleifera*. Therefore awareness is necessary to enable individuals utilize the abundant opportunities and solution available to solve numerous health

problems facing human-beings (Willian & Einzia, 1995). Utilization on the other hand simply means the act of using. Its synonyms are application, discharge, employment, enjoyment, exertion, fulfillment, implementation, operation, performance, play, practice, pursuit, usage and use (Houghton Mifflin Company, 2009). According to the Houghton, Utilization is the act of utilizing or the state of being utilized. In the context of this study, Utilization simply means to put to use, especially to make profitable or effective use of something that is available. Awareness is necessary to enable individuals utilize the abundant opportunities and possible solutions available in solving numerous health problems facing human beings (Willian, 1995). One of these problems include, finding nutritional supplements for the pregnant women using *Moringa oleifera*. Pregnant women are female human beings carrying a developing embryo and fetus in their womb whose gestation period is nine months. Blount (2005) stated that pregnancy is one time in life when eating habits directly affect another person. From researchers experience, the poor state of our health in Nigeria generally of which Anambra State is one, results from poor food selection and cooking methods and our inability to incorporate enough delicious vegetables, whole grains and legumes, bean protein, and other wise food choices into our eating plan before and during pregnancy (Olagunju, 2013). These determine the basic nutritional health that our children are born with, and provide a model of their eating habits during childhood and beyond. Therefore, awareness and utilization of *Moringa oleifera* as a nutritional supplement among pregnant women is very vital. Nevertheless, the awareness and utilization of *Moringa oleifera* could be affected by numerous factors such as age, occupation and educational qualifications of the pregnant women in Awka South Local Government Area of Anambra state.

The people of Awka South Local Government Area have common cultural values and beliefs. In terms of religion, Christianity and traditional religion are the two main religions of the people. It has some cultural practices with poor socio-demographic characteristics (age and level of education of the child bearing women) which affect public health especially health of pregnant women and their children as regard to malnutrition and micronutrient deficiency. This constitutes the justification for carrying out the present study in this area. Based on the aforementioned, the researcher felt a springboard had been provided under which the present study is being carried out.

Statement of the Problem

Among numerous uses of *Moringa oleifera* plant, one of the most impressive is its use to fight malnutrition and famine in underdeveloped and underprivileged parts of the world. Presently in Senegal and other parts of the tropics, the awareness and feasibility of eradicating malnutrition among pregnant women and the general population was demonstrated using *Moringa oleifera* and was shown acceptable (Fuglie, 2001). According to Monera and Maponga (2012) in their research to determine the prevalence and patterns of use of *Moringa oleifera* among HIV positive patients as a nutritional supplement in Zimbabwe; it was concluded that *Moringa oleifera* supplementation can be used to increase the immunity among HIV positive people. Spread awareness about *Moringa*

is promptly becoming one of the most talked-about supplements in the market today especially in foreign countries. Meanwhile, the researcher observed in this country, Nigeria, that as a result of poverty, not all pregnant women can afford the different types of food they need to prevent the health risks of malnutrition and micronutrient deficiency for themselves and their foetus which include maternal morbidity, anaemia, lower foetus productivity, intrauterine growth retardation, low birth weight, stillbirth, premature birth, perinatal mortality, cretinism, brain damage, blood clotting disorders among others. All these health problems could be resolved or reduced to the lowest minimum if pregnant women become sufficiently aware of and utilize a very cheap and affordable plant known as *Moringa oleifera* – a nutritional supplement. Furthermore, the researcher is worried that the extent of awareness and utilization of this wonderful plant as done in other countries has not been known very well in this area, Awka South Local Government Area, by pregnant women as no study has been conducted in the direction. It is, therefore, imperative to conduct the present study as the findings will serve as a guide to objective remedial actions towards the risks of nutritional deficiencies for pregnant women and their babies.

Research Questions

1. To what extent of awareness of different parts of *Moringa oleifera* (leaves, seed, seed pods, and flowers) as an edible diet rich in essential amino acid do pregnant women have based on their educational qualifications?
2. To what extent do pregnant women utilize different parts of *Moringa oleifera* as nutritional supplement based on their educational qualification?

Hypotheses

1. There is no significant difference on the extent of awareness of the usefulness of the different parts of the plant (as an edible diet rich in essential amino acids) to the pregnant women of different educational qualification.
2. There is no significant difference on the extent of utilization of different parts of *Moringa oleifera* as a nutritional supplement by pregnant women based on their educational qualification.

METHODS

Research Design: This study adopted the descriptive survey research design. This research design is concerned with the collection of data for the purpose of describing and interpreting existing conditions, prevailing practices, beliefs, attitudes and on-going process.

Area of the Study: This study was carried out in Awka South Local Government Area of Anambra State. It is made up of nine communities and sixty eight villages with its headquarters located in Awka which is the capital of Anambra State. Geographically, the local government is situated on rolling flat land with a population of 321,570 (National Population, Anambra State 2006). The local government is bounded in the east by Orumba North, in the west by Njikoka Local Government Area, in the north by Enugu State and in the

south by Anaocha Local Government Area. Awka South Local Government Area houses the state government house, state ministries, boards, commissions, parastatals, industries, private and public schools, commercial establishments including higher institution of learning. Awka town also houses many of the Federal government establishment in the state.

Population of the Study: The population for this study was 1,199 pregnant women from 30th October to 1st December 2014, who were registered and attending antenatal clinic in government health facilities (GHFs) in Awka South Local Government Area of Anambra State during the period of this study. Data and population size was obtained from the Antenatal Care Register, 2014. Specifically, there are thirteen GHFs in Awka South Local Government Area of Anambra State (Anambra State National Programme on Immunization, 2014). The choice of these GHF was based on the fact that every government hospital and primary health centre organizes antenatal clinic class where health talks and other issues as regards to pregnancy are discussed.

Sample and Sampling Technique: The study sampled 269 registered pregnant women and who were attending antenatal clinics as at the time of the study (30th October to 1st December, 2014) in selected GHFs. Two stages of sampling techniques were involved; firstly, Six GHFs were drawn from thirteen GHFs in Awka South Local Government Area of Anambra state using simple random sampling techniques with balloting without replacement. The application of this technique was to ensure that each population is given equal chance of representation. Secondly, fifty percent of registered respondents from the population of each of the six selected GHF were used purposively.

Instrument for Data Collection: Structured questionnaire was used for data collection. The researcher developed a well structured questionnaire titled ‘Questionnaire on awareness and utilization of different parts of *Moringa oleifera* as a nutritional supplement’ which was used to elicit information from the respondents. The questionnaire was divided into three sections; A, B, and C. Section ‘A’ contained three items aimed at eliciting information on personal data of the respondent and section ‘B’ contained items on awareness of different parts of *Moringa oleifera* and its nutritional value by pregnant women. Its respond options are; not at all aware, slightly aware, somewhat aware, moderately aware and extremely aware. Section ‘C’ contained items on the utilization of different parts of *Moringa oleifera* as a nutritional supplement by the respondents with respond options as; never use, almost never, sometimes, almost every time and frequently use. The questions were responded by ticking (✓) in the box against option that applied to the respondents.

Validation of the Instrument: The instrument for data collection was validated by three experts in the fields of Health Education, Measurement and Evaluation and Human Kinetics in Nnamdi Azikiwe University, Awka. The experts vetted the instrument to ensure its appropriateness in relation to language, clarity, adequacy of content and ability to elicit accurate information in relation to the purpose of the study, research questions and hypotheses.

Reliability of the Instrument: Reliability test for the instrument was carried out to determine the internal consistency of the instrument. Test-retest method was used to achieve this. Twenty copies of the questionnaires were distributed to pregnant women at Nnamdi Azikiwe Teaching Hospital, Nnewi, which were not part of the target population with assistance of briefed nursing sisters that work at their antenatal clinic (research assistants). After two weeks, the same but fresh (unfilled instrument) was re-administered to the subjects on face-to-face basis. The two results were analyzed using Pearson Product Moment Correlation Co-efficient test instrument which yielded a correlation of 0.89.

Method of Data Collection: Two hundred and sixty-nine copies of the instrument were administered to the respondents personally by the researcher with the assistance of the briefed nursing sisters (research assistants) serving at the antenatal clinics. The administration of the questionnaire was done as they came for antenatal clinic on their antenatal clinic days until the sampled number of copies for each of the selected GHF was distributed. The retrieval of the questionnaires was on-the-spot retrieval, therefore the total number shared were received.

Method of Data Analysis

The collected data analysis was carried out using SPSS (Statistical Package for Social Sciences) version 22. Descriptive statistics of mean was adopted in analyzing the data collected in respect of the research questions. Items with mean responses of 3.0 (the criterion mean score of the items in the questionnaire) and above were considered as extremely aware, or as frequently use of different parts of *Moringa oleifera* as a nutritional supplement, while those with mean responses of 2.5 were regarded as moderately aware or use almost every time, those with mean responses of 2 were regarded as somewhat aware or sometimes use, 1.5 were slightly aware or almost never use and 1 were not at all aware or never use different parts of *Moringa oleifera* as a nutritional supplement by the respondents. Parametric inferential statistics of one-way ANOVA was used to test the number of hypothesis at 0.05 level of significance.

PRESENTATION AND ANALYSIS OF DATA

Research Question 1

To what extent of awareness of different parts of *Moringa oleifera* (leaves, seed, seed pods, and flowers) as an edible diet rich in essential amino acid do pregnant women have based on their educational qualifications? Data answering this research question are contained in Table 1. The result in Table 1 shows that the highest mean score is that of the Degree /HND holder with 3.12, followed by the NCE/OND holders with mean of 2.74. This shows that the Degree/HND holders and NCE/OND holders have above moderate awareness of different parts of *Moringa oleifera* as an edible plant rich in essential amino acid. Table 3 further revealed that the O'level, postgraduate and below O'level holders are slightly aware of the different parts of the plant as an edible plant rich in essential amino acid. Their mean responses are respectively 2.40, 1.86 and 1.80 respectively.

Table 1. Respondents' Mean Responses on the Extent of their Awareness on Different Parts of the Plant as an Edible Plant Rich in Essential Amino Acid in Relation to their Different Educational Qualifications

Qualifications	N	Mean	Decision
Below O'level holder	15	1.80	Slightly aware
O'level holder	29	2.24	Somewhat aware
NCE/OND	67	2.74	Moderately aware
Degree holder/HND	126	3.12	Extremely aware
Postgraduate	32	1.86	Slightly aware
Total	269	2.71	Moderately aware

Research Question 2

To what extent do pregnant women utilize different parts of *Moringa oleifera* as nutritional supplement in relation to their educational qualifications? Data answering this research question are contained in Table 2.

Table 2. Respondents' Mean Responses on the Extent of their Utilization of Different Parts of *Moringa oleifera* as Nutritional Supplement in Relation to their Educational Qualifications

Qualification	N	Mean	Decision
Below O'level	15	2.27	Sometimes use
O'level	29	1.90	Almost never
NCE/OND	67	2.15	Sometimes use
Degree/HND	126	2.08	Sometimes use
Postgraduate	32	1.41	Never use
Total	269	2.01	Sometimes use

The result in Table 2 revealed that the mean response of the respondents with educational qualification below O'level is 2.27, followed by NCE/OND, Degree/HND, O'level and Postgraduate certificate holders with 2.15, 2.08, 1.90 and 1.41 respectively. They all showed low utilization of different parts of *Moringa oleifera* as nutritional supplement which are below 3.00.

Hypothesis 1

There is no significant difference in the extent of awareness of the usefulness of the different parts of the plant (as an edible diet rich in essential amino acid) by pregnant women of different educational qualifications. Data testing this hypothesis are contained in Table 3. The result in Table 3 indicated that the educational qualification of pregnant women did have significant influence on their awareness over different parts of the *Moringa oleifera* of as an edible diet rich in essential amino acid since the F value of 27.26 is greater than the p-value of 0.00 (F-cal. = 27.26, P = 0.000 < 0.05). The null hypothesis is rejected. This implies that the extent of awareness of the nutritional value of *Moringa* is differed accordingly to mothers of educational qualification.

Hypothesis 2

There is no significant difference in the extent of utilization of different parts of *Moringa oleifera* as a nutritional supplement by pregnant women based on their educational qualifications. Data testing this hypothesis are contained in Table 4. The result in Table 4 indicated that there is significant difference in the level of utilization of the different parts of *Moringa*

oleifera as a nutritional supplement among pregnant women in Awka–South Local Government Area based on their educational qualification since the F value of 4.85 is greater than the p-value of 0.00 (F-cal. =4.852, P = 0.001). The null hypothesis is thus rejected. This implies that the extent of utilization of different parts of *Moringa oleifera* as a nutritional supplement among pregnant women in Awka–South Local Government Area differed accordingly based on their different educational qualifications.

Table 3. ANOVA Summary on Pregnant Women’s Awareness Over Different Parts of the Plant as an Edible Diet Rich in Essential Amino Acid Based on their Educational Qualifications

Variation	Sum of Squares	Df	Mean Square	F	P-value
Between Groups	63.279	4	15.820	27.26	.000
Within Groups	153.181	264	.580		
Total	216.460	268			

Table 4. ANOVA Summary on Pregnant Women’s Utilization of Different Parts of *Moringa oleifera* as a Nutritional Supplement Among Pregnant Women based on their Educational Qualifications

Variations	Sum of Squares	Df	Mean Square	F	P-value
Between Groups	14.836	4	3.709	4.852	.001
Within Groups	201.793	264	.764		
Total	216.629	268			

RESULTS AND DISCUSSION

The Degree holder/HND and NCE/OND holders are extremely aware that the plant is an edible diet rich in essential amino acids. Table 1 further revealed that the O’level, postgraduate and below O’level holders are slightly aware of the different parts of the plant as an edible diet rich in essential amino acids. Their mean responses are respectively 2.24, 1.86 and 1.80 which are below 3.00. Surprisingly, the low awareness found among the postgraduate degree holders calls for a re-thinking among our post graduates degree holders who are supposed to be the custodians of education/information. Pregnant women below O’level showed that they sometimes utilize *Moringa oleifera* as a nutritional supplement with mean response of 2.27, Other qualifications; NCE/OND (2.15), Degree/HND (2.08), O’level (1.90), Postgraduate (1.41) showed almost never utilize different parts of *Moringa oleifera* as a nutritional supplement.

The implication still remains that these are the people close at the market places were sensitization of *Moringa oleifera* is done. In table 3 the result indicated that the educational qualifications of pregnant women did have significant influence on their awareness over different parts of *Moringa oleifera* as an edible diet rich in essential amino acids with p-value = 0.00. The null hypothesis is thus rejected. Then, it could be concluded that there is significant difference in the extent of awareness over different parts of the plant as an edible diet rich in essential amino acids to the pregnant women of different educational qualifications.

Pregnant women below O’level showed that they sometimes utilize different parts of *Moringa oleifera* as a nutritional supplement with mean response of 2.27, Other qualifications; NCE/OND (2.15), Degree/HND (2.08), O’level (1.90), Postgraduate (1.41) showed almost never utilize different parts

of *Moringa oleifera* as a nutritional supplement. The implication still remains that these are the people close at the market places were sensitization of *Moringa oleifera* is done.

Conclusions

Based on the research findings and discussion of the results of this study, it is hereby concluded that:

1. The Degree holder/HND and NCE/OND holders have high awareness that the plant is an edible diet rich in essential amino acids unlike Postgraduates.
2. Pregnant women below O’level showed the high utilization of different parts of *Moringa oleifera* unlike other educational qualifications.

Implications of the study

The findings of the study revealed that there is fully awareness of the existence of *Moringa oleifera* but its nutritional contents and parts are not well known among the pregnant women in Awka –South Local Government Area of Anambra State. That is why its utilization is not as high as it supposed to be. This implies that the health of the pregnant women can be improved if they should be encouraged by the ministry of health in conjunction with the health Educators, through workshops and seminars to start making use of *Moringa oleifera* parts in their daily diets.

Recommendations

On the basis of the findings and conclusion, therefore the researcher recommends as follows:

- The Federal ministry of health should organize health intervention programmes through seminars and workshops that will boost the sensitization of *Moringa oleifera* at strategic places such as market places, churches and village halls.
- Pregnant women that were not aware of the existence of *Moringa oleifera* are advised to be versatile in reading especially among the elites to uncover their doubts about the nutritional content of the plant. This will improve their

nutrition and then reduce the implication of malnutrition and micronutrient deficiencies.

- Both pregnant women and other people should enter *Moringa* Development Association of Nigeria (MDAN) with the headquarters at Abuja and branches in all the states and Local government areas of the Federation to boost their knowledge about the plant in question.
- Health educators and community health workers should always work with the nurses and nutritionist to educate pregnant women on the nutritional importance of *Moringa*.

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