

## Impact of Micronutrient Food Factor: A Strategy to Hiv/Aids Intervention in Rural Areas of Southeast Nigeria

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**Abstract:** The study identified the impact of micronutrient food factor: a strategy for HIV/AIDS intervention in rural area of southeast Nigeria. The study adopted a survey research design. The population comprised of health personnel and nurses. Multistage sampling Technique was used in determining the sample population of three hundred and sixty five nurses and health personnel in Southeast Nigeria. Forty one items Questionnaire was used for data collection. Data collected were analyzed using frequency, and mean. The findings include: 1. micronutrient food factor has impact as a strategy for HIV/AIDS intervention. 2. Micronutrient food factor is a strategy to HIV/AIDS intervention. Recommendations were made based on the research findings.

**Keywords:** impact, micronutrient, food factor, strategy, HIV/AIDS intervention

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Date of Submission: 16-06-2018

Date of acceptance: 02-07-2018

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### I. Introduction

#### (Background of the Study)

Micronutrient is a mineral, vitamin or other substances that is essential, even in very small quantities, for growth or metabolism. Micronutrient is a chemical element or substances required in trace amounts for normal growth and development of living organisms. Micronutrient, according to Wikipedia, the free encyclopedia is essential elements required by organisms in small quantities throughout life to achieve a desired range of physiological functions to maintain health. Micronutrients are vitamins and mineral nutrients that cannot be produced by the body but are got from food sources or drugs (Onuorah 2009). According to WHO (2017), *micronutrients* are needed only in minuscule amounts, these substances enable the body to produce enzymes ( proteins that control the speed of chemical reactions in the body), hormones (special chemical messengers in the body that are created in the endocrine glands) and other substances (vitamins, minerals, fatty acids and amino acids ) essential for proper growth and development.

According to Editors Encyclopedia Britannica (2018), Enzymes, are substances (chemical elements or compounds) that increases the rate of a reaction without itself being consumed in the living organisms, regulating the rate at which chemical reactions proceed without it being altered in the process. Chemical reaction therefore is a process in which one or more substances, (the reactants) are converted to one or more different substances to form a product (Kotz&Treiche, 2018). Kotz and Ttieche further stated that chemical reaction rearranges the constituent atoms (invisible or unit part) of the reactants to create different substances as products. Without enzymes, these reactions in the cell would be too slow to keep organism alive. Enzymes speed up chemical reactions in the human body; binding into molecules and altering them in specific ways. Enzyme makes all chemical reactions in the cell possible. It is a biological molecule (typically proteins inside cells) that significantly speeds up the rate of virtually all of the chemical reactions that take place within the cells (cells are little bundles of chemical reaction that reproduce and create energy, break and build up molecules). Enzymes are formed by special chains of amino acids in different shapes to do special jobs, (e.g. breaking down sugar and fat molecules or to make more enzymes). The cells need the enzymes to live; each enzyme has different work to do. When the body is missing a type of enzyme, the cells can't work properly thereby leading to problems. Enzymes are essential for respiration, digesting food, muscle and nerve function, among others. (Nweman 2018). According to Muffymarracco (2014) there are six important enzymes; *oxidoreductases*, *transferases*, *hydrolases*, *lyases*, *isomerases*, and *ligases*. According to Muffymarracco (2014) these enzymes perform the following function to the body:

- Oxidoreductases catalyze oxidation or reduction reactions (i.e. transfer of electrons from one molecule (the reductant) to another (the oxidant) for essential metabolic processes.
- Transferase enzymes catalyze the transfer of a functional group (such as methyl) from one molecule to another (donor and receptor molecule for most basic and vital process in life).
- The hydrolases bring about hydrolysis (breaking of chemical bonds with water. Example Exohydrolase enzymes cut the molecules at the end of the chain, and endohydrolase enzymes do so in the middle of the chain.
- Lysis (lyases) reactions generate a double bond and are brought about by lyase enzymes. Lysis reactions are the kind of elimination reactions that are not hydrolytic or oxidative. The lyases are also sometimes called synthase enzymes. It has a reverse reaction; two substrates are required for the reverse reaction to happen, whereas one substrate is required for the lysis reaction. This makes lyases unique among enzymes.
- Isomerase enzymes catalyze structural changes within a molecule to bring about a change in shape since there is only one substrate and one product with nothing gained or lost with geometric, structural, enantiomer, and stereoisomer isomerases.
- Ligation (ligases) is brought about by ligase enzymes. Ligation occurs when two substrates are joined together. Chemical potential energy is usually required for this reaction to occur, so it is often paired with the hydrolysis of a diphosphate bond. DNA (Deoxyribonucleic acid) ligase which catalyzes the ligation or repair of breaks in DNA; is an example of a vital enzyme in this category. These happen regularly in the body and it takes four hours to break down without extreme pH or high temperature. That is why micronutrient food factor has impact to individual healthy living especially HIV/AIDS individuals.

Micronutrient enables the body with hormones. Hormone is any substance produced by one tissue and conveyed by the blood stream to another to effect physiological activity. However to achieve optimal health and hormone balance, depended on nutrient status which is achieved through feeding the body with right micronutrient (Bepure 2017). Micronutrients therefore are the essential vitamins, minerals, and fatty acids food factor. According to (Bepure 2017), "Every time our body creates a hormone or detoxifies a toxin in the liver, mineral or vitamin is required to make this happen. Micronutrient are rich in vegetables, fruits, eggs, milk,

green leafy vegetables, fermented foods, germinated foods ( Pedia 2016). Therefore the impact of micronutrient food factor: a strategy to HIV/AIDS intervention in rural areas of Southeast Nigeria identifies the important of this micronutrient food factor as a strategy for HIV/AIDS intervention.

The researchers observe micronutrient as a food factor that highly intervene and improves health of individuals especially the HIV/AIDS. Food factor are the choices of micronutrient food sources by individuals especially the HIV/AIDS. HIV/AIDS emancipated from HIV; a tiny germ that gets past the skin and mucous membrane to cause diseases. It is retrovirus belonging to the family of viruses. According to Ike (2003) the virus causes AIDS and has a capacity to reactivate with our body's antibodies, kill the natural killer cells, and depress our immunity from eliciting antibody formation of virus specificity. It is AIDS because the body couldn't fight the diseases from increasing to AIDS. HIV/AIDS according to Onuorah (2009) is transmitted from infected blood, semen or vaginal fluids when in contact with broken skin or mucus membranes. It is infected by attaching itself to a selected cell with special receptor (e.g. CD4 antigen). The receptor is found in the body's immune system, the helper T lymphocytes (a type of white blood cell, which has a very crucial role in the immune system), epithelium bowel and microglia cells in the brain are also cells that support HIV growth. The virus (HIV) is like an envelope surrounded by a fat containing (lipid) or coat with RNA (Ribonucleic acid) on its core. HIV reproduces itself by shedding the lipid coat and injects its RNA into the human cell attaching to the CD4 antigen carrying cell. The RNA (Ribonucleic Acid) replicates into the human cell DNA (Deoxyribonucleic acid) Jeffries 1988), creating a poor condition of health to individuals that have contact.

Despite the antiretroviral therapy (ART) and micronutrient drug supplements for survival, challenges progresses especially with those in the rural areas. This was observed by the researchers that in spite of great access to micronutrient food factor for those in rural areas HIV/AIDS stress progresses the main because they lack interest and avoids micronutrient diet factor (e.g. vegetables, fruits among others) because of ignorance. Few of them who have knowledge never practice micronutrient food factor as a remedy to their health problem, some of them lack the facilities. Few of them that are introduced to HAART suffer the oxidative stress because they do not believe in the micronutrient supplement or the micronutrient food factor to be free. In view of these the researchers were touched and deemed it very important to study on the "impact of micronutrient food factor: a strategy for HIV/AIDS intervention in rural areas of southeast Nigeria.

Strategy is a plan, design or tactics to release the stress of HIV virus. Micronutrient food factor (vitamins and minerals) is a strong strategy; a food factor which are necessary for vital functions (Bailey, West, Black(2015) and Samaras, Lang, Genton, Frangos, Pichard(2013)). Jackson (1999) identified that micronutrients consist only of 0.01 % of body mass and though the amounts required are very low, a lack of micronutrient can lead to severe, non-ignorable health disorders. Sasmaraetal (2013) stated that it is a threatening to life when low. HIV/AIDS individuals have low serum levels of many specific micronutrients. For example, it was

examined that decreasing vitamin E, increases cells and special cells (CD4) diseases, the same with decrease with vitamin B12 that leads to diseases progression. There is a low serum selenium level, associated with increased risk of mortality in HIV infected injection drug users. This is because of decrease in micronutrient food factor that results to low micronutrient abnormalities. Some supplements most times interact with prescribed medications and at times are not good to the body system than food factor supplement that is cool, comfortable and provides the body with a high micronutrient level, with no chemical reaction or reduction of nutrient. This is why HIV/AIDS whose bodies are fragile and prone to infections should resort to high micronutrient food factor.

Micronutrient a trace elements, (a collective term used for essential vitamins and minerals); is an essential impact to healthy body. Example Vitamin consists of water soluble and fat soluble vitamins; fat soluble vitamins are: vitamin A (Retinol), vitamin D (Cholecalciferol), vitamin E (Tocopherols). Vitamin K (phyloquinone) they are together called ADEK. They are fat soluble because they dissolve in oil. While Water soluble vitamins dissolve in water and are the B-complex vitamin; include B1 (thiamin), B2 (Riboflavin), B3 (Niacin), B5 (Pantothenic acid), B6 (Pyridoxine), C (Ascorbic acid), B7 (Biotin), B9 (Folic acid), B12 (Cyanocobalamin). While minerals include: iron, copper, zinc, manganese, iodine, fluorine, Cobalt, selenium and Chromium. These comprised the food factors that are needed to be taken from our diet. Diets should be rich with a good quantity and quality of the above nutrient. According to Graic (2008) diet poor in fruits, vegetables, grains, nut tends to be deficient in antioxidant vitamins (A, C and E) and increases the development of diseases.

Therefore food or diet with low micronutrient food factor improves diseases development especially with HIV/AIDS individuals. Micronutrient food sources progresses better than the supplement and controls the oxidative stress of the HAART (Highly Active Antiretroviral Therapy). The study therefore, will be too significant to every HIV/AIDS individuals especially those in the rural areas of Southeast Nigeria; to stop the oxidative stress of the Anti Retroviral Drugs (ATR). Micronutrient food sources are needed to be taken in good quantity when the CD4 count is above 300 levels to suppress the virus, at this stage it is regarded as stage one. But when the CD4 count is below 300 levels, HAART (highly active antiretroviral therapy) is needed to be administered with high micronutrient food intake because the immunity of the body is low and has contacted the disease or has affected by the HIV virus which was regarded as stage two (Obi in Onuorah 2009). Obi further stated that when this therapy breaks at interval and started again, the therapy cannot be functional again that is why the HAART are needed to be introduced most of the time with micronutrient food intake.

Tang, Alice, Jancaetal (2005) also illustrate that many infected patients are still taking vitamin supplement, some at very high doses in conjunction with HAART, indicating that HAART needed micronutrient food factor supplement to suppress the oxidative stress. It was observed, that populations of HIV infected patients treated with HAART, undergoes oxidative stress from the HAART and that of the HIV replication. This is because the HAART does not control the oxidative stress level; therefore micronutrient food factor is very important to play a vital role reducing the oxidative stress of HIV/AIDS individuals as well as improve their disease health for a good living condition (Okoye in Onuorah 2009). Most times oxidative stress occurs due to malnutrition as a result of abnormal micronutrient in the body. Malnutrition due to insufficient intake of micronutrient food factor especially among HIV/AIDS, can lead to the destruction of DNA (Deoxyneucleic acid) in them since it is the micronutrient that protects the DNA. Example DR. Bruce Ames published a paper stating that a deficiency of folic acid, vitamins C, E, B6, B12, Niacin causes strained break of DNA, oxidative lesions and increases susceptibility to cancer.

Today we encounter diseases especially HIV/AIDS ill health as a result of not having a quality diet (i.e. not taking micronutrient as required). According to Graic (2008) a good diet must be rich with anti oxidant (micronutrient) and it is important for enhancing HIV/AIDS health or disease conditions (Onuorah 2008). Icheoku (2008) confirms that the treatment of HIV/AIDS will be most effective when a good diet is adopted. According to Pamplona (2008) micronutrients have healing powers, if taken in good quantity, does and controls infectious diseases and diseases from the; eye, nervous system, heart, arteries, blood, respiratory system, liver and gall bladder, stomach, intestine, Urinary tract, reproductive system, metabolism, Skeletal system, skin promotion among others. Graic (2008) emphasized that a diet rich in vitamin (antioxidants e.g. vitamin C and E and the carotenoids) improves health, prevents risk of coronary heart disease and cancer. He said, fruits and vegetables, whole grains, nuts and seeds, legumes and various herbs (such as garlic, onions, rosemary, basil, cilantro, oregano, thyme, cumin, dill, turmeric and tarragon are rich with variety of phytochemicals ( chemical compounds produced by plants (micronutrient) that are important for promoting health and prevents diseases. This is because the phyto chemicals may act as anti oxidants, stimulating the immune system, induce protective enzyme in the liver or block damage to genetic material. Again citrus fruits, vegetables of cabbage family, carrot family, yellow orange, coloured fruits and vegetables are good phyto chemicals that protect us against disease, Soya beans are good for its geni-stein and lower cholesterol levels and inhibit prostate and breasts cancer, fruits and vegetables are rich in potassium and aids in lowering blood pressure levels and risks of strokes. Therefore micronutrient has great impact for healthy body especially the HIV/AIDS.

### **Purpose of the Study**

The main purpose of this study was to study the, “impact of micronutrient food factor: a strategy for HIV/AIDS intervention in southeast Nigeria” Specifically the study intended to:

1. identify the impact of micronutrient food factor for HIV/AIDS intervention
2. identify micronutrient food factors; a strategy to HIV/AIDS intervention

### **Research question:**

This study sort answers to the following research questions:

1. What are the impacts of micronutrient food factor for HIV/AIDS intervention?
2. What are the micronutrient food factors (sources); as a strategy to HIV/AIDS intervention?

## **II. Methodology**

### **Design of the study:**

The study utilized a survey design to collect relevant information for the study;”impact of Micronutrient food factor: as a strategy to HIV/AIDS intervention in rural areas of Southeast Nigeria.

### **Area of the Study**

The study was carried out in Southeast Nigeria. Southeast Nigeria has five states with their different capitals and local government areas that accommodate all tribes and communities. These states have many hospitals and other health establishments with nurses and health personnel.

### **Population for the study/ Sample for the study:**

The target population for the study comprised of health personnel and nurses. The population of each of the state was collected from the different state capital. Their population determined using multi stage sampling technique. Where the capital of all the five states was sampled as well as the health personnel and nurses was sampled. This technique according to Eboh (2009) involves a procedure whereby the selection of units into the sample is organized in stages. Stage one used stratified random sampling to select the states and their capitals comprising Abia, Anambra, Ebonyi, Enugu and Imo state. Stage two; used Purposive sampling to select all general hospitals in these states. Stage three; purposive sampling was used to select range of health personnel and nurses. Stage three random sampling was used to select two hundred health personnel and two hundred nurses in each selected state and capitals of southeast Nigeria. Therefore the total sample size for the study was four hundred (400), comprising of two hundred nurses and two hundred health personnel. They include:

<b>State</b>	<b>Capital Cities</b>	<b>No. of Health personnel</b>	<b>No. of Nurses</b>
Abia	Umuahia	40	40
Anambra	Anambra	40	40
Ebonyi	Abakaliki	40	40
Enugu	Enugu	40	40
Imo	Owerri	40	40
<b>Total</b>		200	200

Therefore the total sample size used for the study was 400.

### **Instrument for data collection:**

The instrument used for data collection was structured questionnaire. The questionnaire items were produced based on the information collected from related literature. The questionnaire was made up of forty one (41) items coded base on a (4), point rating scale of Strongly Agreed (SA) = 4, Agreed (A) = 3, Disagree (D) = 2, Strongly Disagree (SD) = 1 respectively. Research question was administered to all the sampled respondents (health officers and nurses) in the selected capitalstates and towns. The instrument was subjected to face validation by producing draft copies of the questionnaire. This was given to three experts in the field of science education in Anambra state who critically examine the items included with the specific purpose of the study and made useful suggestions that improved the quality of the instrument. Their recommendations, advice, suggestion and observations were used to review the questionnaire items. To determine the reliability of the instrument, the questionnaire item was administered to five health personnel and 5 nurses in another different zone band state Rivers state in Nigeria. This was to ensure that the respondents used in the reliability testing were excluded from the study sample. Their responses was subjected to reliability test using Cronbach alpha coefficient which result was 0.75 and was considered reliable for it to be used in collecting data for the study.

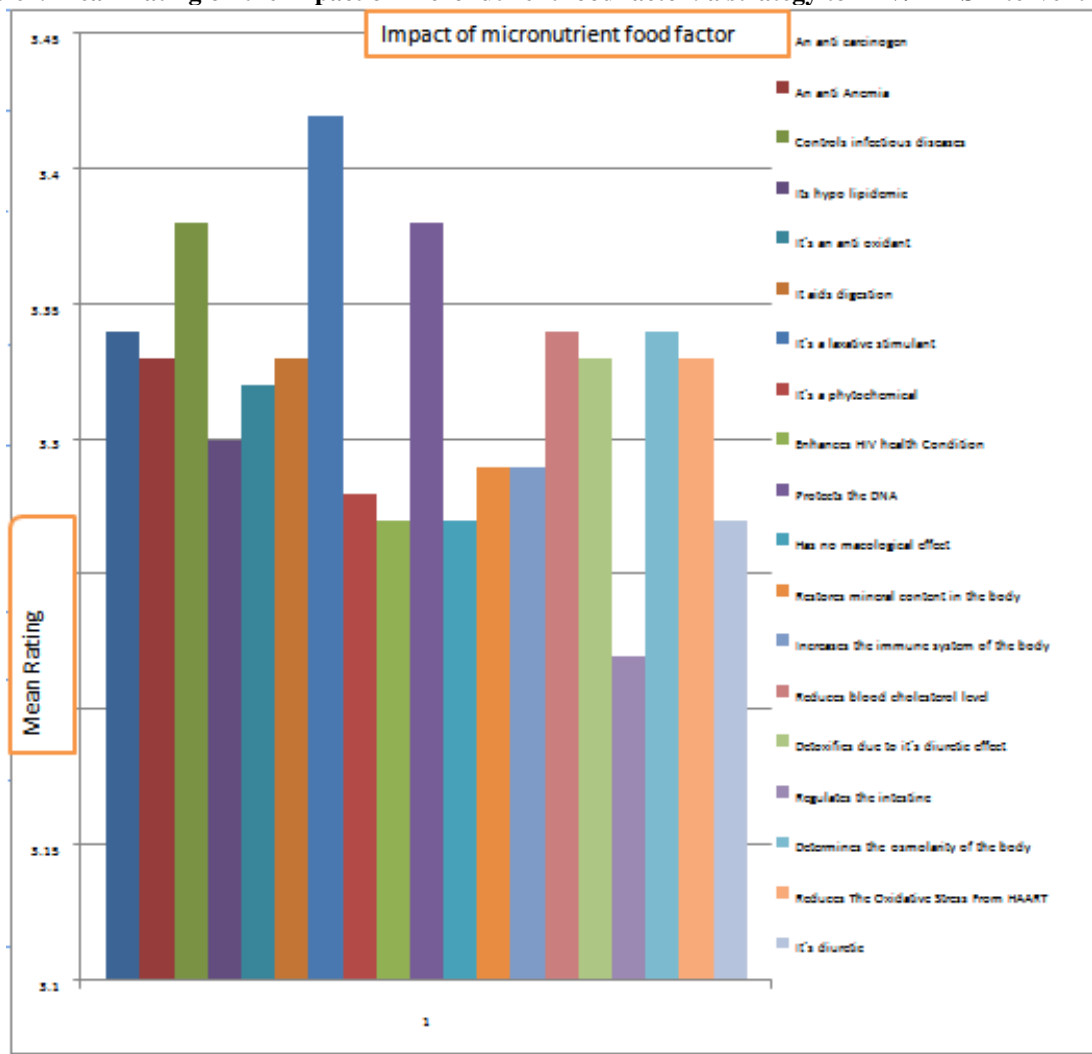
**Method of Data analysis:**

Four hundred (400) questionnaires were administered by hand to the respondents by the researchers with the help of research assistants in each state capital. However, three hundred and sixty five (365) were returned. Frequency counts and mean were used to analyze the data collected. The decision was any item with a mean score of 2.50 and above was regarded as agreed. Similarly, any item scored below 2.50 was regarded as disagreed.

**III. Result /Findings**

These are as follows:

**Table1. Mean Rating on the impact of micronutrient food factor: a strategy to HIV/AIDS intervention**



The table one result above shows that all respondents agree to all the items as the impact of micronutrient food factor for HIV/AIDS intervention.

**Table. 2.** Mean rating on the Micronutrient food factor: a strategy for HIV/AIDS intervention

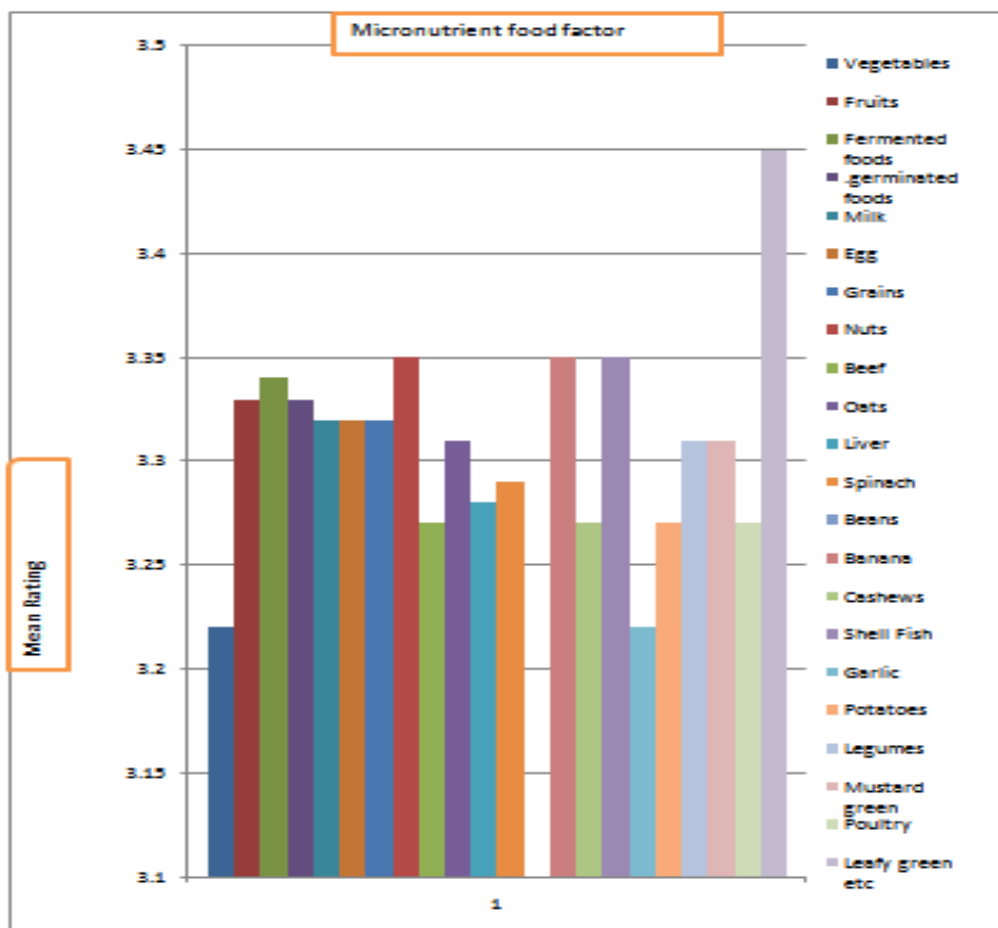


Table two above revealed that the items were accepted as micronutrient food factor; a strategy for HIV/AIDS intervention. Since all the responses were within the range of 2.50 and above was agreed.

#### IV. Conclusion

The findings of this study, Impact of micronutrient food factor: as a strategy for HIV/AIDS intervention in rural areas of southeast Nigeria showed that most HIV/AIDS have poor knowledge of micronutrient food intake for their disease condition which is the major area needed to be intervened to be able to reduce the HIV virus challenges for survival. The result also proves that micronutrient food intake has impact on HIV/AIDS intervention, which was where the researchers studied extensively. This needs to put into practice in order to improve HIV/AIDS challenges. Impact of micronutrient food intake is a knowledge, attitude and practice needed to improve for disease condition of HIV/AIDS to enable intervention of the diseases infection especially in the rural areas of Southeast Nigeria. Therefore HIV/AIDS especially rural areas in Southeast Nigeria should study pick direction to correct their wrong attitudes and other ill practices of micronutrient food factor to prevent poor health condition. Theses will create happy and comfortable condition as well as well being of the country. It will also increase healthy living condition necessary to increase growth and reduce poverty for better growth of individuals and the nation

#### V. Recommendations

From the findings of this study, the following recommendations were made. The government of Southeast Nigeria should:

- Provide educational knowledge like this study from time to time to improve the HIV/AIDS disease condition.
- Support should be given to HIV/AIDS in rural areas to increase micronutrient food intake.

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Unoma C. Onyeazor .”Impact of Micronutrient Food Factor: A Strategy to Hiv/Aids Intervention in Rural Areas of Southeast Nigeria." *IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)* 11.6 (2018): 41-47.