# KNOWLEDGE OF HEALTH BENEFITS, ATTITUDE AND CONSUMPTION OF FRUITS AND VEGETABLES AMONG UNDERGRADUATE TEACHER TRAINEES IN SOUTHWESTERN NIGERIA

***Iyanda, A. B & Moronkola, O. A***
*Dept. of Health Education, Faculty of Education, University of Ibadan, Ibadan.*

## Abstract
*Healthy nutrition behaviour, especially fruits and vegetables consumption has been regarded as crucial factor in preventing some diseases. Fruits and vegetables are an important component of a healthy diet and, if consumed daily in sufficient amounts, could help prevent major diseases and certain cancer. Several studies have been done on pre-service teachers but little research attention has been directed towards consumption of fruits and vegetables, therefore, this study focused on knowledge of health benefits, attitude and consumption of fruits and vegetables among pre-service teachers in Southwestern, Nigeria. three hundred (300) respondents were randomly selected. KHBFVC (r=0.78), ATFVC (r=0.81) and FVC (r= 0.77) scales were used as instrument for data collection. Data were analysed using descriptive statistics, Chi-square and Pearson Product Moment Correlationt at 0.05 level of significance.*
*Respondents mean age was 21.81 ±2.30 years. There was no significant knowledge of health benefits ($X^2$cal= 33.01, $X^2$crit= 40.123, df= 27), attitude ($X^2$cal= 41.37, $X^2$crit= 43.773, df= 30) and consumption ($X^2$cal= 23.96, $X^2$crit= 32.671, df= 21) of fruits and vegetable among pre-service teachers. There was significant relationship between knowledge of health benefits and attitude (r=.726), knowledge and consumption (r=.501) attitude and consumption (r=.627).*
*It was concluded that there was no significant knowledge of health benefits of consumption of fruits and vegetables among pre-service teachers in southwestern, Nigeria. Pre-service teachers should be educated on health benefits of fruits and vegetable consumption which may lead to reduction in mortality and morbidity as associated with inadequate consumption of fruits and vegetables. Hence, the need for nutrition education that will include fruits and vegetable consumption as part of general education studies (GES) in Universities in Southwestern Nigeria.*

**Key words:** *Knowledge, Attitude, Consumption, Fruits and vegetables, Pregnant women*

## Introduction
There are many recent technological breakthroughs (telemedicine, organ donation and transplantation) in health care that are designed to improve health status of people, but human behaviour remains one of the largest sources of variance in health-related outcomes. People's health and well-being are largely affected by

lifestyle factors such as smoking, hygiene, diet, and physical activity, all of which involve behaviours that are potentially controllable by the individual. In addition, outside of acute care settings, the effectiveness of most health care interventions is highly dependent on the individual's adherence to self-care activities such as taking medications, performing self-examinations and refraining from specific activities or habits.

High intake of fat (especially saturated fat) inform of snacks and high intake of soft drink coupled with low consumption of fruit and vegetables are still major problems contributing to health problems in Nigeria. Health security and improvement in health outcomes are an integral part of the global commitment to poverty reduction. The development of every nation is dependent on the nutrition and health status of its population. Whilst some countries have come to terms with, and focused on other ways of attaining good health like increasing physical activities and good nutrition, other nations like Nigeria, continue to concentrate on curative rather than preventive care. Good nutrition has been identified as one of the preventive ways of improving and maintaining good health. What one eats determine to a great extent the state of health one enjoys. The direct relationship between what one eats and the diseases one suffers has been amply demonstrated. In essence, we are what we eat (Layade and Adeoye, 2014; Moronkola, 2013).

Poor nutrition results in poor growth and development. It has also been implicated in the development of some risk factors and life threatening chronic diseases and deaths. Notable among these are cardiovascular diseases, stroke, hypertension, diabetes and some types of cancers which are all of public health concerns in Nigeria (Oguntona, 2010). The resultant effect of poor nutrition is low academic performance among students and low productivity in industry, agriculture and many other sectors of the economy. Furthermore, poor health is a big drain on government as well as individual's financial resources and other social services(Oguntona, 2010).

Fruits and vegetables are widely accepted as an essential foundation of a healthy diet. Some of the world's most widespread and debilitating nutritional disorders are caused by diets lacking in fibre, vitamins and minerals. High fruits and vegetables consumption is commonly recommended because plant foods contain a high proportion of water, are low in fats, provide high content of fibre and fructose, and are good sources of vitamins and minerals. It was found that increasing one's portion of fruits and vegetables a day lowered the risk of coronary heart disease by 4% and the risk of stroke by 6% (Oguntona, 2010). Several empirical studies have, however, shown that regular consumption of fruits and vegetables is associated with reduced risk of cancer, cardiovascular diseases, stroke, Alzheimer's disease, cataracts and age-related functional decline

(Da-Hong, Michiko, Naoko, Shikibu, Wakako, Nobuo, Hiroto, Hisao and Noriyoshi, 2016).

The health benefits of eating fruits and vegetables are numerous, and this may have informed the recommendation that at least 400g of fruits and vegetables be taken per person per day (World Health Organization (WHO), 2003). Increase in fruits and vegetables consumption can also lower blood pressure (Lord, Manlhiot, Tyrrell, Dobbin, Gibson, Chahal, Stearne, Fisher and McCrindle, 2015; Adelakun, 2012). It is noted that a sufficient amount of fruits and vegetables consumption is considered to be an active measure to help prevent some chronic diseases and to promote sustainable health and well-being. Healthy nutrition behaviour, especially fruits and vegetables consumption has been regarded as crucial factor in preventing obesity and many diseases. Fruits and vegetables are an important component of a healthy diet and, if consumed daily in sufficient amounts, could help prevent major diseases and certain cancers (Adelakun, 2012).

Vegetables are important sources of vitamins and minerals for the human diet. In a very broad sense, the term vegetables refers to edible plants, commonly collected and /or cultivated for their nutritional values. The definition of fruits and vegetables should always relate to their nutritional qualities and the health benefits attributed to them. Described from nutritional and health point of view, fruits and vegetables are low energy dense foods relatively rich in vitamins, minerals and other bioactive compounds as well as being good source of fibre (World Cancer Research Fund / American Institute for Cancer Research, 2007). Besides their aesthetic value in food presentation, vegetables enhance the nutritional quality of diets because of their richness in vitamins and minerals such as carotene (provitamin A), ascorbic acid, riboflavin, iron, iodine, calcium and host of other elements. In addition to their high concentration of micronutrients, vegetables provide little dietary energy, making them valuable in energy limited diets. The fibre content has been reported to have beneficial effects on blood cholesterol and aids in the prevention of large bowel diseases, while in diabetic subjects, they improve glucose tolerance (Institute of Food Technology, 2009).

Fruit consumption contribution to health optimization is unquantifiable. According to World Health Report 2002, low fruits and vegetables intake is estimated to cause about 31% of heart disease, 11% of stroke worldwide and about 19% of gastrointestinal cancer (WHO, 2002). In all, it is estimated that up to 2.7 million lives could potentially be saved each year if fruits and vegetables consumption was sufficiently increased. This could be due to the fact that fruits and vegetables provide essential vitamins, minerals, water and fiber that function in several ways to promote good nutrition and health. There is also convincing evidence that consumption of fruits and vegetables can promote weight loss and has been associated with decreased incidence of mortality from a variety of

chronic diseases such as cardiovascular diseases, stroke, hypertension, diabetes, obesity (Lord, *et'al*, 2015), and certain types of cancer (WHO, 2003).

Despite all the above mentioned well-established benefits of fruits and vegetables, a WHO study revealed that only three (Israel, Spain, and Italy) out of the twenty one studied countries met the average intakes of fruits and vegetables according to the WHO/FAO recommended level of 400 grams per day (WHO, 2003). Several researchers found that children, adolescents and youths are not eating fruits and vegetables as expected (Tubi, 2012). Further, nutritional surveys consistently show that many people do not meet consumption levels identified in nutritional guidelines (Hartley, Igbinedion, Holmes, Flowers, Thorogood, Clarke, Stranges, Hooper and Rees, 2016). Beech, Rice, Myers, Johnson and Nicklas (2009) confirmed that among youths, there are low daily intakes of fruits and vegetables. Otsuka, Yatsuya and Tamakoshi, (2015) provided further evidence of low consumption of fruits and vegetables among youths, with more than one-third of them on a daily basis not consuming fruits and vegetables at all.

Da-Hong, *et'al* (2016) presented a conceptual model of factors influencing eating behaviour. The model depicts three interacting levels of influence which impact eating behaviour: personal or individual, environmental and macro system. Personal factors that influence eating behaviour include attitude, beliefs, food preference and self-efficacy. Environmental factors include the immediate social environment such as family, friends, peer and other factors such as school, fast food outlets and social-cultural norms. Macro system factors include availability, distribution system and mass media. Apart the aforementioned factors, knowledge and attitude seem to have a negative impact on fruits and vegetables consumption. Studies have demonstrated that youth lack adequate nutritional knowledge about health benefits of fruits and vegetables (Olumakaiye and Ajayi, 2007).

In a study by WHO (2003) it was discovered that ,majority of the respondents agreed with the statements that fruits and vegetables are important in human diet (51%), prevent heart diseases (44%), slow down the development of some ailments (43%), prevent constipation (85%) and protect the body (49%). Also more than half of the respondents were neutral in their responses as to whether fruits and vegetables prevent some forms of cancer. They concluded that their indecision may be indicative of an inadequate knowledge on the fact that regular consumption of fruits and vegetables can reduce the risk of getting certain types of cancer. This assessment suggests that majority of the respondents were not knowledgeable about the nutritional and health benefits of fruits and vegetables. Many eating behaviours are initiated in childhood, track over the childhood years and continue into adulthood. There is a cause for concern, fruit as a natural product is being replaced with fruit substitutes such as snack, sweets,

and sugar drinks. This trend may be a reflection of the knowledge that most people view eating as a way to satisfy hunger rather than a means to maximize health while at school.

Attitude plays a significant role in fruits and vegetables intakes. Studies have shown that children and adolescents are willing to learn about healthier eating practices so as to improve their health (Yung, Lee, Ho, Keung,and Lee, 2010). Furthermore, both knowledge and attitude of adults to fruits and vegetables intake have been noted globally to be below nutritionally recommended and acceptable limits (United States Center for Disease Control (CDC), 2011). The picture in developing countries is not much different; adult intake of fruits and vegetables is low and in some cases none. Perera and Madhujith, (2012) concluded in their study that most students had a fair knowledge on some of the basic of fruits and vegetables consumption but lack knowledge of health benefits. They also concluded that students attitudes towards consumption of fruits and vegetable needs to be improved and since food habits are still developing during this period, it is important to help young people adopt healthy eating behaviours in order to improve long term health outcomes.

Knowledge is necessary but not sufficient for behaviour change. Even if people are well informed, they still need to be committed to perform a behaviour and then implement these intentions. Self-regulation technique integrates cognitive– behavioural intervention components that previous models of health behaviour (e.g Theory of Reasoned Action, Health Belief Model) have identified as crucial for behaviour change (such as intention formation, self-efficacy, finding benefits and barriers, planning, and relapse prevention). However, it is essential to put these components into a specific sequence (that is, feasible wish— outcome—obstacle—if-then plan). Mental contrasting can create strong goal commitments, whereas implementation intentions facilitate the implementation of strong goal commitments.

It is based on the aforementioned that the researcher investigated the effect of self-regulation and protection motivation-based nutrition intervention on knowledge of health benefits of fruits and vegetables consumption among pre-service teachers in Southwestern Universities, Nigeria

**Statement of the Problem**

Adolescents and young people experience dramatic physical growth and development along with psychosocial and cognitive changes during puberty. They also experience significant changes in their ability to assess and comprehend complex situations and information especially in their desire to become independent and unique individuals. The increased need for energy and nutrients among adolescents, combined with increasing financial independence, increasing need for autonomy when making food choices, and immature

cognitive abilities, places adolescents at nutritional risk (Story and Sang, 2005). Despite the obvious importance of adopting healthful eating practices, University students tend to engage in a number of problematic eating behaviour, including unhealthy dieting, skipping meals, high intake of fast foods, low intake of fruits and vegetables, and minimal consumption of dairy products as revealed by initial exploratory survey by the researcher.

University years are a period of significant change in the lifestyle of young adults and food patterns established during this time are likely to be maintained for life and may have a long-lasting influence on students' future health and the health of their future families. Many students are occupied with busy lifestyles, spending time in classes, social activities, peer groups, and other irregularly organized activities, and their dietary behaviour are based on rituals, convenience, and social influence. Additionally, young adults are often ambivalent about their future health and the role that nutrition plays. Due to the absence of chronic medical conditions in this age group, little attention has been paid to the diets of young adult.

Many studies have reported low fruit consumption across different population: elderly people in New York (Frongillo, Isaacman, Horan, Wethington and Pillemer, 2010), Finnish adolescents (Hoppu, Lehtisalo, Tapanainen and Pietinen, 2010), American-Indian and Alaska-Native Adolescents (Story and Stang, 2008), Finnish young men (Bingham et. al., 2010) and civil servants in Oyo State (Ibrahim, 2011), student of tertiary institution in Oyo State (Layode and Adeoye, 2014), adolescents in Oyo State (Ilesanmi, Ilesanmi, and Ijarotimi 2014) but data are seemingly deficient or readily unavailable about knowledge of health benefits and attitude towards consumption of fruits among undergraduates. Finding a way to motivate young adults to consume more fruits and vegetables would represent a way to avoid the development of body weight problems and chronic illness. Therefore, this study was prompted by the paucity of information on knowledge and attitude towards fruits and vegetables consumption, thus this study investigated knowledge of health benefits, attitude and consumption of fruits and vegetables among pre-service teachers in Southwesternern Universities, Nigeria

**Hypotheses**

The following null hypotheses were tested:

1. There will be no significant knowledge of health benefits of fruits and vegetables consumption among pre-service teachers in Southwestern Universities, Nigeria.

2. There will be no significant positive attitude towads fruits and vegetables consumption among pre-service teachers in Southwestern Universities, Nigeria
3. There will be no significant consumption of fruits and vegetables among pre-service teachers in Southwestern Universities, Nigeria
4. There will be no significant relationship between knowledge of health benefits and attitude towards fruits and vegetables consumption among pre-service teachers in Southwestern Universities, Nigeria
5. There will be no significant relationship between knowledge of health benefits and consumption of fruits and vegetables among pre-service teachers in Southwestern Universities, Nigeria
6. There will be no significant relationship between attitude and consumption of fruits and vegetables among pre-service teachers in Southwestern Universities, Nigeria

The data obtained will be useful to researchers who may wish to study issues relating to fruits and vegetable consumption. The study is also likely to be an eye opener to the students on the benefits of fruits and vegetables consumption. The findings are expected to underscore the need to design more health behaviour interventions in the future that implement experimental designs including theory-guided constructs to promote health behaviour.

The findings of this study will also be useful to non-governmental organizations and Ministry of Health, parents, medical and health workers and others concerned with well-being of students and adolescents in planning programmes to meet the unmet nutritional needs of students. Such programmes, if well designed and implemented may attract the attention of students who may likely accept, adopt and follow positive eating habits now and in future.

**Methodology**

The study employed the use of descriptive research design of survey type. Two hundred undergraduate teacher trainees in southwestern Nigeria were selected using multistage sampling procedure. Self developed types of questionnaire were used as instrument for data collection. The Fruits and vegetables Consumption Questionnaire (FVCQ), Knowledge of Health Benefits of Fruits and Vegetable Consumption Questionnaire (KHBFVCQ), Attitude Towards Fruits and Vegetable Consumption Questionnaire (ATFVCQ). The data was analysed using Chi-square for hypotheses 1-3 and Pearson product moment correlation for hypotheses 4-6.

The validity of the instrument was done by experts in Health related fields with background in nutrition science/education. To ascertain the reliability of the instrument, a pool of items were generated. These items were factor loaded. The

criterion for item retention was set at 0.6. Then after, the instrument was administered on a sample of twenty (20) pre-service teachers from Faculty of Education, University of Ilorin who were not part of the sample for the study. The data were collected and analysed using Cronbach Alpha. Knowledge of Health Benefits of Fruits and Vegetables Consumption Questionnaire (KHBFVCQ) yielded a reliability co-efficient of 0.78, Attitude Towards Fruits and Vegetables Consumption Questionnaire yielded a reliability co-efficient of 0.81 while Fruits and Vegetables Consumption Questionnaire (FVCQ) yielded a reliability co-efficient of 0.77. The overall reliability of the instrument is 0.78

The field testing of the instrument was also carried out using twenty (20) undergraduates from Faculty of Education, University of Ilorin, Ilorin, who were not part of the sample for the study. This acquainted the researcher with the procedures and problems that may be encountered during the actual study.

**Results**

**Hypothesis 1:** There will be no significant knowledge of health benefits of fruits and vegetables consumption among pre-service teachers in Southwestern Universities, Nigeria.

**Table 1: Chi-square table showing knowledge of health benefits of fruits and vegetables consumption among pre-service teachers in Southwestern Universities, Nigeria**

| Items | SA | A | D | SD | $X^2$cal | $X^2$crit | df | P |
|---|---|---|---|---|---|---|---|---|
| Consumption of fruits and vegetables is good for health | 33<br>11.0% | 98<br>32.7% | 102<br>34.0% | 67<br>22.3% | | | | |
| Eating fruits and vegetables reduces the risk of having cancer | 21<br>7.0% | 43<br>14.3% | 98<br>32.7% | 138<br>46.0% | | | | |
| Eating more dark green vegetables prevent heart diseases | 26<br>8.7% | 41<br>13.7% | 136<br>45.3% | 97<br>32.3% | 33.01 | 40.123 | 27 | .066 |
| Fruits and vegetables consumption prevents obesity | 44<br>14.7% | 67<br>22.3% | 117<br>39.0% | 72<br>24.0% | | | | |
| Consumption of fruits and vegetables prevents the onset of hypertension | 22<br>7.3% | 39<br>13.0% | 137<br>45.7% | 102<br>34.0% | | | | |
| One looks healthier when one eats fruits and vegetables regularly | 25<br>8.3% | 89<br>29.7% | 97<br>32.3% | 89<br>29.7% | | | | |
| Consuming fruits and vegetable makes one looks fresh | 41<br>13.7% | 97<br>32.3% | 59<br>19.7% | 103<br>34.3% | | | | |
| Eating fruits and vegetable reduces the risk of having stroke | 22<br>7.3% | 44<br>14.7% | 137<br>45.7% | 97<br>32.3% | | | | |
| Consumption of fruits and vegetables aids digestion | 45<br>15.0% | 102<br>34.0% | 86<br>28.7% | 67<br>22.3% | | | | |
| Eating fruits and vegetables promote sustainable health and well being | 41<br>13.7% | 66<br>22.0% | 124<br>41.3% | 69<br>23.0% | | | | |

Table 1 above revealed that there is no significant knowledge of health benefits of fruits and vegetables consumption among pre-service teachers in Southwestern Universities, Nigeria ($X^2$cal= 33.01, $X^2$crit= 40.123, df= 27, $p > .05$). Therefore, the null hypothesis is accepted. This finding is in agreement with WHO (2003) where she discovered that, majority of the respondents agreed with the statements that fruits and vegetables are important in human diet (51%), prevent heart diseases (44%), slow down the development of some ailments (43%), prevent constipation (85%) and protect the body (49%). Also more than half of the respondents were neutral in their responses as to whether fruits and vegetables prevent some forms of cancer. They concluded that their indecision may be indicative of an inadequate knowledge on the fact that regular consumption of fruits and vegetables can reduce the risk of getting certain types of cancer. This assessment suggests that majority of the respondents were not knowledgeable about the nutritional and health benefits of fruits and vegetables.

**Hypothesis 2:** There will be no significant positive attitude towards fruits and vegetables consumption among pre-service teachers in Southwestern Universities, Nigeria

**Table 2: Chi-square table showing attitude towards fruits and vegetables consumption among pre-service teachers in Southwestern Universities, Nigeria**

| Items | SA | A | D | SD | $X^2$cal | $X^2$crit | df | P |
|---|---|---|---|---|---|---|---|---|
| There is no good value to derive in consuming fruits and vegetables | 26<br>8.7% | 89<br>29.7% | 85<br>28.3% | 100<br>33.3% | | | | |
| One should avoid negative disposition towards fruits and vegetable consumption | 22<br>7.3% | 67<br>22.3% | 119<br>39.7% | 92<br>30.7% | | | | |
| One will loose appetite for eating fruits and vegetables if one consumes them regularly | 45<br>15.0% | 127<br>42.3% | 90<br>30.0% | 38<br>12.7% | 41.37 | 43.773 | 30 | .057 |
| I careless whether I eat fruits and vegetables or not | 64<br>21.3% | 92<br>30.7% | 88<br>29.3% | 56<br>18.7% | | | | |
| One should enjoy eating fruits and vegetables | 21<br>7.0% | 78<br>26.0% | 115<br>38.3% | 86<br>28.7% | | | | |
| Eating fruits and vegetable is a waste of money | 24<br>8.0% | 77<br>25.7% | 134<br>44.7% | 65<br>21.7% | | | | |
| I will rather use my money to buy soft drink (minerals) than fruits and vegetables | 56<br>18.7% | 159<br>53.0% | 52<br>17.3% | 33<br>11.0% | | | | |
| There is no benefit in consuming fruits and vegetables | 22<br>7.3% | 63<br>21.0% | 129<br>43.0% | 86<br>28.7% | | | | |
| Fruits and vegetables are meant for the sick | 44<br>14.7% | 92<br>30.7% | 91<br>30.3% | 73<br>24.3% | | | | |
| It is when one has surplus money to spend that one should buy fruits and vegetables for consumption | 54<br>18.0% | 102<br>34.0% | 105<br>35.0% | 39<br>13.0% | | | | |
| Fruits and vegetables are meant for the rich | 43<br>14.3% | 127<br>42.3% | 74<br>24.7% | 56<br>18.7% | | | | |

Table 2 above revealed that there is no significant positive attitude towards fruits and vegetables consumption among pre-service teachers in Southwestern Universities, Nigeria ($X^2$cal= 41.37, $X^2$crit= 43.773, df= 30, $p > .05$). Therefore, the null hypothesis is accepted. This tallied with the finding of Perera and Madhujith, (2012) who concluded in their study that most students had a fair knowledge on some of the basic of fruits and vegetables consumption but lack knowledge of health benefits. They also concluded that students attitudes towards consumption of fruits and vegetable needs to be improved and since food habits are still developing during this period, it is important to help young people adopt healthy eating behaviours in order to improve long term health outcomes.

**Hypothesis 3:** There will be no significant consumption of fruits and vegetables among pre-service teachers in Southwestern Universities, Nigeria

**Table 3: Chi-square table showing fruits and vegetables consumption among pre-service teachers in Southwestern Universities, Nigeria**

| Items | SA | A | D | SD | $X^2$cal | $X^2$crit | df | P |
|---|---|---|---|---|---|---|---|---|
| My consumption of fruits has increase in recent time | 29<br>9.7% | 76<br>25.3% | 113<br>37.7% | 82<br>27.3% | | | | |
| I do not like to consume fruits and vegetables | 56<br>18.7% | 111<br>37.0% | 99<br>33.0% | 34<br>11.3% | 23.96 | 32.671 | 21 | .068 |
| I can't go a day without eating fruits and vegetables | 12<br>4.0% | 28<br>9.3% | 103<br>34.3% | 157<br>52.3% | | | | |
| Fruits and vegetable are normal part of my meal | 16<br>5.3% | 25<br>8.3% | 140<br>46.7% | 119<br>39.7% | | | | |
| I enjoy eating fruits and vegetables regularly | 16<br>5.3% | 31<br>10.3% | 159<br>53.0% | 94<br>31.3% | | | | |
| When I am at home, I often eat fresh fruits and vegetables | 10<br>3.3% | 29<br>9.7% | 117<br>39.0% | 144<br>48.0% | | | | |
| I often eat fruits and vegetables as snack | 14<br>4.7% | 27<br>9.0% | 132<br>44.0% | 127<br>42.3% | | | | |
| I often eat fruits and vegetables as dessert | 11<br>3.7% | 16<br>5.3% | 169<br>56.3% | 104<br>34.7% | | | | |

Table 3 above revealed that there is no significant consumption of fruits and vegetables among pre-service teachers in Southwestern Universities, Nigeria ($X^2$cal= 23.96, $X^2$crit= 32.671, df= 21, $p > .05$). Therefore, the null hypothesis is accepted. This is in line with the submission of Tubi, (2012) who stated that several researchers found that children, adolescents and youths are not eating fruits and vegetables as expected. Further, nutritional surveys consistently show that many people do not meet consumption levels identified in nutritional guidelines. Beech, Rice, Myers, Johnson and Nicklas (2009) confirmed that among youths, there are low daily intakes of fruits and vegetables while Otsuka, Yatsuya and Tamakoshi, (2015) provided further evidence of low consumption of fruits and vegetables among youths, with more than one-third of them on a daily basis not consuming fruits and vegetables at all.

**Hypothesis 4:** There will be no significant relationship between knowledge of health benefits and attitude towards fruits and vegetables consumption among pre-service teachers in Southwestern Universities, Nigeria

**Table 4: Correlation table showing the relationship between knowledge of health benefits and attitude towards fruits and vegetables consumption among pre-service teachers in Southwestern Universities, Nigeria**

| | | Knowledge of health benefits of consumption of fruits and vegetables | Attitude towards consumption of fruits and vegetables |
|---|---|---|---|
| Knowledge of health benefits of consumption of fruits and vegetables | Pearson Correlation | 1 | .726 |
| | Sig. (2-tailed) | | .000 |
| | N | 300 | 300 |
| Attitude towards consumption of fruits and vegetables | Pearson Correlation | .726 | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 300 | 300 |

The table above shows that there is a significant high positive relationship between knowledge of health benefits and attitude towards consumption of fruits and vegetables among pre-service teachers in Southwestern Universities, Nigeria ($r=.726$, $p<.05$), therefore the null hypothesis is rejected. The result of this study is in agreement with (Margetts et al., (2007) who concluded that the perceived benefits of healthy eating affect behaviour but only if a person feels it is relevant for him-/herself, is motivated, and has sufficient knowledge to change his/her behaviour. Also in support is Zunft et al.,(2007) when they assessed healthy eating in 15 member states of European Union, it was found that about half of the respondents perceived low fat consumption as part of a healthy diet and just over 40% of the respondents perceived more fruits and vegetables as well as balance and variety as definition of healthy eating. Moreover, the pan-European survey respondents who believed that good health is a result of healthy eating ranked a low-fat diet (48%) the highest, followed by a balanced diet (43%), the intention to eat more fruits and vegetables (41%) and to the consumption of fresh, natural food (28%) as part a healthy diet

**Hypothesis 5:** There will be no significant relationship between knowledge of health benefits and consumption of fruits and vegetables among pre-service teachers in Southwestern Universities, Nigeria

**Table 5: Correlation table showing the relationship between knowledge of health benefits and consumption of fruits and vegetables among pre-service teachers in Southwestern Universities, Nigeria**

| | | Knowledge of health benefits of consumption of fruits and vegetables | Consumption of fruits and vegetables |
|---|---|---|---|
| Knowledge of health benefits of consumption of fruits and vegetables | Pearson Correlation | 1 | .501 |
| | Sig. (2-tailed) | | .000 |
| | N | 300 | 300 |
| Consumption of fruits and vegetables | Pearson Correlation | .501 | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 300 | 300 |

The table above shows that there is a significant moderate positive relationship between knowledge of health benefits and consumption of fruits and vegetables among pre-service teachers in Southwestern Universities, Nigeria ($r=.501$, $p<.05$), therefore the null hypothesis is rejected. This corroborates United States Center for Disease Control (CDC), (2011) who confirmed that both knowledge and attitude of adults to fruits and vegetables intake have been noted globally to be below nutritionally recommended and acceptable limits. The picture in developing countries is not much different; adult intake of fruits and vegetables is low and in some cases none.

**Hypothesis 6:** There will be no significant relationship between attitude and consumption of fruits and vegetables among pre-service teachers in Southwestern Universities, Nigeria

**Table 6: Correlation table showing the relationship between attitude and consumption of fruits and vegetables among pre-service teachers in Southwestern Universities, Nigeria**

| | | Attitude towards consumption of fruits and vegetables | Consumption of fruits and vegetables |
|---|---|---|---|
| Attitude towards consumption of fruits and vegetables | Pearson Correlation | 1 | .622 |
| | Sig. (2-tailed) | | .000 |
| | N | 300 | 300 |
| Consumption of fruits and vegetables | Pearson Correlation | .622 | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 300 | 300 |

The table above shows that there is significant relationship between attitude and consumption of fruits and vegetables among pre-service teachers in Southwestern Universities, Nigeria ($r=.622$, $p<.05$), therefore the null hypothesis is rejected. This is in line with Da-Hong, et'al (2016) who presented a conceptual model of

factors influencing eating behaviour. The model depicts three interacting levels of influence which impact eating behaviour: personal or individual, environmental and macro system. Personal factors that influence eating behaviour include attitude, beliefs, food preference and self-efficacy. The result is also in agreement with Olumakaiye and Ajayi, 2007) who stated that apart the aforementioned factors, knowledge and attitude seem to have a negative impact on fruits and vegetables consumption. Studies have demonstrated that youth lack adequate nutritional knowledge about health benefits of fruits and vegetables.

**Conclusion**

Based on the findings of this study, it was concluded that there was no significant knowledge of health benefits of consumption of fruits and vegetables among pre-service teachers in southwestern Nigeria. Also there was no significant positive attitude towards consumption of fruits and vegetables among undergraduate teacher trainees in southwestern Nigeria. It was also concluded that there was no significant consumption of fruits and vegetables among undergraduate teacher trainees in southwestern Nigeria. A significant relationship was found between knowledge of health benefits and attitude consumption of fruits and vegetables, health benefits and consumption as well as attitude and consumption of fruits and vegetables among undergraduate teacher trainees in southwestern Nigeria.

Based on the findings of this study, the following recommendations are made;

1. The findings of this study revealed the need for undergraduate teacher trainees in Southwestern Nigeria to be educated on health benefits of consumption of fruits and vegetable which may lead to reduction in mortality and morbidity as associated with inadequate consumption of fruits and vegetables. Hence, the need for nutrition education that will include fruits and vegetable consumption be part of GES courses in Universities in Southwestern Nigeria.
2. Since, the adverse health effects of none or inadequate consumption of fruits and vegetables are preventable. Efforts to address this factor through practice and policy will contribute to the health of students and improve consumption of fruits and vegetables will not only lead to enhanced health conditions but will also contribute to building healthier families and community
3. Authorities in Southwestern Universities should promote orchards and ensure that fruits and vegetables are part of diets provided by cafeterias operators. Fruits trees should be planted by tree managers and hall management should provide opportunity for fruits and vegetables sellers

## References

Adelakun, A.O. (2012). Effect of school based intervention on knowledge, attitude and consumption of fruits and vegetables among adolescents in two local government areas of Ibadan. Unpublished Master's project. Department of Human Nutrition, University of Ibadan, Ibadan, Nigeria

Ajala, J.A. (2005). Health education in wellness and sickness in this day age: Nigeria. Inaugural lecture series, Ibadan: University of Ibadan Press.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioural change. *Psychological Review, 84*(2), 191-215.

Beech, B., Rice, R., Myers, L., Johnson, C., & Nicklas, T. (2009). Knowledge, attitudes, and behavioural interventions to modify dietary fat and fruits and vegetables intake: A review of the evidence. *Preventive Medicine, 35*(1), 25-41.

Da-Hong W, Michiko K, Naoko M, Shikibu Y, Wakako F, Nobuo U, Hiroto H, Hisao S and Noriyoshi M. (2016). Psychosocial Determinants of Fruit and Vegetable Consumption in a Japanese Population. *International Journal of Environmental Research and Public Health*; 13, 786. Available at |www.mdpi.com/journal/ijerph

Hartley, L.; Igbinedion, E.; Holmes, J.; Flowers, N.; Thorogood, M.; Clarke, A.; Stranges, S.; Hooper, L.; Rees,K. (2016). Increased consumption of fruit and vegetables for the primary prevention of cardiovascular diseases. Cochrane Database System. Review.

Institute of Food Technology (IFT) (2010). Quality of fruits and vegetables. A scientific status summary by the Institute of Food Technology expert panel on food safety and nutrition. ; 44: (6), 1 – 5.

Layade A.A. & Adeoye I.B., (2014) Fruit and vegetable consumption among students of tertiary institutions in Oyo State. *ARPN Journal of Agricultural and Biological Science*, 6(6):1-5.

Lord,S. Manlhiot, C. Tyrrell, P.N. Dobbin, S. Gibson, D. Chahal, N. Stearne, K. Fisher, A. McCrindle, B.W. (2015). Lower socioeconomic status, adiposity and negative health behaviours in youth: A cross-sectional observational study. *Basic Medical Journal*; 9,(2), 76-91

Moronkola, O.A. (2013). Essays on issues in health. Ibadan: Royal People Nigeria Ltd.

Oguntona, C. (2010). Increasing cases of malnutrition among adolescents, worrisome. Retrieved from http://tribune.com.ng/index.php/health-news/13074-increasing-cases-of- malnutrition-among-adolescents-worrisome-nsn on 05/02/2018

Olumakaiye, M.F & Ajayi, O.A. 2007. Determinants of food choices of adolescents in southwestern Nigeria. *African Journal of Food, Agriculture, Nutrition and Development*, 7:1-4

Otsuka, R.; Yatsuya, H.; Tamakoshi, K. (2015). Descriptive epidemiological study of food intake among Japanese adults: Analyses by age, time and birth cohort model. *Basic Medical and Public Health Journal* 14, 309- 328.

Perera, T & Madhujith, T. 2012. The Pattern of Consumption of Fruits and Vegetables by Undergraduate Students: A case study. *Tropical Agricultural Research*, 23 (3): 261 – 271

Tubi, M.I, (2012). Improving nutritional knowledge, attitude and practices of school-age children to healthy eating through music nutrition education. Unpublished Doctoral thesis. Department of Human Nutrition, University of Ibadan

WHO. (2002). *The World Health Report, Reducing risks, promoting health. Geneva, World Health Organization*. Retrieved from http://www.who.int/whr/2002/en/

WHO. (2003). Diet, Nutrition and the Prevention of Chronic *Diseases*. (Report of a Joint WHO/FAO Expert Consultation. WHO

World Cancer Research Fund / American Institute for Cancer Research (2007). Food nutrition and the prevention of cancer: A global perspective. Washington DC, WCRF/AICR.