Food Consumption and Dietary Practices of Nigerians and Non-Resident Indians (NRIs) – A Virtual Study

M.Banupriya

(20PFD007)

Thesis Submitted to
Avinashilingam Institute for Home Science and
Higher Education for Women
Coimbatore – 641043.

In Partial Fulfillment of the Requirement for the Degree of

Master of Science in Food Service Management and Dietetics

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Certified as a Bonafide Research work

Signature of the Guide	Signature of the Co-Guide	Signature of the Head of the Department

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I INTRODUCTION

India and Nigeria have good cultural relations between them. According to the Indian High Commission in Abuja, around 55000 Nigerians live in India whereas 25000 Indian passport holders dwell in Nigeria. This study focuses on the consumption pattern of foods in Nigeria and NRIs residing in Nigerian cities.

Food consumption is defined as a series of consumption arrangements characterised by the types and quantities of food products consumed, as well as their combination in dishes and meals. Recently we are able to see food consumption and pattern changes due to the growth of population (Kearney, 2019). People's dietary preferences are influenced by a variety of factors, including religion, culture, and socioeconomic status. The leading cause of death in both developed and developing countries is diseases caused by dietary lifestyle changes, which have a significant influence in Non-Communicable Diseases(Shehu *et al.,* 2011). Whereas in under developed countries like Nigeria malnutrition (under nutrition) have been the major cause for mortality and morbidity. By studying and analysing how food consumption and dietary practices vary from country to country and between the socio economic levels within a country, changes can be done in implementing schemes and providing awareness to reduce the rate of mortality and morbidity.

Increased sugar, salt, saturated fat intake, as well as an unhealthy lifestyle (smoking, alcohol drinking, and physical inactivity) all contribute to significant noncommunicable disease risk factors (NCDs). People's food preferences have a significant impact on their quality of life. Excessive eating and undernutrition, as well as poor or imbalanced diets, are risk factors for a variety of chronic diseases. Unbalanced dietary consumption may result in a reduction in nutrient uptake in the body, exposing the individual to nutritional health issues. Good nutrition aids in the prevention of health problems, the promotion of active living, and the management of illness conditions in individuals who are infected or unwell (Haveman *et al.,* 2003).

The nutrition transition problem has been exacerbated by increased urbanisation and movement of inhabitants to urban centres, as well as diminished access to traditional and indigenous food resources (Albala et al., 2002). Traditional foods are foods that have been consumed by people for a long time and that support their health. They are foods that have been grown, produced, and harvested from the earth, are organic, and contain the highest levels of nutrition or are nutrient-dense (Umeh, 2007).

Due to its reduced access to indigenous food resources there is a replacement in diets by energy dense and convenience foods which are poor in nutrients. Food, nutrition and nutritional attributes are usually regarded as critical for human health and well-being (Levy-Costa et al., 2005). For a variety of reasons, including appropriate cardiovascular function, muscle strength, pulmonary ventilation, infection protection, wound healing, and psychological well-being, adequate nutrition is critical (Martin, 2006). So a diet that provides appropriate nutrients (carbohydrates, fats, proteins, vitamins, and minerals) in quantities commensurate with the body's needs for body construction, energy supply, defence, and regulatory activities. Increased consumption of processed foods can cause serious health problems such as osteoporosis, cancer, hypoglycemia, cardiovascular disease, adrenal exhaustion, metabolic, endocrine, and reproductive abnormalities, as well as parasite and yeast infections. The major incidence of obesity and diet-related diseases like diabetes, coronary heart disease (CHD) and certain types of cancer are due to the increased consumption of refined foods with less physical activity (Shetty, 2002).

Nigeria is quickly urbanising, with an ever-increasing population. The food systems that are followed in both urban and rural areas are the key distinguishing features that lead to nutritional difficulties, and hence actions are required to quickly remedy the problem. In general, urban poor are more reliant on food purchases and their diets are more diverse than rural poor, allowing for better access to quality food and nutrients. However, given purchasing power, their reliance on the market for food makes urban poor more susceptible to prices and other market stocks, resulting in undernutrition (Mohiddin et al., 2012). In contrast, urban households tend to consume outside food and more

processed foods than rural households (Herskowitz, 2018) and hence they are more vulnerable to health related risks (Kengne *et al*., 2017).

The three main groups of Nigerian are Hausa, Yoruba, and Igbo and also 250 ethnic groups in altogether. The people's eating habits influences both religion and affluence. Numerous food dishes were shared not only across the Nigerian divide, but also beyond Africa's borders, though they are known by different names. Fried bean cakes are a great illustration of this. It is consumed as a snack and for breakfast in Nigeria. It is referred to as Akara in the south and Kosai in the north. It can be produced at home or purchased at a low price from roadside food vendors.(Egwuonwu, 2019).

Nigerians eat mostly two types of foods: cereals and root crops/tubers (Accueil, 2019). Meat is used in a variety of recipes, and poultry farming is the most common method of meat production in Nigeria. Rice, cassava, maize, and yam are Nigeria's main staples; maize is the most commonly consumed staple, with 20% of the population eating it more than thrice a week, either as green corn or as maize grain cooked into flour.

The main staples are legumes such as cowpea, peanut, and soybean. Plantain and sorghum are two more essentials they eat. Meat products, vegetables such as onion, carrot, cabbage, cucumber, pepper, tomato, and okra are other common non-staple foods. Fruits such as orange, mango, pawpaw, guava, pineapple, and grapefruit are consumed by many Nigerians. According to Hobbs (2017), because of the country's size and the variety of regional cuisines, determining a national favourite food for Nigeria is difficult.Jollof rice is a spicy one-pot dish made with basic rice, tomatoes, onions, and pepper that is frequently eaten with egusi soup (made with powdered melon seeds and bitter leaf or fried plantains with pounded yam or fufu) in Nigeria and across West Africa (maize).

Thyme, salt, pepper, ginger, garlic, nutmeg, and stock cubes are among the spices commonly used in Nigerian dishes. Any meat or fish can be added to common recipes, whether main meals or soups like pepper soup, based on availability, cost, and desired taste.In both industrialised and developing countries, several studies show that household socioeconomic position is a key

driver of dietary diversity. The high-income groups were able to supplement dietary staples with micronutrient-rich foods like meat, fish, poultry, eggs, milks, and dairy products, as well as have greater access to a variety of foods and vegetables, whereas the poorer groups tend to consume only small amounts of such foods, instead opting for more monotonous diets based on cereals, roots, and tubers (Mayen et al., 2014).

A 'traditional' eating pattern and a 'transitional' dietary pattern were discovered. The 'transitional' kind was primarily from the upper socioeconomic strata, with a higher percentage of energy coming from fat and cholesterol, but lesser fibre. The 'traditional diet' was linked to a higher healthy score in terms of fruit and vegetable consumption. Urbanization was related with a high environmental impact on animal-based dietary patterns, but not with a low environmental impact on plant-based food patterns. In both cases, a typical, high-fat food pattern with a moderate environmental impact persists.Most of the studies on dietary diversity pattern in developing countries focused on specific population like women, children, adults with little attention on households which makes up the fabric of the society and lies at the centre of most policies.

Food and nutrition security is built on four pillars: availability, access, use and utilisation, and stability. Use refers to the socioeconomic aspects of food and nutrition security in the home, which are influenced by knowledge and habits. Dietary diversity is defined as an increase in the variety of foods available across and within food groups to ensure appropriate consumption of vital nutrients for optimal health (Ruel, 2002).. Many African households' meals are essentially plant-based, consisting primarily of starchy staples (which have a low quantity of micronutrients that are frequently difficult to digest), with little or no animal-based proteins and few fresh fruits and vegetables (Arimond et al., 2004).

The both food and nutrient consumption, often referred to as dietary pattern which helps to predict the diet related diseases risk rather than individual food or nutrient . It describes the overall diets with respect to the foods items, food groups, and nutrients included with associated frequency

and the quantity habitually consumed. Therefore, recording and analysing the food frequency consumption of households characterized by the usual intake of eating habits have become a focus in food policy programs Methods for defining dietary pattern includes the approaches like the use of numerical indexes, different scoring and weighting schemes to measure adherence to a dietary pattern. This approach has been predefined based on the scientific data that has been recommended.

The identification of family diet characteristics can be used to develop nutritional interventions and public-health programmes targeted at improving the diets of communities, providing a full picture of food consumption habits. As dietary patterns are likely to vary, a comparative study was done to know the possible differences in eating patterns derived from different populations and as a result of study there is a differences in the stages of nutritional transition, changing food preferences and choices (Udoh*et al.*, 2019).

Mekonnen et al. (2019) discovered that nutrient-dense food intake was low, and that urban households had greater dietary diversity than rural households, with the differences focusing on fruit and dairy consumption. The nutrient adequacy between them depends on both dietary diversity and quantities they consumed. The expenses spend on food by eating outside is commonly seen in urban than rural Nigerians.

Many studies prove that there is a vast difference between the consumption pattern of Nigerians. People had changes their dietary pattern from healthy diet to convenience diet. Consumption of food which are high in calorie and fats and physical inactivity which leads to health risk. Keeping all these facts the present study was formulated with the following objectives.

Objectives

- To study the food consumption and dietary practices of Nigerian
- To study the food consumption and dietary practices of Non Resident Indians(NRIs)
- Compare the food habits among both the Nigerian and Non Resident Indians(NRIs) in Nigeria

II REVIEW OF LITERATURE

The literature pertaining to the study entitled, **"Food Consumption and Dietary Practices of Nigerians and Non-Resident Indians (NRIs) – A Virtual Study"** was carried out involving the following headings:

A. Nigeria as a Country

B. Lifestyle Habits of Nigerian and NRIs

C. Dietary Patterns of Nigerian

D. NRIs Dietary Pattern

A. Nigeria as a Country

Nigeria is located on the western coast of Africa which has a diverse geography, with climates ranging from arid to humid equatorial.The national capital is Abuja, in the Federal Capital Territory, which was created by decree in 1976. Lagos, the former capital, retains its standing as the country's leading commercial and industrial city. The country has abundant natural resources with large deposits of petroleum and natural gas. Modern Nigeria dates from 1914, when the British Protectorates of Northern and Southern Nigeria were joined (Falola, 2022).

Nigeria is bordered to the north by Niger, to the east by Chad and Cameroon, to the south by the Gulf of Guinea of the Atlantic Ocean, and to the west by Benin. Nigeria is not only large in area- larger than the U.S. state of Texas- but also Africa's most populous. The current population in Nigeria was 215,819,444 (United Nations Data, 2022)

Nigeria has a tropical climate with variable rainy and dry seasons, depending on location. A savanna climate, with marked wet and dry seasons, prevails in the north and west, while a steppe climate with little precipitation is found in the far north. In general, the length of the rainy season decreases from south to north. The humidity generally is high in the north, but it falls during the harmattan (the hot, dry northeast trade wind), which blows for more than three months in the north but rarely for more than two weeks along the coast (Falola, 2022).

The main vegetation pattern of Nigeria includes a) Forest zone was located in the southern part of Nigeria with more tress which had mangrove swamps (salt water and fresh water) located around the delta region of River Niger and Cross River and the fresh water swamp at the northern region . b) Savannahs includes trees cover with grasses and flowers. There are three categories within the savannah zone. These include the Guinean forest-savanna mosaic comprising plains of tall grasses and trees , Sudan savannah has shorter grasses and trees and the Sahel savannah which is made up of patches of grass and sand and it is found in the North-East and c) Montane land is typically found in the mountains close to the Cameroon border (Abass, 2022).

Hausa was an official language of the northern states and is the most widely spoken language although English is the official language of Nigeria. In addition to English, Hausa, Yoruba, Igbo, Fula, Pidgin English, and Ijaw.are widely spoken (Sasu, 2022).

It is estimated that 50 percent of Nigerians are Muslim, 40 percent are Christian, and that the remaining 10 percent practice various indigenous religions. While Muslims can be found in all parts of Nigeria, their strongest footholds are among the Hausa and the Yoruba. Christianity is most prevalent in the south of Nigeria. The vast majority of Igbo are Christians, as are many Yorubas (Association of Religion Data Archives - ARDA, 2015).

Nigerians obtain a living mainly from agricultural production. Most are small-scale subsistence farmers who produce only a little surplus for sale and also earns additional income from one or more cash crops and from the sale of local crafts. Root crops notably yams, taro, and cassava are the main food crops in the south, while grains and legumes such as sorghum, millet, cowpeas, and corn (maize) are the staple crops of the north. Rice is also an important domestic crop. Trees notably oil palm, cacao, and rubber trees are the principal industrial crops of the south, while peanuts (groundnuts) and cotton are produced in the north. Cocoa beans, from the cacao tree, are the major agricultural export.

Western influences, especially in urban centers, have transformed Nigerian eating habits like city dwellers are familiar with the canned, frozen, and prepackaged foods found in most Western-style supermarkets. Foreign restaurants also are common in larger cities.. Most urban Nigerians seem to combine traditional cuisine with a little of Western-style foods and conveniences. Rural Nigerians tend to stick more with traditional foods and preparation techniques (Amy McKenna, 2019).

Most Nigerian cuisine tends to be based around a few staple foods accompanied by a stew. In the south, crops such as corn, yams, and sweet potatoes form the base of the diet. These vegetables are often pounded into a thick, sticky dough or paste. This is often served with a palm oil based stew made with chicken, beef, goat, tomatoes, okra, onions, bitter leaves, or whatever meats and vegetables might be on hand. Fruits such as papaya, pineapples, coconuts, oranges, mangoes, and bananas also are very common in the tropical south.

In the north, grains such as millet, sorghum, and corn are boiled into a porridge-like dish that forms the basis of the diet. This is served with an oil based soup usually flavored with onions, okra, and tomatoes. Sometimes meat is included, though among the Hausa it is often reserved for special occasions. The Fulani cattle herders, fresh milk and yogurt are common even though there may not be refrigeration. (Adegboye, 2016).

Alcohol is very popular in the south but less so in the north, where there is a heavy Islamic influence. Perhaps the most popular form of alcohol is palm wine, a tart alcoholic drink that comes from palm trees. Palm wine is often distilled further to make a strong, gin like liquor. Nigerian breweries also produce several kinds of beer and liquor.

B. Lifestyle Habits of Nigerian and NRIs

A random-effects meta-analysis and meta-regression epidemiologic model were employed to determine prevalence and number of smokers in Nigeria in 1995 and 2015. The results showed that the prevalence of current smokers in Nigeria was 10.4 percent and 17.7 percent for ever smokers. Urban and rural dwellers had relatively similar rates of current smokers and ever

smokers . Estimated median age at initiation of smoking was 16.8 years. and also an increase in number of current smokers from 8 to 11 million. The pooled mean cigarettes consumption per person per day was 10.1 accounting for 110 million cigarettes per day and over 40 billion cigarettes consumed in Nigeria to be concluded that one out of ten Nigerians still smokes daily (Adeloye et al., 2019).

Ono *et al*., (2021) conducted a secondary analysis of the 2012 Global Adult Tobacco Survey (GATS) for non-institutionalised adults aged 15 years and older. Variables included current Smoking less tobacco use, socio demographic characteristics and perceived harm of SLT use and Chi-square test was used to examine associations and binary logistic regression to assess predictors of current SLT use. All analyses were conducted with sample-weighted data. The results reveals that higher number of current SLT use for those in the South-East region rural area males between the age group of 45–64 years those with no formal education and those with no perception of harm from SLT use. The recommended targeted interventions were framed to increase awareness of the harmful effects of SLT use especially among residents of the South-East, those in rural areas, males, and individuals with no formal education.

This study aims to analyse tobacco use by secondary data analysis from the 2013 Nigerian Demographic and Health Survey (NDHS), assessing the prevalence, pattern, and socio-demographic correlates of tobacco use among Nigerians aged 15-49 years. Primary Sampling Unit defined on the basis of Enumeration Areas from the 2006 census was used. Head of selected household, all men and women aged 15-49 were studied. Data was collected using questionnaire then chi-squared test and a binary logistic regression model were used in the analysis.

The results elicited that those aged 25-34 years and ≥35 years were more likely to smoke cigarettes than those aged 15-24 years and those who had done secondary education and above were less likely to smoke cigarettes than those with primary education and below those in the southern geo-political region were more likely to smoke cigarettes than those from the north. Moreover, Muslims were less likely to smoke than Christians (Aniwada *et al*., 2018).

The study was conducted using a semi-structured questionnaire to estimate the prevalence of current alcohol use among adults 18 years and older living in urban slums in Enugu South East Nigeria. Current use of alcohol means use of any or all alcohol beverages in the past 4 weeks. The safe limit of alcohol was defined using WHO guidelines. Study duration was 5 months. From the result showed that the overall prevalence of current use of alcohol was 66.7 percent (males 75.7% and females 58.8%).

The commonest alcoholic beverage consumed was beer. The peak age of consumption was 40 - 49 years followed by 50 - 59 years. Increasing age, cigarette smoking positively correlated with drinking more than the recommended limit and the recommended limit for CLD and a high prevalence of current alcohol use among urban slums in Enugu. Public health educational measures for reducing alcohol consumption should be encouraged. (Onodugo, O. D *et al* ., 2019)

Lasebikan, *et al*. (2016) conducted a study on baseline measures of a single arm nonrandomized intervention which aimed to determine in semirural community settings the prevalence and correlates of alcohol use as well as the effectiveness of ASSIST Linked SBIRT on harmful and hazardous alcohol use in the rural youth and adult dwellers and most probably the first in Sub-Saharan Africa. The results were elicited the prevalence of lifetime alcohol use was 57.9 percent and current alcohol use 27.3percent and the current drinking was associated with younger age, male gender, being unmarried, low educational status, low or low average socioeconomic class, Christianity, and unemployment

The most common consumed alcoholic beverage is beer and local spirits. It also stated that more than two-thirds of the current drinking population were moderate or high risk drinkers. This is pertinent considering that drinking alcohol is associated with a risk of adverse health consequences such as alcohol dependence, cancers, and injuries. Screening, brief intervention, and referral for treatment for unhealthy alcohol use should be integrated into community care services in Nigerian rural communities.

A random effects meta-analysis, using the DerSimonian and Laird Method was employed on the individual study estimates to pool crude national and

subnational summary estimates of the prevalence of physical inactivity in Nigeria. Fifteen articles were selected for the review were across the southern and northern parts of Nigeria. From the study it is observed that about 50 million persons in Nigeria do not engage in sufficient physical activity on a weekly basis. According to the regions, South–west had the lowest prevalence of physical inactivity in Nigeria and the highest prevalence were seen in the South–east and South–south regions, the prevalence of physical inactivity was high among urban dwellers compared to rural dwellers and also male has high prevalence than female (Adeloye, D *et al.,* 2021)

The study was conducted by Adekoya, A *et al* ., (2020) to examine the effect of physical activity level (PAL) on the prevalence of obesity among adults (20 - 64 yr) in Abeokuta, Ogun State, Nigeria. Both male and female adults were randomly selected to participate in the study. Body mass index (BMI) was measured using cut-off ≥ 30 kg/m2 and the physical activity assessed according to WHO/FAO work classification. The result shows that mean BMI was high above the cut-off for rural male, urban male and urban female but lower than the cut-off among rural female .The pattern of physical activity significantly fell on the sedentary side, mostly among the urban subjects. The PAL among the population, emphasize the adverse effect of sedentarism on the increasing risks of obesity and chronic degenerative diseases.

The Indian population in South Africa has a sedentary lifestyle and their physical activity participation levels are rarely reported. A cross sectional study was aimed to determine the level, types and barriers of physical activity among South African Indians residing in Durban, KwaZulu-Natal Province of South Africa with self-completed the global physical activity questionnaire (GPAQ) that included supplementary questions on demographics, specific activities and exercise history.

The most common physical activities were walking , weight lifting and jogging. Younger participants were more involved in high intensity acitivities, while those over the age of 50 years preponderantly engaged in moderate intensity the physical activity levels were higher in males than in females.

.Barriers to physical activity included lack of time , post exercise pain (n = 43, 32.6%) and physical ailments. The study concluded that less than half of the study population meet the required levels of physical activity and that intervention strategies, such as time management and encouragement from medical professionals are required to improve the levels of physical activity among this population (Kader, 2018).

C. Dietary Patterns of Nigerian

The cross sectional household-level data from two urban locations selected to know its dietary patterns through a multistage random sampling procedure in southwest Nigeria. Socio/demographics were documented using a descriptive analysis. The pattern of food subgroups was determined using the factor analysis, while the test for differences was examined using Mann Whitney U. Using factor analysis method , five distinct dietary patterns were emerged and named as vitamin A, modern protein, roots, and cereals patterns with 50.7 percent variance contribution rate.

The test of difference across the two locations revealed significant disparities in the observed dietary pattern with respect to vitamin A food, beef meat, spices and poultry. The study had concluded that there is a great differences in the dietary pattern of the urban population.. Although, both dietary patterns had healthful elements of the diets, there is a low consumption of iron rich foods was observed (Adebola, *et al*., 2020).

A cross sectional study was conducted among adults in Bida Local Government Area, Niger State to assess the nutritional status and dietary pattern, prevalence of risk factors and chronic diseases . The study population comprised of 111 (52.91%) female and 99 (47.1%) male respectively. The data was collected using anthropometric indices like body mass index, waist circumference, blood pressure, blood glucose level, life style habits and Food frequency questionnaire (FFQ) was used to collect data on dietary habits of the respondents.

The result obtained shows high occurrence of Above waist circumference were seen among the females than that of male due to accumulated fat during pregnancy. The increase in BMI due to attitudinal and

cultural changes are associated with obesity and blood glucose level, high blood pressure are due to a unhealthy eating habit and life style changes (Maude *et al* ., 2020)

Bennett *et al*., (2022) done a systematic review to address the gaps and understand differences in dietary intakes and influencers of dietary habits of ethnic groups worldwide. A systematic search was conducted through three databases (Pubmed, Web of Science and Scopus) and manual searches, generating n = 56,647 results. Overall, food group intake particularly fruit, vegetable and fish intake and diet quality scores were seen to differ between ethnicities. Overall Black/African American groups were reported to be among the poorest consumers of fruit and vegetables, while Asian groups achieved high diet quality scores due to higher fish intakes and lower fat intakes compared to other groups.

The Cross-sectional study was conducted to know dietary patterns in four African populations and examine their association with obesity.. They main component used for analysis was dietary intake data collected from an FFQ developed for PaCT to ascertain dietary patterns in Tanzania, South Africa, and peri-urban and rural Uganda.. From the study they identified two dietary patterns: the Mixed Diet pattern characterized by high intakes of unprocessed foods such as vegetables and fresh fish, but also cold cuts and refined grains; and the Processed Diet pattern characterized by high intakes of salad dressing, cold cuts and sweets Comparing with two dietary pattern , the Processed Diet pattern was associated with obesity (Holmes *et al.,* 2018).

A descriptive cross-sectional study design was conducted to assess the Knowledge of Women of Reproductive Age (WRA) on diets as a Modifiable Risk Factor (MRF) of obesity. A multi-stage sampling technique and semi-structured, interviewer-administered questionnaire were adopted to elicit information. A 12-point scale was used to assess the knowledge of diets, Body mass index to assess the nutritional status and 7-day food frequency questionnaire was framed to know their frequency consumption of high calorie foods.

The research focused on assessing the level of knowledge of women of reproductive age on modifiable risk factors to obesity and consumption pattern of

some selected locally available high calorie food items. Findings from the study states that the participants had good knowledge of diets as a modifiable risk factor of obesity and the prevalence of obesity was still 18.6 percentage. The study also showed that there was no significant difference between knowledge of this modifiable risk factors to obesity and BMI of respondents.. Focus for future interventions of the study must include public health nutrition education policy to support promotion of healthy eating in addition to regular exercise and increase public awareness on the fatal consequences of not adhering to healthy lifestyles and behaviours (Oyewole *et al.,* 2018).

The mixed-methods interviews insix communities to measure individual dietary diversity, household food access, and short-term nutritional status, with specific attention to animal-based foods and the cultural and economic values attached to them, in two interior forest and four forest-edge communities. Multivariate analysis of dietary compositions revealed differences in food categories and types of meat consumed between forest environments. The results elicited that people in forest-edge communities consumes less bush meat and dark green leafy vegetables, and more pulses, domestic meat, fish, eggs, dairy, other vegetables, sweets, condiments, and non-red palm oil compared to interior forest communities .

The interior forest communities reported that consuming more meat, poultry, and fish (including skin) collected from the wild, and more cultivated vitamin A-rich fruits and vegetables compared to forest-edge communities. Households from interior forest communities exhibited significantly higher household food insecurity access scores, fewer women of reproductive age who achieved minimum dietary diversity scores, and lower average mean upper arm circumference and Cultural salience of animals as food was mostly seen in forest edge communities (Friant *et al*., 2019).

Twenty communities were selected and a stratified sampling technique of commonly consumed dishes and their contribution to the energy and nutrient intake of adults in southeast Nigeria . Twenty-four-hour dietary recall, focus group discussion (FGD) and a 3-day weighed food intake conducted in each of the selected communities were used to collect the data, which were analyzed

using percentages, means and standard deviations. Student's *t*-test was used to compare means across sex and locations (urban/rural).

Seventy-one recipes of commonly consumed cassava, rice and yam-based dishes were documented. Commonly consumed dishes contributed > 70 percent of the energy and nutrient (protein, calcium, iron, zinc, vitamin A (RE), thiamin, riboflavin, niacin and vitamin C) intake of adults in southeast Nigeria though there were few exceptions. The high contribution of the commonly consumed dishes to the total energy and nutrient intake of adults in southeast Nigeria reveals that prioritizing them for comprehensive chemical analysis and use in the development of a country-specific food composition database would be a way forward (Ifeoma, *et al*., 2019).

A multi-staged random sampling technique, with a cross-sectional survey was carried out on 400 adult respondents using a well-structured questionnaire to determine the snack consumption pattern of adults and the effect of consumption of certain snacks on the health status of adults. Food frequency questionnaire (FFQ) and 24hour dietary recall were also given to the respondents. For the dietary intake assessment, Food and Agricultural Organisation's (FAO) 'Guidelines for Measuring Household and Individual Dietary Diversity' was used to calculate individual's dietary diversity score (DDS) before recording.

The study concluded that most people skip meals; and snacks serve as a substitute for such skipped meals. Only few people frequently consume healthy snacks such as fruits and vegetables. Most people were discovered to eat pastries as snacks and these pastries (such as cakes and pies) are highly processed foods which could increase the risk of non-communicable diseases (NCDs) in their consumers (Onyenweaku *et al*., 2019)

The study undergoes with an earlier report contained in the Abia State Economic Empowerment and Development Strategy (ABSEEDS) document which showed that the residents in the state were predominantly artisans, traders and farmers . Generally, fruit consumption in Africa from infancy throughout adulthood is reported to be

low . The low consumption may be attributed to lack of availability and associated high cost and scarce.

Household income, having vegetable garden and perception of affordability of fruits are the other factors considered with fruit intake. The study states that cooked vegetables were consumed more than fresh vegetable and the usage of palm oil in preparation of soups and sauces which shown to increase the vitamin A content but it contains high saturated fats so people should be educated to use it moderately. On the other hand, consumption of foods considered less healthy such as fast foods/pastries, sweet/chocolate, soft drinks, tea/coffee with sugar was on few days of the week. The average consumption of alcoholic beverages was also low, in Beirut, Lebanon ,an Islamic, while in the South Eastern part of Nigeria excessive consumption of alcohol is viewed as a social misconduct. The main source of carbohydrates from cassava , protein from beef and fish . Chicken and eggs were the least consumed (UgwunnaUkegbu *et al* ., 2013).

A cross sectional descriptive survey carried out in Abia state on the food consumption patterns existing among the adult population, which has either positive or negative implications for NCDs. A multistage sampling technique was used to select samples from six (three urban and three rural) Local Government Areas of the state. Questionnaire was framed to obtain information on demographic and socio-economic characteristics, as well as food consumption patterns. Data analysis was carried out using SPSS Version 17.0.

The study concluded that the adults, regardless of residence maintained their African traditional food habits and had low intake of foods considered to be less healthy. However, the consumption of fruits which are considered to have potential health benefits was very low. Health education and routine monitoring strategies aimed to promote and sustain the consumption of these traditional foods and avoidance of less healthy ones were suggested (Ukegbu et al., 2013).

The study conducted to elicit the details on food (groups) consumption patterns, and average nutrient adequacy and HDDS and their linkages with components of the food systems. Results shows that nutrient dense animal source foods including eggs and milk and milk products were consumed by less

than 40 percent of households while fruits and meat were consumed by less than 60 percent of households, on average. In general, urban households had higher dietary diversity than rural households in consumption of fruits and animal source foods

Among 12 food groups, consumption of legumes, oils and fats, and vegetables were associated with increase in household mean probability nutrient and there is a large shortfalls among 11 nutrients were observed in consumption of iron, vitamin B_{12}, and riboflavin with probability of adequacy being 0.2 or below, followed by niacin, vitamin C, and zinc with corresponding probability of adequacy ranged between 0.48 and 0.58. Further, results suggested that mobile phone ownership by the household head, household's access to electricity, improved sources of water for household consumption, and percent of the community with improved sanitation were strongly associated with HDDS (Mekonnen *et al* .,2019).

The study was conducted using a semi-quantitate food frequency questionnaire, and through a cross-sectional study and computed the proportions of foods commonly consumed, and collected data on anthropometric characteristics. The median total energy intake per day from these carbohydrate sources was 1034 kcal (interquartile range (IOR) 621.5-1738.6 kcal). The main carbohydrate food eaten was rice followed by fufu and bread . The prevalence of overweight and obesity was 63 and 73 percent of the women in the study were either overweight or obese compared to 56 percent of men. The study shown that parboiled long grain white rice is now the most commonly consumed carbohydrate by urbanized Nigerians (Akarolo*et al*., 2013).

The study was carried out to investigate changing food habits, eating behaviour, and perceived health related quality of life quality of life of adults in Oyo State, Nigeria using descriptive cross-sectional study was used as a mixed method approach with aged 50 – 70 years were selected using systematic random sampling. Twelve Focus Group Discussions (FGDs) were conducted using FGD guide to explore earlier food culture. A semi-structured, interviewer-administered questionnaire was used to collect information on socio-demographic and anthropometric characteristics, food habits, eating behaviour,

24-hour dietary recall and PHQoL. Energy and nutrients intake were determined using adapted total dietary assessment software.

From the result it is elicited that there is a transition from indigenous to westernised food habits and bad eating behaviour is high among adults in Oyo State. Burden of overweight and obesity and dietary intake are positively correlated with perceived health-related quality of life. Promotion of healthy eating habits and life styles is needed among the participants to achieve quality of life (Akinrinade et al., 2018).

A comprehensive procedure was followed with the aim of developing a culturally adapted semi-quantitative FFQ of 123 food items .FFQ is clearly a valuable tool for ranking individuals according to their nutrient intake. Consequently, this developed FFQ helps in the identification of risk groups for diet-related diseases.,. The developed tool was specially designed for urban adult Kenyans and it is a valid and reproducible tool that can be applied in future epidemiological studies to accurately rank urban adult Kenyans according to their dietary intake as well as allow investigations into the associations of diet with risk of disease in urban Kenya (Real *et al* ., 2020).

D. NRIs Dietary Pattern

The study was conducted by Naicker *et al* ., (2015) tro assess the dietary quality and patterns of an Indian population in KwaZulu-Natal with reference to the high prevalence of non-communicable disease a cross-sectional study where diet was assessed using a validated quantitative food frequency questionnaire. Mean intakes were compared to the World Health Organization goals. Dietary quality was determined by index construction and dietary patterns by factor analysis.

The means for the deficient index reflected a moderate diet quality whereas, the excess index reflected good diet quality. The Pearson partial correlation coefficients between the deficient index and risk markers were weak , the excess index was inversely correlated with waist circumference for the whole sample. Two factors were identified based on percentage of fat from each food : factor 1 (meat and fish versus legume and cereal pattern), fat added in food

preparation; and Factor 2 (nuts and seeds versus sugars and visible fat pattern), which accounted for obvious fat.

The medians for waist circumference, blood glucose, cholesterol and triglyceride levels showed significant decreasing trends for factor 1. The medians for blood glucose and cholesterol showed significant decreasing trends for factor 2 . A shortfall of fruit and vegetable, fibre and n-3 fatty acid intake in the diet is highlighted. When assessing the diet quality and patterns, guidance on the prudent use of added fats may lead to a healthier lifestyle reducing the prevalence of non-communicable disease.

The study conducted by Delisle *et a*l., (2009),) using cluster analysis and a random sample technique were used to assessed the dietary patterns and quality in Bubi immigrants (from Equatorial Guinea and comparing with different diet quality indexes. A 99-item food frequency questionnaire was administered, body weights, heights, socio-demographic and health information was collected during interviews. Usual intakes were collapsed into 19 food groups. Cluster analysis of standardized food intakes per 1000 kcalories was performed. Dietary quality was appraised using the Alternative Mediterranean Diet Score, the Alternative Healthy Eating Index and scores of micronutrient adequacy and prevention based on WHO/FAO recommendations.

Two dietary patterns were identified. The 'Healthier' pattern, was confirmed by two dietary quality indexes, featured a higher consumption of fish, fruits, vegetables, legumes, dairy products and bread while the 'Western' pattern included more processed meat, animal fat, and sweetened foods and drinks. One third of the subjects were in the 'Healthier' food cluster were independently associated with the healthier diet. Consumption of traditional foods was unrelated to dietary pattern,

Overall, Bubi diets were protective because of high intakes of fruits and vegetables and monounsaturated fat (olive oil), but not with respect to sugar, cholesterol, omega-3 fatty acids and fibre. Less than two thirds of subjects had adequate intakes of iron, calcium and folate in both dietary phenotypes. Body mass index, physical exercise, and self-reported health and cardiovascular disease condition showed no significant association with the dietary pattern.

III METHODOLOGY

The methodology pertaining to the study entitled, **"Food Consumption and Dietary Practices of Nigerians and Non Resident Indians (NRIs) – A Virtual Study"** was carried out involving the following steps.

D. Selection of subjects in Nigeria through Online Mode

E. Identification of Nigerians and Non-Resident Indians (NRIs)

F. Eliciting details on

- **Background information**
- **Anthropometric indices**
- **Food consumption patterns**
- **Dietary practices**
- **Lifestyle habits**

Due ethical clearance was obtained from the Institutional Human Ethics Committee AUW/IHEC/FSMD- 21-22/XPD-06 (Annexure I).

A. Selection of Subjects in Nigeria through Online Mode

Nigeria is located on the western coast of Africa which has a diverse geography, with climates ranging from arid to humid equatorial (Reuben Kenrick Udo, 2022). It is one of the most densely populated countries in Africa, with approximately 216.7 million (Demographics of Nigeria, 2022). Nigeria's population comprises of 200 ethnic groups, 500 indigenous languages and two major religions — Islam and Christianity. The classifications of ethnic groups are the Hausa, Fulani in the North, the Igbo in the Southeast and the Yoruba in the Southwest (World Bank Country Overview – Nigeria, 2015). There is a vast difference in food consumption and dietary habits of Nigerians and Non-Resident Indians (NRIs). Nigeria is a multicultural country with a diverse cultural food habits. The people's eating habits influences both religion and affluence (Adebayo, 2016). Thus, the present study was undertaken to find out difference in food consumption pattern and other contributing factors among the Nigerians and Non-Resident Indians.

Nigerians and Non-Resident Indians in the age range of 18-50 years were selected for the study. Google form was formulated to assess the various aspects like background information, anthropometry, food consumption pattern, dietary practices and lifestyle habits.

B. Identification of Nigerian and Non Residetial Indians (NRIs)

Purposive sampling technique was followed in selection of participants (Nigerians and Non Resident Indians) from Nigeria through online mode**.** A total number of 75 adults comprising both male and female in the age group of 18- 50 years were selected for the study. Among the 75 selected adults 50 adults were Nigerians and 25 adults were Non Resident Indians residing in Nigeria. The current tax law Act 1964 (www.incometaxindia.gov.in, 2022) states that "An Indian citizen who stays abroad for employment or is carrying on business for an uncertain duration is a non-resident. Both male and female in the age group above 18 to 50 years and those who were willing to participate in the study were selected.

Inclusion Criteria

- Adults between the age group of 18 – 50 years.
- Both male and female adults.
- Willing to participate in the study

Exclusion Criteria

- Age group below 18years
- Age group above 50years
- Pregnant women
- Not willing to participate in the study

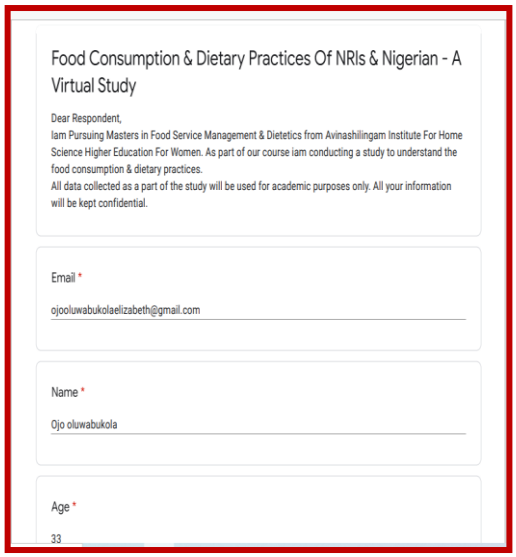
C. Eliciting details on

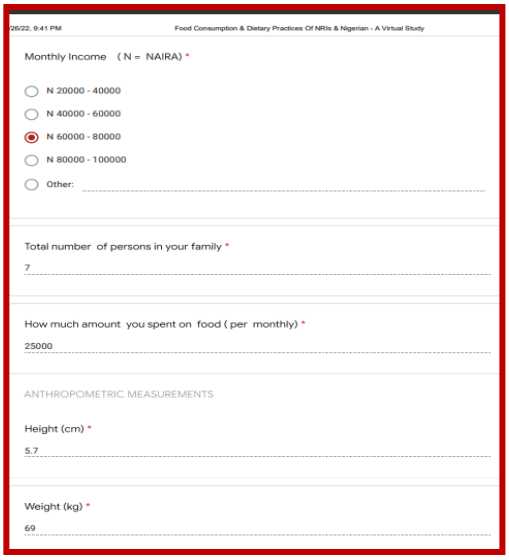
i) Background information

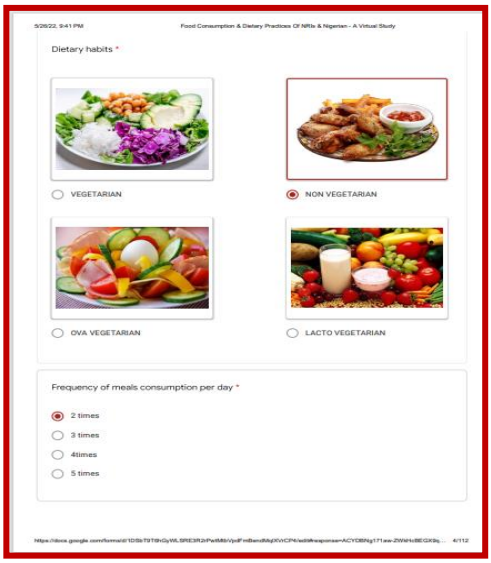
The general details given in the Google form. Google Forms is a service that allows us to collect information via simple web forms (Kishore Kumar, 2016). The general details given in the Google form were name of the respondent, age, gender, area of residence, email ID, these information's were asked for easy contact in case of any further information required from them. Socio-demographic details included the type of family, number of family members, monthly income, educational status and marital status, the amount spent on food/monthly these informations were collected to know the background information of the selected adults.

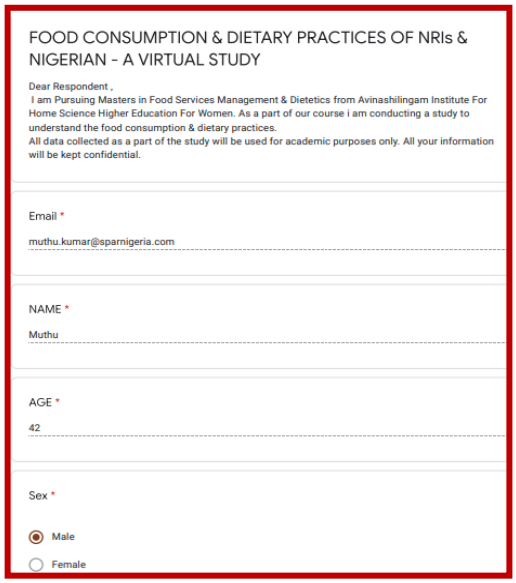
Steps followed in sending online questionnaire are

- The questions on background information, anthropometry measurements, food consumption pattern, dietary practices and lifestyle habits were typed in the Google form in the online mode. The Google form has various kinds of pattern and style for constructing the questions. In this present study, the question pattern included both short and multiple choice questions.
- After the construction of the Google form a short link was created for sharing the Google form among the Nigerians and Non-Resident Indians in Nigeria
- The Google form was shared through different online modes like WhatsApp groups, and Mail and it was shared with the adults in the age range of 18-50 years who were residing in Nigeria.









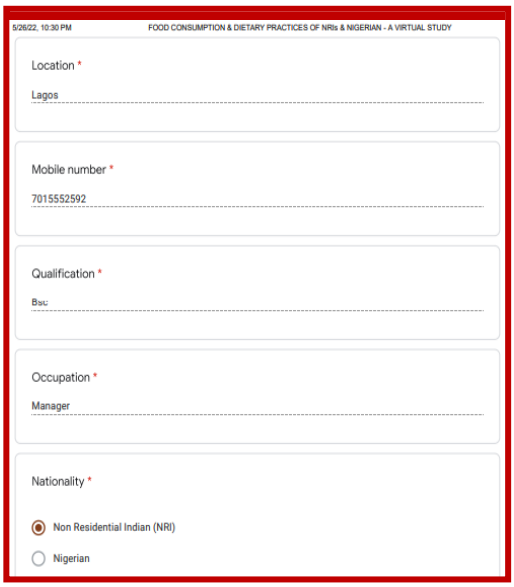


Plate 1: Formulated Google Form

ii) Anthropometric Indices

The subjects were asked to enter the current height (cm) and weight (kg) in the Google form and from the data filled in the corresponding Body Mass Index was calculated.

Body mass index (BMI) is a measure of body fat based on height and weight that applies to adult men and women. According to WHO (2020) Body Mass Index can be calculated using the formula

BMI = Weight in kg/Height in m²

Body Mass Index is commonly used to classify underweight and obesity in adults. BMI less than 18.5kg/m^2 was classified as underweight, 18.5- 24.9 kg/m^2 was classified as normal, BMI of 25 – 29.9 kg/m^2 were classified as overweight and BMI 30- 34.5 kg/ m^2were classified as Grade I obese , BMI between 35 – 39.9 kg/ m^2 were classified as Grade II obesity and BMI above 40 kg/ m^2 were classified as Grade III obesity according to WHO standards of classification.

iii) Food consumption patterns

The repeated arrangements of consumption, characterized by types and quantities of food items and their combination in dishes and meals, are termed food consumption patterns (Gerbens-Leenes and Nonhebel, 2002).

Food consumption pattern was assessed by framing finite lists of food and beverages with response categories to indicate usual frequency of consumption over the time period. Food frequency questionnaire included 114 food items for Nigerian and 95 items for Non-Resident Indians (NRIs)

iv. Dietary pattern

Dietary assessment is an evaluation of food and nutrient intake and dietary pattern of an individual or individuals in the household or population group over the time. It is one of the four approaches in nutritional assessment to evaluate the nutritional status of the individuals comprehensively (Gibson, 2005).

Dietary pattern - Dietary patterns are defined as the quantities, proportions, variety, or combination of different foods, drinks, and nutrients in diets, and the frequency with which they are habitually consumed.

i) The eating pattern of the selected Nigerians and Non-Resident Indians (NRIs) were elicited through the food habits, meal pattern, food allergies, skipping of breakfast regularly or weekly and fasting practices

ii) Diet for special conditions like cough, cold , diarrhoea and foods taken during festive seasons like New year, New yam , Raman were also elicited.

v. Lifestyle Habits

Lifestyle has a significant influence on physical and mental well- being. Living a healthy lifestyle can help prevent chronic diseases and long term illness. Hence, information on the physical activity, smoking, beverages and alcoholic consumption were elicited. Their main physical activities includes Running, walking, jogging, pushups and work out in gym at home.

vi. Interpretation of Data

Data analysis and interpretation is the process of assigning meaning to the collected information and determining the conclusions, significance and implications of the findings. It is an important and exciting step in the process of research (Mohan, 2007).

All the data obtained through online survey Google form were consolidated tabulated and represented graphically.

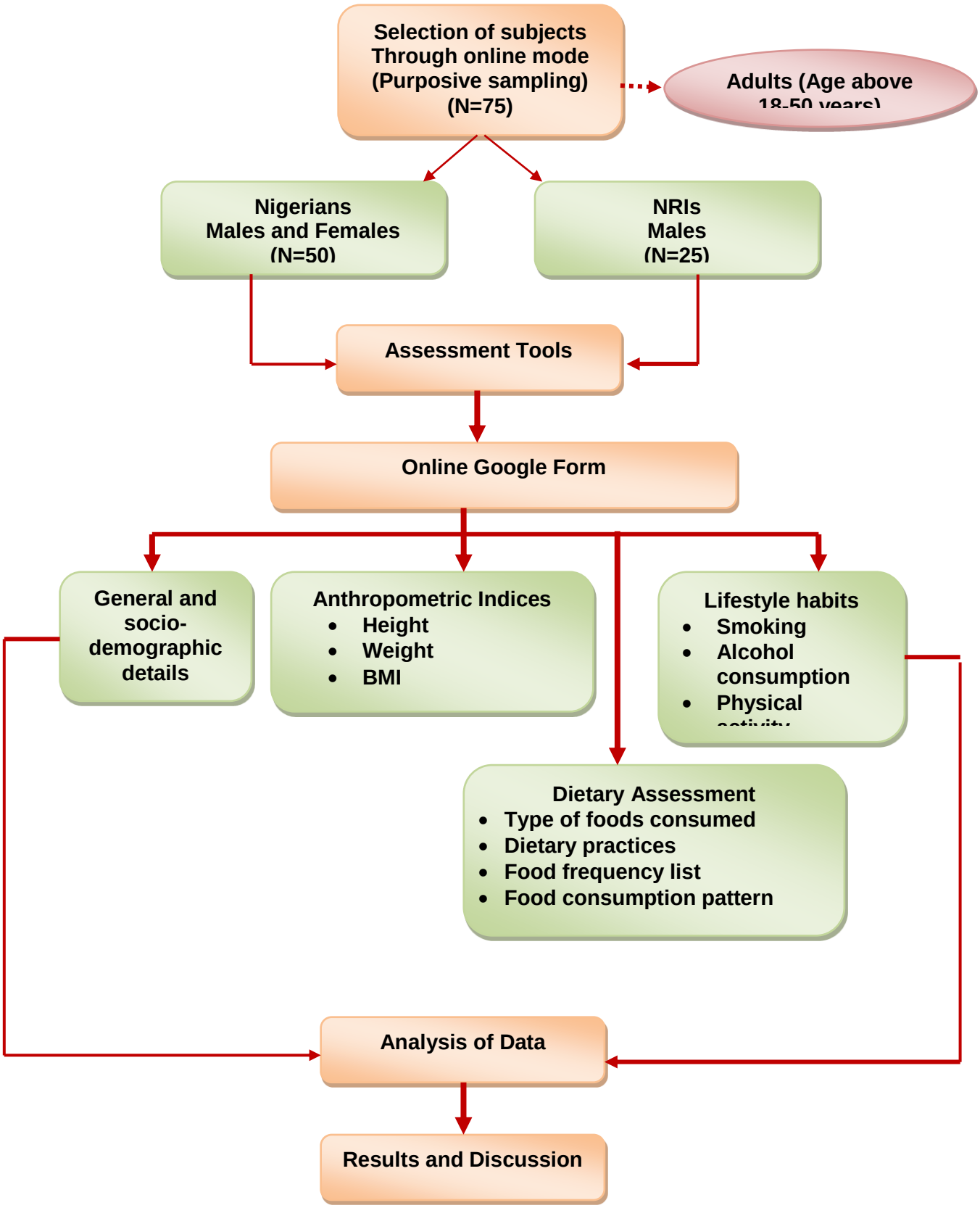


Figure 1: Research Design

IV RESULTS AND DISCUSSION

The results obtained in the present research study entitled **"Food Consumption and Dietary Practices of Nigerian and Non Resident Indians(NRIs) – A Virtual Study "** are discussed under the following headings

A. Socio-Demographic Profile

B. Anthropometric Indices

C. Food Consumption Pattern

D. Dietary Practices

E. Lifestyle Habits

A. Socio- Demographic Profile

1. Age and Gender Distribution of the Selected Nigerians and Non-Resident Indians

The age group and the gender distribution of both men and women is given in the following Table I and Figure 2.

Table I

Age and Gender Distribution of the Selected Nigerians and Non-Resident Indians

Age Group (yrs)	Nigerians N= 50		NRIs N = 25
	Male N= 38	Female N = 12	Male N = 25
21 – 25	3	2	1
26- 30	14	5	Nil
31- 35	9	5	2
36- 40	7	Nil	5
41- 45	2	Nil	5
46 – 50	3	Nil	12

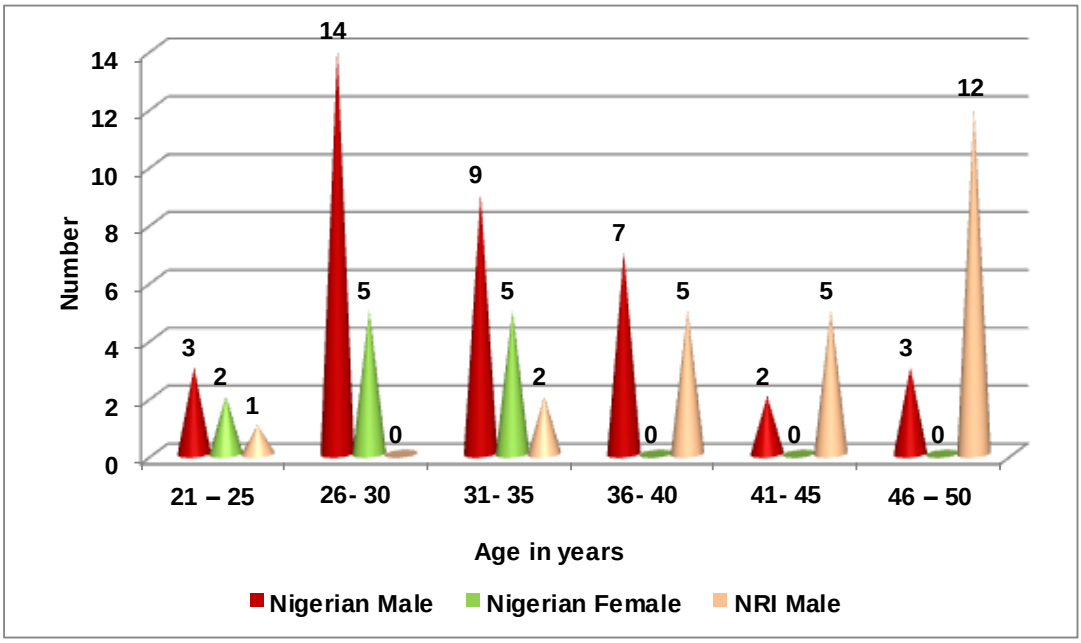


Figure 2: Age and Gender Distribution

Table I depicts the total number of selected Nigerians and Non-Resident Indians (NRIs). It is clearly evident there were no females in Non-Resident Indians (NRIs). A total of 75 were taken among them 50 were Nigerians and 25 were NRIs residing in Nigeria. Out of 50 selected Nigerian adults 38 were male and 12 were female .The maximum numbers of male and female were more in the age group of 26 – 35 years in Nigeria. Only two males were in the range of 41–45 years. Ten female Nigerians were between the age group of 26-35 years. Among the total number of selected Non Resident Indians (NRIs) 12 were in the age group of 46-50 years, followed by 10 selected adults between the range of 21–25 years. It was observed that the total number females were less compared to males due to low employability compared to males.

A study conducted by United Nation in 2020 revealed that from the total population of 216.6 million, around 50.6 percent were male and 47.4 percent were female.

2. Marital status of the selected Nigerians and Non-Resident Indians.

The marital status of the selected Nigerians and Non-Resident Indians (NRIs) is shown in the Table II and Figure 3.

Table II

Marital Status of the Selected Nigerians and Non-Resident Indians

Marital status	Nigerians N = 50	NRIs N = 25
Married	20	24
Unmarried	30	1

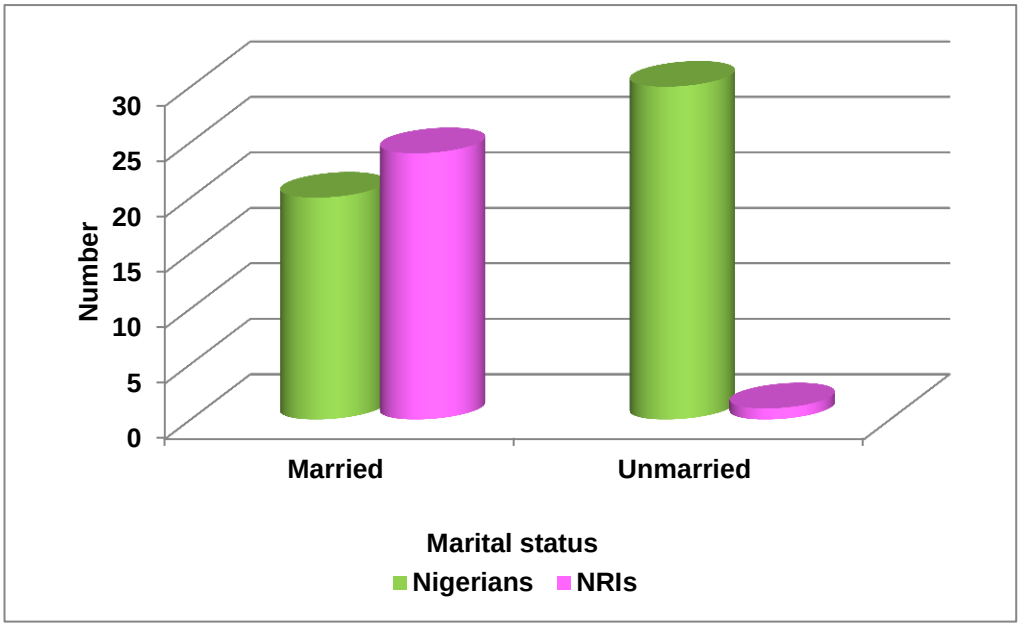


Figure 3: Marital Status of the Selected Nigerians and Non-Resident Indians (NRIs)

The details of the adults according to the marital status shows that out of 50 selected Nigerians, twenty were married and thirty were unmarried. In NRIs out of 25 adults, twenty four were married and one was unmarried. Nigerian men are mostly likely to get married between the age of 30 – 35 years and the women above the age of 20 years. All the selected women were married. According to Nigeria Demographic and Health Survey, 2013, the median age of getting married was 18 years among Nigerians. Half of women aged 25-49 were married by age 18 and 61 percent were married by age 20.

3. Educational Qualification

Educational qualifications refer to the official confirmation, usually in the form of a certificate, diploma or degree, certifying the successful completion of an education program or a stage of a program. The Table III shows the educational qualification of the adults in Nigerian and Non- Resident Indians (NRIs) in Nigeria.

Table III

Educational Qualifications of the Selected Nigerians and Non-Resident Indians (NRIs)

Educational Qualification*	Nigerian N= 50	Non Resident Indians (NRIs) N = 25
Secondary education		
SSCE*	7	Nil
Tertiary education		
Under Graduates	19	16
Post Graduates	4	8
Diploma	20	1

* Senior Secondary Education

Nigeria's education system comprises three different sectors of education were basic education (nine years), post-basic/senior secondary education (three years), and tertiary education (four to six years), depending on the program of study.

The educational qualification of the selected adults showed that from the total of 50 selected Nigerians , twenty adults had done their diplomas, nineteen have completed their graduation, seven Nigerian adult completed till higher secondary and four of the selected adults have done their post graduation . The number of selected NRIs who completed under graduation and post graduation were sixteen and eight out of twenty five adults..

It was found that overall literacy rate of Nigerian was lower than Non-Resident Indians. Nigeria's literacy rate in 2018 was 62.02 percent, there was a 10.94 percent increase from 2008, in which 40 percent of men and 18 percent of women were literate (Hollie Nielsen, 2021). . Overall the literacy rate in Nigeria was found to be lower. The number of graduates and undergraduates were more among Non-resident Indians (NRIs).

4. Monthly Income of the Selected Nigerians and Non-Resident Indians (NRIs)

Monthly income means the gross countable income received or projected to be received during the month or the monthly equivalent. The monthly income of the selected Nigerian and Non-Resident Indians **(NRIs)** are shown in the Table IV, Table V and Figure 4.

Table IV

Monthly Income of the Selected Nigerians

Monthly income *(Naira)	**Indian Rupees**	**Nigerian N= 50**
20000 – 40000	3800 - 7600	10
40000 – 60000	7600 - 11400	22
60000 – 80000	11400 - 15200	12
80000 – 100000	15200 - 19000	5
400000	76000	1

*** 1 naira = 0.19 in Indian rupees**

Table IV projects the income level of the selected Nigerian adults. Maximum number of the selected Nigerians earned between 40000 to 60000 naira which is 7,600 – 11,400 in Indian rupees, which was very less income compared to Non-Resident Indians (NRIs). Twelve selected Nigerian earned a

monthly income between 60000 – 80000 naira and ten adults between the ranges of 20000 to 40000 naira. These selected Nigerians were employed as salesman in spar, self employment like selling of indomie (instant noodles) and wick fixing, supervisor, porter, accountant, merchandiser, procurement personnel and personal assistant. According to African Development Bank (AfDB) data (2016) the average monthly income of Nigerians middle income group was between 75,000-100,000 naira.

Table V

Monthly Income of the Selected Non-Resident Indians (NRIs)

Monthly Income (Rs)	**Naira**	**Non Resident Indians(NRIs) N = 25**
30k – 60k	160643 - 321294	2
60k – 90k	321294 - 480998	5
90k – 1L20k	480998 - 642482	11
Above 1L 20k	Above 642482	7

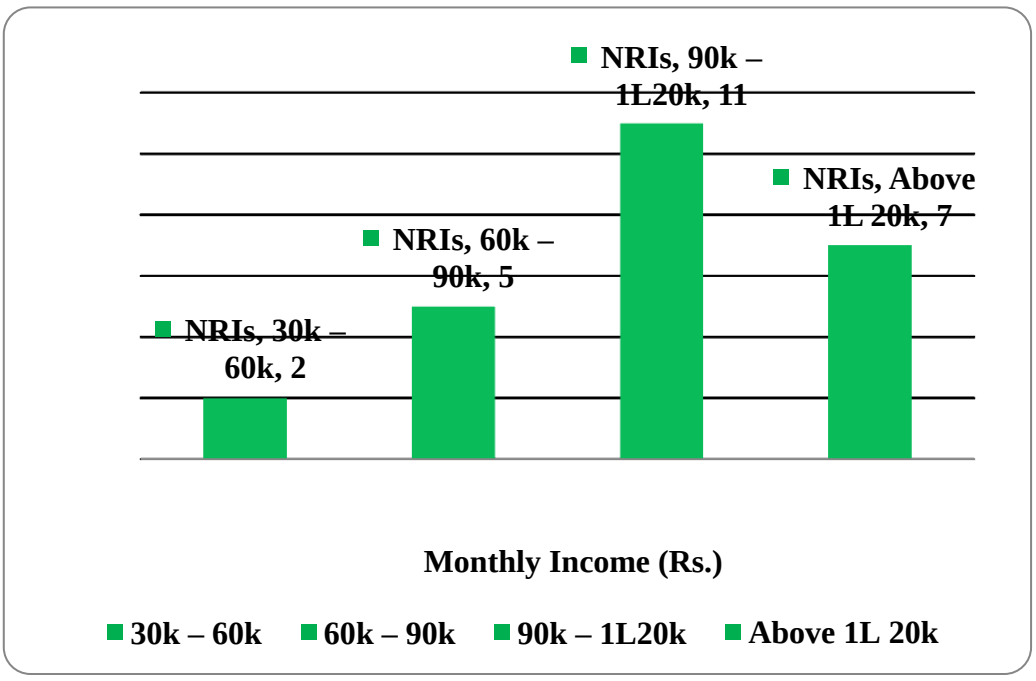


Figure 4: Monthly Income of the Selected Non-Resident Indians (NRIs)

The above Table V indicates the monthly income of the Non-Resident Indians (NRIs) residing in Nigeria. Most of the selected Non-Resident Indians (NRIs) (11) earned a monthly income between the ranges of 90k – 1L20k. Minimum of two selected Non-Resident Indians (NRIs) earned, a income between 30k – 60k. All the selected Non-Resident Indians (NRIs) were in the position of Spar branch manager, assistant manager in different departments of spar like electronics, store manager and Home Meal Replacement department manager. All the Non-Resident Indians (NRIs) were in higher positions in comparison to Nigerians.

5. Distribution of number of persons in the family

The distribution of number of family members is depicted in the below Table VI.

Table VI

Number of persons in the family of Nigerians

Number of persons in a family	**Nigerian N = 50**
2 – 4	25
6 – 8	14
10 – 12	11

None of the Non-Resident Indians (NRIs) were residing with families in Nigeria. About 25 Nigerians were having two to four persons in the family. The results are par with the study conducted by Doris Dokua Sasus (2022) which states that there is an average of five members in the family of Nigerians. The reason behind having more number of family members were due to lack of knowledge of family planning , poverty, lack of education and the head of the

family wanted their offspring's to do farming which needed more number of family members to carry out the work and manage it.

6. Distribution of money spend on food per month

The following table shows the distribution of amount that spend on food per month by both Nigerian and Non Resident Indians (NRIs) in Nigeria.

Table VII

Distribution of Money Spend on Food per Month

Total amount that spent on food (naira)	**Rupees**	**Nigerians N= 50**	**Non Resident Indians (NRIs) N = 25**
10k – 30k	1867 – 5602	36	13
31k – 51k	5789 – 9524	10	7
52k – 72 k	9711 – 13446	2	2
73k – 93 k	13632 – 17367	NIL	2
94k – 1 L 14k	17554 – 21660	2	1

Maximum number of 10000 – 30000 naira was spend on food by both Nigerians and Non-Resident Indian(NRIs). Minimum of four Nigerians and Non-Resident Indian(NRIs) spent about 52000- 72000 naira. According to 2019 expenditure pattern report, Nigeria's spending capacity for both food and non-food items total upto N40 trillion in which 56.65 percent of the household expenditure was spent for food, and the remaining 43.35 percent was spent for non-food items (Juillet 2020).

B. Anthropometric Indices

1. Categorization of the Anthropometric Indices of the selected adults

A person's weight in kilograms divided by the square of the person's height in metres (kg/m2) gives the Body Mass Index. The Table VIII shows the categorization of the anthropometric indices of the selected adults.

Table VIII

Categorization of the Anthropometric Indices of the Selected Nigerians and Non-Resident Indians (NRIs)

BMI (kg/m^2)	**Nigerian N= 50**	**Non Resident Indians (NRIs) N = 25**
Normal (18.5 – 24.9)	26	4
Overweight (25 - 29.9)	16	16
Grade I obesity (30 – 34.9)	6	4
Grade II obesity (35 – 39.9)	2	1

- **WHO classification on BMI 2020**

From the table VIII, it is clearly observed that twenty six Nigerians and four selected Non Resident Indians (NRIs) were having normal body mass index. A similar pattern was observed among both the Nigerians (16) and Non Resident Indians (NRIs) (16) in the category of overweight. Six numbers of the selected Nigerians and four selected Non-Resident Indians (NRIs) were in grade I obesity. Minimum of two selected Nigerians and one selected Non-Resident

Indians (NRIs) came under the category of grade II obesity. All the selected female Nigerians were in the category of overweight or obesity. The number of Nigerians was more in grade I and grade II obesity. A study by Davies Adeloye, et al 2021 stated that there were 21 million overweight and 12 million obese persons in Nigeria, with a prevalence considerably higher among women in 2020.

C. Food Consumption Pattern

1. Food consumption pattern of Nigerians

A food consumption frequency (FFQ) includes a finite list of food and beverages with response categories which indicates usual frequency consumption of food commodities over the time period. Table IX projects the frequency of food consumption of food.

Table IX

Consumption of Cereals and Cereal products and Pulses and Legumes

Cereals and cereal products	Pulses
Parboiled rice 	Double beans (white) (*Phaseolus lunatus)* 
Garri flour*	Double beans (brown)

* Garri flour made from cassava (tapioca) or maize

a. Consumption of Cereals and Cereal products and Pulses and Legumes

The cereal consumption pattern of the selected adults showed that forty percent of the selected Nigerians consumed parboiled rice and bread on a daily basis as their staple food. On a weekly basis they took Noodles (68%) and Garri flour porridge (62%). Sona masori rice, maida flour, macaroni and sooji were consumed very less occasionally compared to that of other cereals.

Among pulses Nigerians consumed more of varities of double beans as it was added to make" ewa riro " (stewed beans) or Nigerian bean porridge. Pulses like pigeon pea or fio –fio and soya chunks were consumed occasionally. Pigeon pea or fio – fio was consumed in the form of porridge or it was combined with yam, meat or fish to make a sauce as we stir fry the vegetables. Rarely Nigerians consumed black urad dhal as the price was high compared to other pulses.

b. Green leafy vegetables, Other vegetables and Roots and tubers

Table X

Consumption of Green leafy vegetables, other vegetables and Roots and Tubers

Green leafy vegetables	Other vegetables	Roots and Tubers
Bitter leaves (*Vernoniaamygdalina)* 	Okro / ladies finger 	Cassava (*Manihot esculenta Crantz)*  
Ora / Oha leaves *(Pterocarpus mildbraedi)i* 	Bell pepper 	Irish potato *(Solanum tuberosum L)* 

The green leafy vegetables like lettuce was consumed regularly by 32 percent of the selected Nigerians, bitter leaves and ORA / OHA were consumed on weekly basis. Mostly all green leafy vegetables were made as soup and stews along with other vegetables or meats. The other green leafy vegetables which were grown abundantly in that region are Chaya leaves, Ofe ugbogor, Yakwa, uziza, but it was observed that these green leafy vegetables were not consumed by the selected Nigerians because of their lesser availability in the market. Almost 78 and 56 percent of the adults consumed onion and tomatoes on daily basis as it was added in every dish which was prepared by them. Other vegetables like Okra and bell pepper was consumed to the

maximum. Occasionally they consumed gourd varieties like ivy gourd (28%) and yellow pumpkin (44%). Vegetables like spring onions and green chillies were consumed occasionally.

The staple foods of the Nigerians were rice and roots and tubers. Main roots and tubers consumed was Irish potato and cassava(tapioca) The roots and tubers like yam,(54%) carrot (44%), sweet potato (34%) were consumed weekly once by the selected adults of Nigerians, whereas about 36 percent of them consumed carrot daily. Nigerians consumed recipes made from cassava flour like “garri”, “fufu” and “abacha” for their breakfast as porridge, rice cake, stir fry and salad. Nearly fifty eight percent of the selected Nigerians did not consume radish in their diet. .

c. Fruits, Nuts and oils consumption patterns

Table XI

Consumption pattern of Fruits, Nuts and oils

Fruits	Nuts	Oils
Bread fruit / ukuwa 	Egusi seeds *(Cucumeropsis mannii)* 	Red palm oil 
Green banana 	Kolanut *(Cola acuminate)* 	Soya bean oil 

With regard to fruit consumption pattern they regularly consume apples, oranges, bread fruit and green banana on a daily basis**.** The fruits like watermelon, grapes, papaya and pineapple were consumed on a weekly basis.

The consumption pattern of the nuts and oil seeds like melon seeds or Egusi (42%), kolanut (40%), almond (32%) and peanut (34%) were taken on a weekly basis by the selected Nigerians. Thirty eight percent of the selected adults took cashewnut and raisins on monthly basis due to low economic status. Egusi seeds (melon seeds) was a staple ingredient in many West African dishes. Nigerian egusi soup is a soup thickened with ground melon seeds along with green leafy and other vegetables. It is one of the most popular soups prepared by most of the tribes in Nigeria with considerable variation and often eaten with dishes like Pounded Yams and also prepared along with goat, beef, fish, or shellfish.

Nigerians commonly consumed red oil (unrefined form) which is the common palm oil and soya bean oil was consumed by Nigerians on a daily basis. Groundnut oil and butter was consumed weekly by the selected Nigerians.

d) Consumption of Milk and Milk Products

Table XII

Consumption Pattern of Milk and Milk Products

Milk	**Milk products**
Ultra High Temperature (UHT) full cream milk	Yoghurt
Ultra High Temperature (UHT) Semiskimmed milk	Flavoured yoghurt

The dairy products consumption pattern of the selected adults showed that thirty percent of the adult consume Ultra High Temperature (UHT) full cream milk on daily basis whereas yoghurt (40%) and Ultra High Temperature(UHT) semi skimmed milk (26%) were consumed on weekly basis by the selected Nigerians. Flavoured yoghurt was consumed by twenty eight percent of selected Nigerians.

e. Consumption of Fleshy foods

Table XIII

Consumption Patterns of Fleshy Foods

Meat	**Chicken**	**Sea foods**
Lamb knuckle 	Chicken drumsticks 	Fish 
Beef cubes 	Chicken thighs 	Shrimp 

The fleshy foods consumption pattern of the selected adults showed that all the selected Nigerians were non-vegetarians. Nigerians consumed fleshy foods in all their meals which was otherwise considered to be incomplete meal. Beef cubes (52%), chicken thighs (50%) , goat meat leg (46%), and goat meat shoulder (42%) were consumed weekly by the selected adults. Fifty six and forty eight percent of the selected adults consumed shredded beef and minced beef on occasionally basis. Most of the Nigerians did not consume pork varieties. Forty percent of the selected adults consumed egg on daily basis. About forty eight percent of the selected adults consumed fish on daily basis and shrimp on weekly, crabs were consumed occasionally by the selected adult

f. Snacks consumption and non-alcoholic beverages

Table XIV

Consumption Pattern of Snacks and Non-Alcoholic Beverages

Snacks	Non-alcoholic Beverages
Puffs	Carbonated beverages
Biscuits and cookies	Canned juices

The snack consumption pattern of the selected adults showed that forty eight, thirty eight and thirty percent of the adults consumes juices , carbonate beverages and puffs whereas French fries were consumed fortnightly and jams, ice creams, burger and mayonnaise and biscuits were consumed occasionally by the selected adults.

2. **Food consumption pattern of Non Resident Indians(NRIs)**

The food consumption pattern of the selected Non-Resident Indians (NRIs) projected in the table XIII represents the frequency of consumption of different food commodities commonly consumed.

a) Cereal and pulses consumption pattern

Table XV

Consumption Patterns of Cereals and Pulses

Cereal and its products	Pulses
Sona masuri rice 	Toor dhal 
Wheat flour 	Black urad dal 

The cereal consumption pattern of the selected Non Resident Indians (NRIs) showed that they consumed sonamasuri (72%) rice and wheat flour (92%) on a daily basis. Sooji, basmathi rice and noodles were consumed weekly. Instant breakfast mixes was consumed by the selected Non-Resident Indians (NRIs) fortnightly. Refined flour (maida) was taken occasionally.

Toor dhal was taken by most of the selected Non-Resident Indians (NRIs) daily. Black urad dal (68%) was consumed weekly by the selected Non Resident Indians (NRIs). Twenty four percent of the selected adults consumed soya chunks monthly, whereas double beans was consumed fortnightly and almost forty eight percent of the selected adults did not consume pigeon pea in their diet. Non-Resident Indians (NRIs) cooked themselves and they prepared the recipes in Indian style and they consumed.

b) Green leafy vegetables, Roots and tubers and other vegetables

Table XVI

Consumption Pattern of Green Leafy Vegetables, Roots and tubers and other vegetables

Green leafy vegetables	Roots and tubers	Other vegetables
Lettuce 	**Carrot** 	**Cabbage** 
Coriander leaves 	**Beetroot** 	**Egg plant** 

The consumption pattern of the green leafy vegetables , roots and tubers and other vegetables showed that lettuce, coriander leaves and curry leaves were consumed maximum by the selected Non-Resident Indians (NRIs) residing in Nigeria. Bitter leaves and ORA were not consumed by the selected Non-Resident Indians (NRIs). The roots and tubers like irish potato, carrot, beetroot and radish were consumed weekly twice to thrice. Thirty two percent of the selected adults consumed yam fornightly whereas sweet potato was consumed occasionally by the selected Non-Resident Indians (NRIs). The other vegetables like onion and beans were consumed by the selected adults on a daily basis. Maximum of the Non-Resident Indians consumed cabbage and egg plant weekly twice or thrice. Ivy gourd, lady's finger and plantain was consumed by the

selected adults on weekly basis. Yellow pumpkin and spring onions were consumed occasionally by the selected Non- Resident Indians (NRIs) in Nigeria.

c) Fruits, nuts and oils consumption pattern

Table XVII

Consumption Patterns of Fruits, Nuts and Oils

Fruits	Nuts	Oils
Apple 	Tiger nut 	Soyabean oil 
Oranges 	Peanut 	Vegetable oil (refined palm oil) 

The fruit consumption pattern of the selected Non-Resident Indian (NRIs) showed that the apples and orange were consumed more compared to lemon, papaya and grapes which were consumed weekly by the selected Non Resident Indian (NRIs). Twenty percent of the selected Non-Resident Indian (NRIs) consumed dates fortnightly and grapes, pine apple, watermelon, pears and avocado were consumed occasionally by the selected adults of Non-Resident Indian (NRIs). Non-Resident Indian (NRIs) did not consume bread fruit.

Almost 88% of the selected Non-Resident Indian (NRIs) consumed tiger nut on daily basis. Tiger nuts contain vitamins C and B6, as well as iron, magnesium, zinc, potassium, and calcium. it is also found to aid in improving

digestion, heart health, reduce blood sugar levels and boost our immune system and help to fight infections. Peanut, dried dates and almonds were consumed weekly by the selected NRIs. Eighty four percent of the selected Non Resident Indians (NRIs) did not consume melon seeds. Non-Resident Indian (NRIs) used refined palm oil and soyabean oil for cooking.

f) Consumption of Milk and Milk Products

Table XVIII

Consumption Pattern of Milk and Milk Products

Milk	Milk products
Ultra high temperature (UHT) Full cream milk	Yoghurt

Fifty six percent and 40 percent of the selected Non Resident Indians(NRIs) consumed yoghurt and Ultra High Temperature (UHT) - semi skimmed milk on daily basis . Ultra High Temperature (UHT) full cream milk was consumed weekly and skimmed milk was consumed occasionally by the selected Non-Resident Indians (NRIs) in Nigeria. Almost ninety two percent of the selected adults didn't consumed flavoured yoghurt in their diet.

Non-Resident Indians (NRIs) consumed butter weekly. Cheese was consumed occasionally by the selected Non Resident Indians (NRIs).

g) Consumption Pattern of Fleshy Foods

The fleshy foods consumption pattern of the selected Non-Resident Indians (NRIs) showed that 88 percent of the adults consumed chicken, 64 percent of the adults consumed mutton and 44 percent of the Non Resident Indians(NRIs)consumed sea foods like fish on a weekly basis. Forty eight percent of the adults consumed egg on daily basis.

h) Snacks consumption pattern

Almost all the selected Non-Resident Indians (NRIs) consumed biscuits and cookies on a daily basis, whereas papads were consumed weekly. Thirty two percent of the selected Non-Resident Indians (NRIs) consumed carbonate beverages fortnightly. The selected NRIs consumed French fries, bread sandwiches and ice creams occasionally.

D. Dietary Practices

1. **Dietary Practices are the noticeable effort or manner of dietary habits**

The dietary practices like dietary habits, frequency of meals consumption, food allergies, skipping of breakfast, foods consumed during festive seasons and foods consumed for special conditions are discussed below.

Table XIX

Dietary Habits of the Selected Nigerians and Non-Resident Indians (NRIs)

Dietary Habits	Nigerian N = 50	Non resident Indians (NRIs) N = 25
Vegetarian	Nil	2
Non Vegetarian	50	22
Lacto Vegetarian	Nil	1

The above Table IX indicates the dietary patterns of the selected Nigerians and Non-Resident Indians (NRIs). All the fifty selected Nigerians and twenty selected Non-Resident Indians (NRIs) were found to be Non-vegetarians . A minimum of two selected Non-Resident Indians (NRIs) and one Non-Resident Indian.

(NRI) were vegetarian and lacto vegetarian. Nigeria is primarily a non-vegan region, with less than 0.2**%** of its population being vegetarians (Vegafund Org, 2020).

Table XX

Frequency of meal consumption of the Selected Nigerians and Non- resident Indians (NRIs)

Frequency of meal consumption per day	Nigerian N = 50	Non resident Indians (NRIs) N = 25
2 times	19	Nil
3 times	31	25

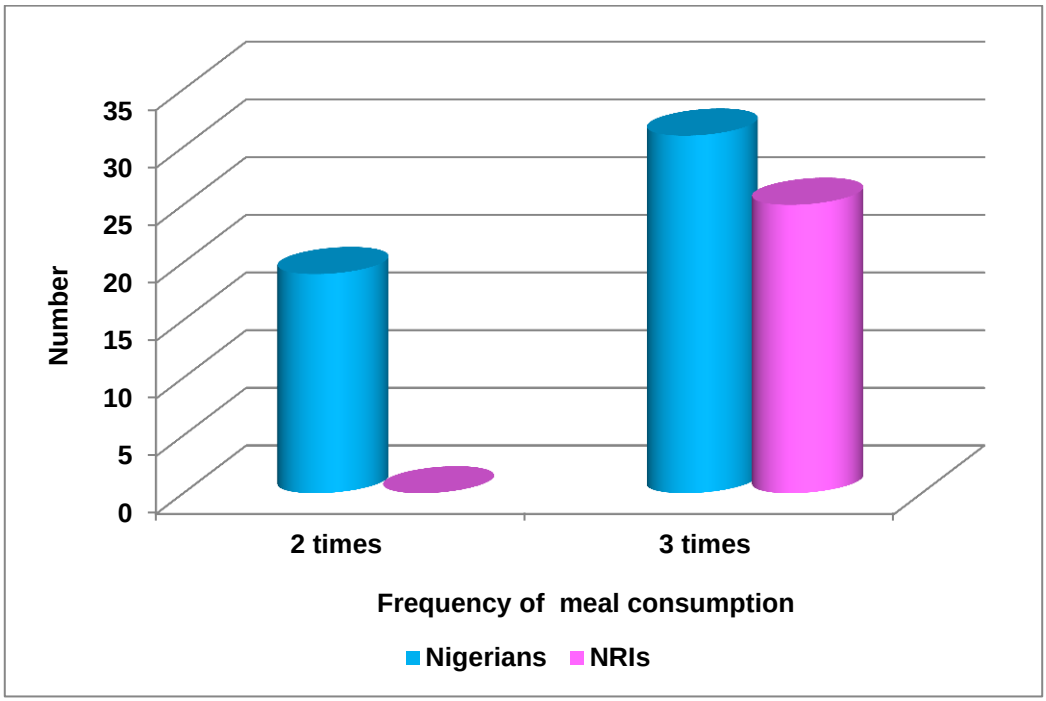


Figure 5: Frequency of Meal Consumption

Meal consumption pattern portrays that thirty one selected Nigerians and twenty five selected Non-Resident Indians (NRIs) followed a normal three meal pattern per day, whereas 19 selected Nigerians consumed two meals per day. Nigerians usually consumes two large meals during the day and, depending on the family, may also consume a light breakfast.

Skipping of Breakfast

Out of fifty selected Nigerians, twenty seven had the habit of skipping breakfast and remaining twenty three Nigerians took breakfast regularly. From the selected 25 Non-Resident Indians(NRIs) , twenty two did not have the habit of skipping breakfast and two Non-Resident Indians (NRIs) skipped breakfast occasionally. The reasons for skipping of breakfast in some families of Nigerians was due to lack of time, religious fasting, and poverty.

Table XXI

Fasting pattern of the Selected Nigerians and Non- Resident Indians (NRIs)

Fasting	Nigerian N = 50	Non- Resident Indians (NRIs) N = 25
Weekly once	9	4
Once in two weeks	3	1
Monthly once	9	3
Festive days	4	0
Occasionally	14	0
Nil	11	17

The above Table XI presents the pattern of fasting among the selected Nigerians and Non-Resident Indians(NRIs) Thirty nine selected Nigerians were found to have the habit of fasting , from that fourteen of the selected adults fast occasionally , whereas among 18 selected Nigerians nine had the habit of fasting weekly once and monthly once. It was found that four of the selected Nigerians fast only during the festive season. Out of 25 Non- Resident Indians (NRIs), 17 of them did not fast. Four Non-Resident Indians (NRIs) had the habit of fasting weekly once whereas three of the adults fast monthly.

Food Allergy

Food allergy was seen in ten numbers of selected Nigerian. The common food that were observed to allergy producing were beans, indomie is nothing but the instant noodles , garri porridge(flour from cassava) , newyam, draw soup (made from okra, ogbono or ewedu leaves (jute)) and titus fish.

Table XXII

Foods Consumed during Festive Seasons by Nigerians

Foods consumed	Festivals
Ponded yam and egusi soup 	Easter, Christmas, New year and new yam festivals
Jollof rice 	Easter, Christmas and Newyear
Veggies rice, turkey stew and fruits	Easter
  	

Nigerians mostly celebrate the festivals like Easter, NewYear, Christmas, Eid Al Fitr and New yam festival. The New Yam Festival popularly known as “Orureshi, Iwa ji, Iri ji, Ike ji, or Otute (depending on dialect) is an annual cultural festival usually held at the end of the rainy season in early August to October every year. Twenty number of the selected adults had yam and native soup in the new yam festival which was the traditional dish and “the sarara” (a white-coloured soup made with chunks of grounded egusi seeds and assorted meat). The foods they consume during Christmas were jollof rice, rice with stew , stew mainly of beef , chicken and mutton Jollof rice is a staple dish made with long-grain rice, tomatoes, onions, spices, vegetables and meat in a single pot. Seven of the selected Nigerians had rice with stew as their dish and number of five adults had jollof rice as their Christmas dish. Fried rice is a rice dish that’s made with meats, mixed veggies (carrots, peas, sweet corn, green beans) and spices which was taken as a special dish by five number of selected adults of Nigerian. The special dish of nigerian during easter festival were Rice and stew, Pounded yam and soup, Fried chicken rice, meat , jollof rice , Fried beef rice , Fruits , veggies rice and turkey stewing .fried chicken rice of six number of adults taken as their special dish during festival of Easter.

The foods taken during New year festival were coconut rice, eugusi soup and pounded yam, meat with rice, beef steak. Most number of the selected adults had jollof rice and rice with stew as their special dish of the festive days.

Table XXIII

Foods Consumed for Special Conditions by the Selected Nigerians

Foods	Diseases condition
Garri porridge 	Fever , cold , cough and diarrhoea

Pap 	Fever, cold, cough, and darrhoea
Egg sauce 	cough

Garri porridge

Table XXIII depicts the special foods consumed during common illness. To manage cold symptoms the selected Nigerians took lemon tea, lemon ginger tea , goat meat soup, vegetables , pap, garri and chicken soup. Pap is made from fermented corn which was taken by two of the selected Nigerians. The foods that were taken during cough were ginger, honey, white yam with egg sauce Semovita is nothing but semolina which was taken during the condition of Diarrhoea.

E. Lifestyle Pattern of Nigerians and Non-Resident Indians (NRIs)

The lifestyle practices like smoking habit, type and frequency of consumption of alcoholic beverages and physical activity pattern of the selected Nigerians and Non- Resident Indians **(**NRIs) are discussed under the following tables.

Table XXIV

Smoking habits of the Selected Nigerians and Non-Resident Indians (NRIs)

Number of cigarettes	Nigerian N = 50	Non Resident Indians (NRIs) N = 25
Less than 10	5	2
More than 5	NIL	1
Less than 5	NIL	4
Nil	45	16

From the above Table XXV, it was good to note that the maximum number of the selected Nigerian adults (45) and Non Resident Indians **(**NRIs) (16) didn't have the habit of smoking . Among the total number minimum of five selected Nigerians and two selected Non Resident Indians (NRIs) were smoking less than 10 cigarettes per day. Four selected NRIs smoked less than 5 cigarettes and only one Non Resident Indian(NRI) had the habit of smoking more than 5 cigarettes per day. The study done by Adeloye et al 2019 is par with the present study shows that among total participants of 54,755, the prevalence of current smokers was 10.4% and 17.7 percent are ever smokers.

Table XXV

Alcohol Consumption

Type of alcohol	Nigerians N= 50	Non-Resident Indians (NRIs)
Beer	918	7
Wine	17	5
Spirits	6	9
Nil	9	4

Beer was the prime alcoholic beverage consumed by the most of the selected Nigerians, whereas Non-Resident Indians(NRIs) consumed spirits more. Next to beer and spirits wine was taken by Nigerians and Non-Resident Indians. Most of the Nigerians had the habit of consuming alcohol on a daily basis, where as Non- Resident Indians (NRIs) consumed weekly.

Table XXVI

Physical activity of the Nigerians

Average physical activity / day	Nigerian N = 50
Push ups	4
2 - 5 km walking	17
Home gym 45 mts	3
Household work	1
Jogging	6
Nil	19

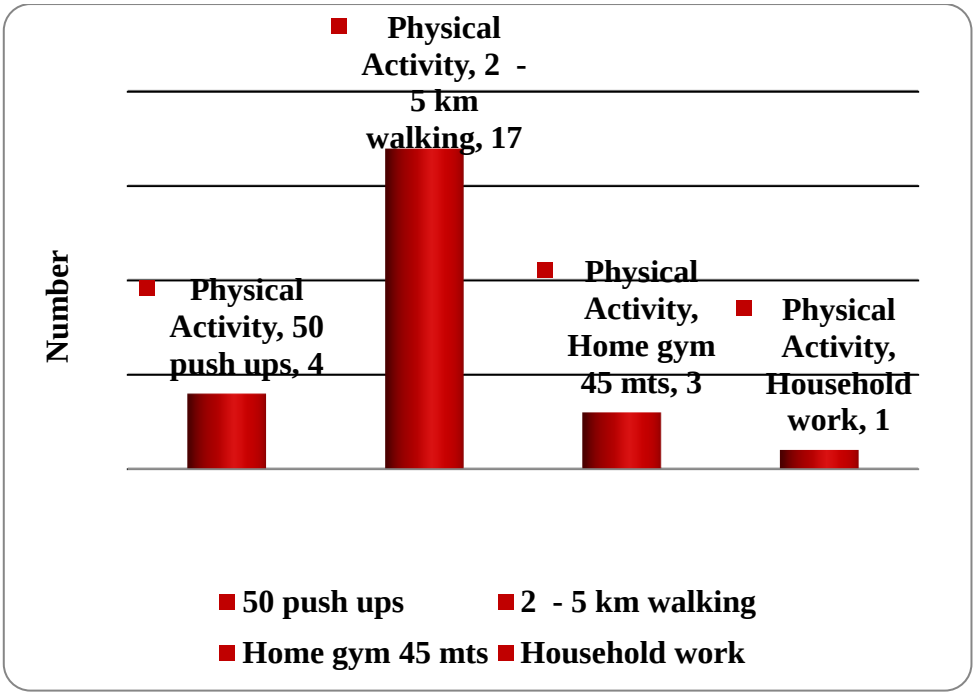


Figure 6: Physical activity of the Nigerians

A total of thirty one selected Nigerians actively engaged themselves in different physical activity like jogging, walking, pushups, workout in gym and at home . Brisk walking was done by 17 selected Nigerians followed by jogging (6) , performing pushups(4) and only one involved in household work. Rest of the 19 adults did not perform any kind of physical activity. Out o 12 selected female Nigerians six of them performed walking.

Table XXVII

Physical Activity pattern of the Non-Resident Indians (NRIs)

Frequency of walking	Non Resident Indians (NRIs) N = 25
30 minutes	7
40 minutes	4
1 hour	2
Nil	12

The main form of physical activity which was done by Non Resident Indians (NRIs)was walking. Most of them went for walking for 30 mts; two selected Non Resident Indians (NRIs) went for walking for 1 hour. Remaining 12 selected Non Resident Indians (NRIs) were not involved in doing any kind of physical activity.

V SUMMARY AND CONCLUSION

The study was carried out to with the main objective to assess the food consumption pattern and dietary practices of the Nigerians and NRIs who were residing in Nigeria. There is a vast difference in the culture, life style and food habits of Nigerians and Non-Resident Indians (NRIs). The literacy rate in Nigeria is also lower compared to India and other countries. Nigerians earn very less wages for their work. The NRIs who were residing in Nigeria were devoid of Indian traditional foods and their consumption pattern was according to the availability food commodities in Nigeria. They cook by themselves according to the availability of our foods. Most of food commodities were imported from other countries in Nigeria so; the cost of the commodities was found to high.

The study titled **"Food Consumption and Dietary Practices of Nigerian and NRIs – A Virtual Study"** was carried out with the objectives to study the background details, nutritional status by assessing the body mass index, food consumption pattern of Nigerians and Non-Resident Indians (NRIs), dietary practices and lifestyle pattern of both the Nigerians and Non-Resident Indians (NRIs) residing in Nigeria.

The methodology for the present study encompassed a total of 75 adults including 50 Nigerians and 25 NRIs in the age range of 21 – 50yrs. They were administered with a well structured Google form to elicit the details on the background information, anthropometric indices, food consumption pattern, dietary practices and lifestyle habits. Personal details consisting of name, age, monthly income, Email id, and number of members in the family were assessed which provided the outline picture on their background information of the both Nigerians and NRIs. Anthropometric indices mainly height and weight of the selected participants were taken from the filled in Google forms and the Body Mass Index was computed to elicit their nutritional status. Dietary pattern of selected Nigerians and NRIs were analysed by finding out their of food consumption pattern and dietary practices like meal consumption, skipping of breakfast, fasting pattern and food allergies. Foods consumed for festive seasons and diets for special conditions were elicited for the selected Nigerians. Life style habits provided the information on the physical activity,

smoking, beverages and alcoholic consumption were elicited. The data collected were analysed and the results were interpreted.

The salient findings of the study are summarized below:

- Age and gender distribution of the selected Nigerians and Non-Resident Indians (NRIs) showed that there were no female Non-Resident Indians (NRIs). Maximum number of selected Nigerians including male and female were in the age range of 26-35 years. It was observed that the total number female Nigerians were less compared to males due to low employability compared to males. Number of NRIs were more in the age group of 46-50 years.
- The marital status depicted among the 50 selected Nigerians 30 were unmarried as they wanted to fulfil their dreams like house, car and then after that they wanted to settle in life. Female Nigerians also wanted to marry a well settled man. All most all the NRIs were married.
- Educational qualification of the selected Nigerians and Non-Resident Indians (NRIs) projected that 20 Nigerian adults had done their diplomas and 19 had completed their under graduation and four had done their master graduation and 7 had done senior secondary education. Among selected Non-Resident Indians (NRIs) 16 and eight of them had completed their under graduation and post graduation. The overall literacy rate for of the selected Nigerians was lower than selected NRIs.
- The monthly income of the Nigerian adults reveals that the maximum number of the selected Nigerians up to 40000 to 60000 naira which was 7,200 – 10,800 in Indian rupees. The selected Non-Resident Indians (NRIs) earned more compared to selected Nigerians as they were in high positions.
- It was found that a maximum of 2- 4 members were in the Nigerian family. The reasons for the more number of persons in the family were due to lack of knowledge of family planning , poverty, lack of education and the head of the family wanted their offspring to be involved in farming.

- The amount of income spent for food by Nigerians was 1867 – 5602 in Indian rupees. Nigerians spend 50 percent of their earnings mostly for food items.
- Body mass index revealed that overweight and obesity was more prevalent among Nigerians, than NRIs. This was due to high intake of more processed food or ready to eat foods , fleshy foods alcoholism, skipping meals.
- All the selected Nigerians were non-vegetarian and minimum of two and one Non-resident Indians (NRIs) were vegetarian and one lacto vegetarian.
- Maximum of the selected Nigerian and NRIs were following three meal pattern. The fasting was seen commonly in Nigerians .Fourteen of them fast occasionally and nine of them fast during festive seasons like Easter and Ramzan.
- Minimum of 10 selected Nigerians complained of food allergies which was mainly due beans, indomie (instant noodles) , garri porridge prepared from cassava flour , new yam, draw soup that is made from okra, ogbono or ewedu leaves (jute)) and titus fish.
- Frequency of food consumption pattern revealed that most of them consumed parboiled rice in the lunch as jollof rice or fried rice and bread in the form of sandwich during breakfast on a daily basis and Noodles and Garri flour porridge was consumed on a weekly basis. The pulses consumed by them were double beans which was added to make" ewa riro "(stewed beans) or Nigerian bean porridge and fio – fio was consumed in the form of porridge or it was combined with yam, meat or fish to make a sauce as we stir fry the vegetables.
- The bitter leaves and ORA / OHA (Rosewood plant) leaf were consumed on weekly basis with the percentage of 34 and 26. These green leafy vegetables were made as soup and stews along with other vegetables or meats. The other green leafy vegetables which are grown abundantly in that region are Chaya leaves, Ofe ugbogoro , Yakwa , uziza but it was observed that these green leafy vegetables were not consumed by the

selected Nigerians because of their lesser availability in the market. Other vegetables like cabbage , bell pepper , beans , cucumber , plantain , Okra , capsicum were consumed in the form of stews or soups and stir fry .

- Nigerians consumed roots and tubers like yam, cassava , potato and carrot on weekly basis .They also consume recipes made from cassava flour like “garri”, “fufu” and “abacha” for their breaksfast as porridge, rice cake, stir fry and salad.
- Apples, oranges and green banana were consumed regularly and other fruits like watermelon, grapes, papaya and pineapple were consumed weekly by the selected Nigerian because of its easy availability in these places. Thirty four percent of Nigerians consumed bread fruit occasionally because of lesser availability and it was grown mostly in forest areas
- Egusi seeds (melon seeds) was consumed mostly by the selected Nigerian as it was a staple ingredient in many West African dishes. Nigerian egusi soup is a soup thickened with ground melon seeds along with green leafy and other vegetables and often eaten with dishes like pounded yams and also prepared along with goat, beef, fish, or shellfish. Nigerians mostly consumed red oil and soyabean oil in their diet. The red oil is the unrefined form of palm oil. The other fats like butter and groundnut was taken either weekly or occasionally
- Thirty and 40 percent of the Nigerians consumed Ultra High Temperature full cream milk and yoghurt either daily or weekly. Only 20 percent of the selected adult consumed white sugar on daily basis because they drink only packed fruit juices and hot beverages occasionally. Packed fruit Juices, carbonated beverages , french fries and puffs consumed weekly by the Nigerians because they are not affordable to buy in regular basis
- All the selected Nigerians were non-vegetarians. Mutton and beef was consumed alternately in the form of cubes or shredded or any specific parts of the meat regularly. They consumed sea foods on regular basis as they were residing near the coastal areas. Most of them did not consume pork varieties following religious belief. Forty percent Nigerian adults

consume egg on daily basis in the form of sauces. Egg sauces is nothing but the stir fry which was served along with breakfast

- The cereals consumed by the selected NRIs residing in Nigeria were sonamasuri rice and wheat because both were staple food of NRIs. Instant breakfast mixes and noodles were consumed during busy work schedules by NRIs because it is a ready to cook food and it takes less preparing time. Pulses like urad dal and toor dal was taken regularly as it is used in making Indian recipes like dosa and sambar and also chapathi with dal.
- Mostly NRIs consumed green leafy vegetables like lettuce, curry leaves, corriander weekly according to the availability in that particular place. The roots and tubers consumed by NRIs adult were carrot radish, potato either weekly or fortnightly in their preparations. Other vegetables like onions, beans and tomatoes were consumed regularly by the selected NRIs. Mostly they consumed fruits like apple, oranges, papaya and grapes because of their availability.
- The nut which was consumed mostly by the selected NRIs was tiger nut which was grown abundantly in Nigeria and it had more health benefits like boosting the immune system and helping to fight against infections. The cooking oil which was consumed regularly by NRIs were soyabean oil and vegetable oil (refined palm oil).
- About 48% of the selected NRIs consumed egg regularly. The fleshy foods like chicken and meat was consumed weekly by the selected NRIs. The selected NRIs consumed more of biscuits and cookies regularly along with tea or coffee. Papads and canned fruit juices were consumed weekly by the selected NRIs.
- Nigerians mostly celebrates the festivals like New year, Easter, Ramzan and New yam festival. Twenty of the selected Nigerians had pounded yam and native soup in the new yam festival which was a traditional dish and native soup is made with grounded egusi seeds and assorted meat. The special dishes during festive seasons were jollof rice, made with rice, spices , vegetables and meat , rice and stew either vegetable stew or meat stew, fried chicken or beef rice and stir fry beef or mutton.

- The special foods were consumed by the selected Nigerians during common illness like cold, cough and diarrhoea. The foods that were consumed during cold was tea made out of ginger or lemon, goat meat or chicken or any vegetables soup , pap is a prepared from fermented corn which was taken as breakfast by Nigerians and garri is the flour made from cassava which is made into porridge. The foods that were consumed during cough by the selected Nigerians were ginger, honey, white yam with egg sauce. Bread, rice porridge, semovita, ORT, swallows and soups, fruits were consumed during the illness of diarrhoea by selected Nigerians.
- The study revealed that maximum number of the selected forty five Nigerians and sixteen NRIs didn't have the habit of smoking. The minimum number of five selected Nigerian and two selected NRI were smoking less than 10 cigarattes per day.
- Beer was the prime alcoholic beverages consumed by most of the selected Nigerians.
- It is good to notice that total of thirty one selected Nigerians actively involved in different physical activities like jogging, walking, workout in home gyms for 45mts and push ups. Out of twelve female adult of selected Nigerian seven were involved in physical activities like walking , push ups and household work
- Walking was the main physical activity involved by most of the selected NRIs. Most of them went for a walk of about 30mts per day by selected NRIs. Four and two of the selected Nigerian went for walking about 40 mts and 1 hr.

Conclusion

The food consumption pattern and dietary practices vary from region to region and there is vast difference between cultural and religious practices followed especially with regard to food consumption. The socio-economic status of the Nigerians was lower than Non-Resident Indians (NRIs) the predisposing factors for this was low educational qualification, more of family members and

poor economy. Most of the Nigerians were overweight and obese due to high carbohydrate intake, usage of red oil, fleshy foods and alcohol consumption. Dietary pattern showed that all the selected Nigerians were non-vegetarians and consumed different varieties of foods according to their culture and religious practices, whereas NRIs were consuming the foods which ever was available. Lifestyle pattern showed that most of the selected Nigerians consumed had the habit of smoking and consuming alcoholic beverages in comparison to NRIs. There was vast difference observed between the Nigerians and NRIs with respect to food consumption pattern and other contributing factors which was found to be confronting with the their consumption pattern.

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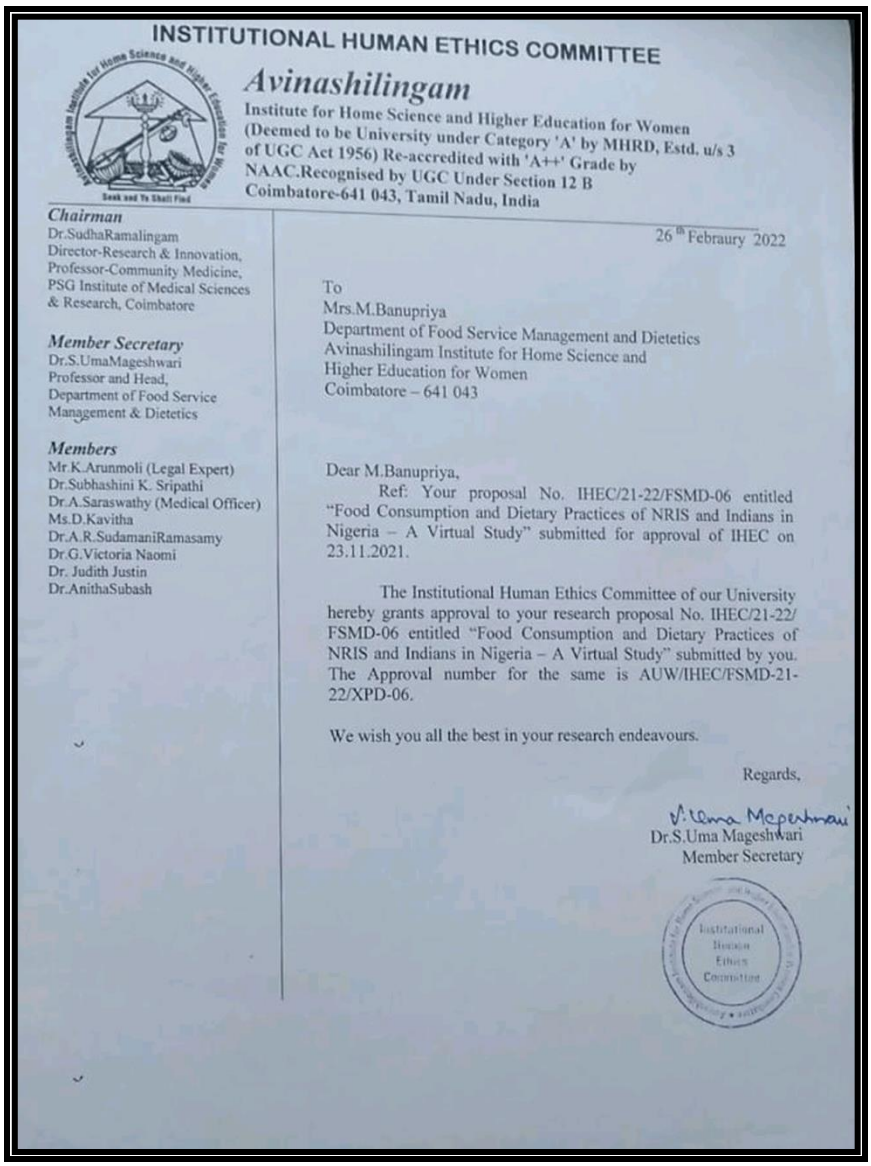
ANNEXURE I

Institutional Human Ethics Committee Certificate



INSTITUTIONAL HUMAN ETHICS COMMITTEE

Avinashilingam

Institute for Home Science and Higher Education for Women
(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956) Re-accredited with 'A++' Grade by NAAC.Recognised by UGC Under Section 12 B
Coimbatore-641 043, Tamil Nadu, India

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Professor-Community Medicine,
PSG Institute of Medical Sciences & Research, Coimbatore

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Professor and Head,
Department of Food Service Management & Dietetics

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Dr.Subhashini K. Sripathi
Dr.A.Saraswathy (Medical Officer)
Ms.D.Kavitha
Dr.A.R.SudamaniRamasamy
Dr.G.Victoria Naomi
Dr. Judith Justin
Dr.AnithaSubash

26th Febraury 2022

To
Mrs.M.Banupriya
Department of Food Service Management and Dietetics
Avinashilingam Institute for Home Science and
Higher Education for Women
Coimbatore – 641 043

Dear M.Banupriya,

Ref: Your proposal No. IHEC/21-22/FSMD-06 entitled "Food Consumption and Dietary Practices of NRIS and Indians in Nigeria – A Virtual Study" submitted for approval of IHEC on 23.11.2021.

The Institutional Human Ethics Committee of our University hereby grants approval to your research proposal No. IHEC/21-22/FSMD-06 entitled "Food Consumption and Dietary Practices of NRIS and Indians in Nigeria – A Virtual Study" submitted by you. The Approval number for the same is AUW/IHEC/FSMD-21-22/XPD-06.

We wish you all the best in your research endeavours.

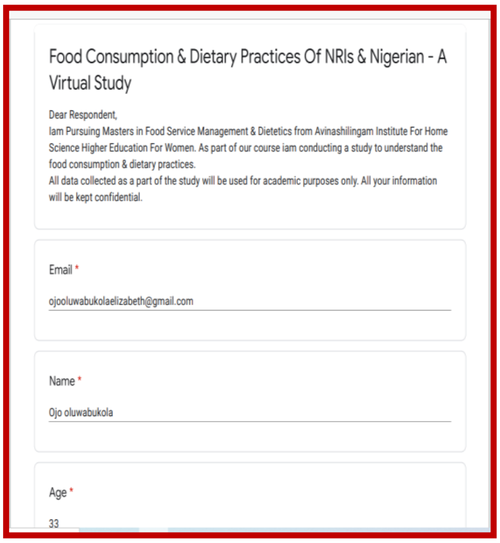
Regards,

Dr.S.Uma Mageshwari
Member Secretary

Institutional Human Ethics Committee

ANNEXURE II

Google Forms



Food Consumption & Dietary Practices Of NRIs & Nigerian - A Virtual Study

Dear Respondent,
Iam Pursuing Masters in Food Service Management & Dietetics from Avinashilingam Institute For Home Science Higher Education For Women. As part of our course iam conducting a study to understand the food consumption & dietary practices.
All data collected as a part of the study will be used for academic purposes only. All your information will be kept confidential.

Email *

ojooluwabukolaelizabeth@gmail.com

Name *

Ojo oluwabukola

Age *

33

Food Consumption & Dietary Practices Of NRIs & Nigerian - A Virtual Study

Monthly Income (N = NAIRA) *

- N 20000 - 40000
- N 40000 - 60000
- N 60000 - 80000
- N 80000 - 100000
- Other:

Total number of persons in your family *

7

How much amount you spent on food (per monthly) *

25000

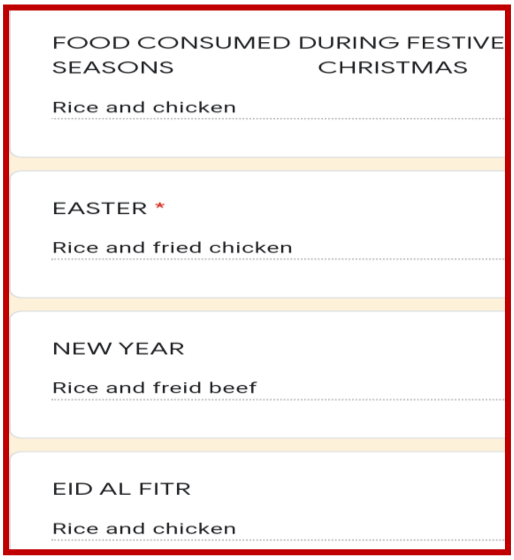
ANTHROPOMETRIC MEASUREMENTS

Height (cm) *

5.7

Weight (kg) *

69



FOOD CONSUMED DURING FESTIVE SEASONS CHRISTMAS

Rice and chicken

EASTER *

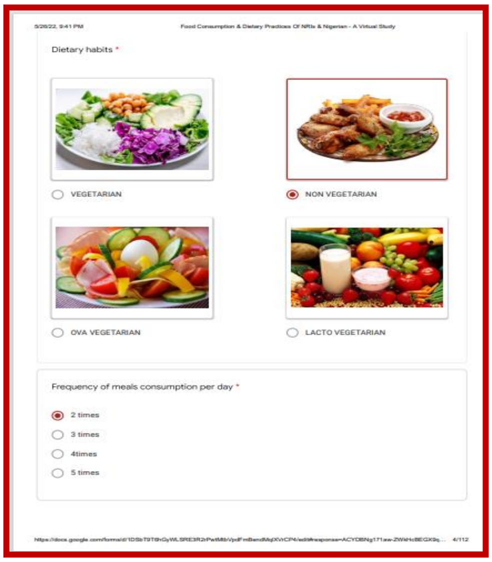
Rice and fried chicken

NEW YEAR

Rice and freid beef

EID AL FITR

Rice and chicken



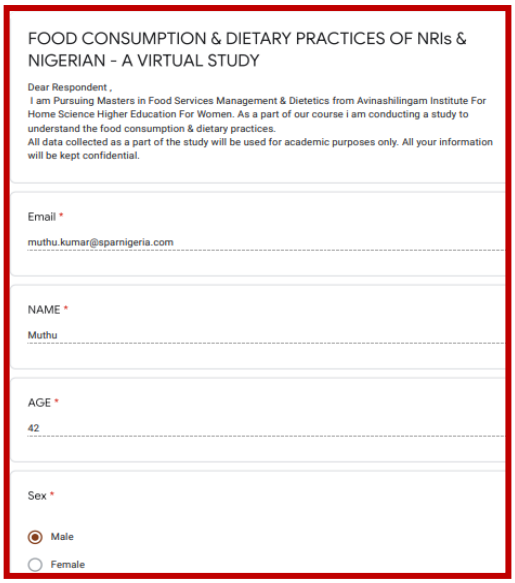
Food Consumption & Dietary Practices Of NRIs & Nigerian - A Virtual Study

Dietary habits *

- VEGETARIAN
- NON VEGETARIAN
- OVA VEGETARIAN
- LACTO VEGETARIAN

Frequency of meals consumption per day *

- 2 times
- 3 times
- 4times
- 5 times



FOOD CONSUMPTION & DIETARY PRACTICES OF NRIs & NIGERIAN - A VIRTUAL STUDY

Dear Respondent ,
I am Pursuing Masters in Food Services Management & Dietetics from Avinashilingam Institute For Home Science Higher Education For Women. As a part of our course i am conducting a study to understand the food consumption & dietary practices.
All data collected as a part of the study will be used for academic purposes only. All your information will be kept confidential.

Email *

muthu.kumar@sparnigeria.com

NAME *

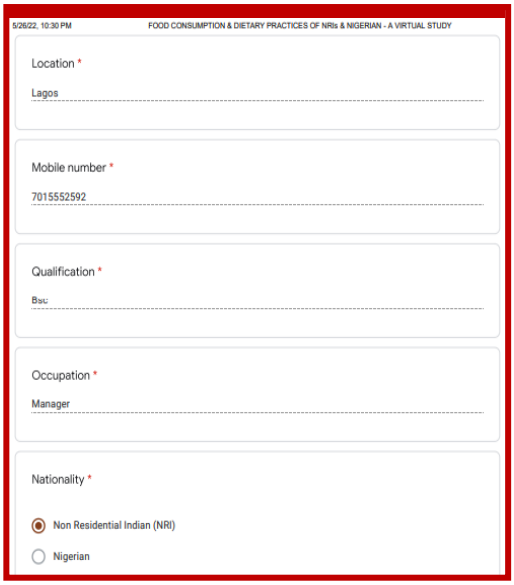
Muthu

AGE *

42

Sex *

- (●) Male
- ( ) Female



5/26/22, 10:30 PM FOOD CONSUMPTION & DIETARY PRACTICES OF NRIs & NIGERIAN - A VIRTUAL STUDY

Location *

Lagos

Mobile number *

7015552592

Qualification *

Bsc

Occupation *

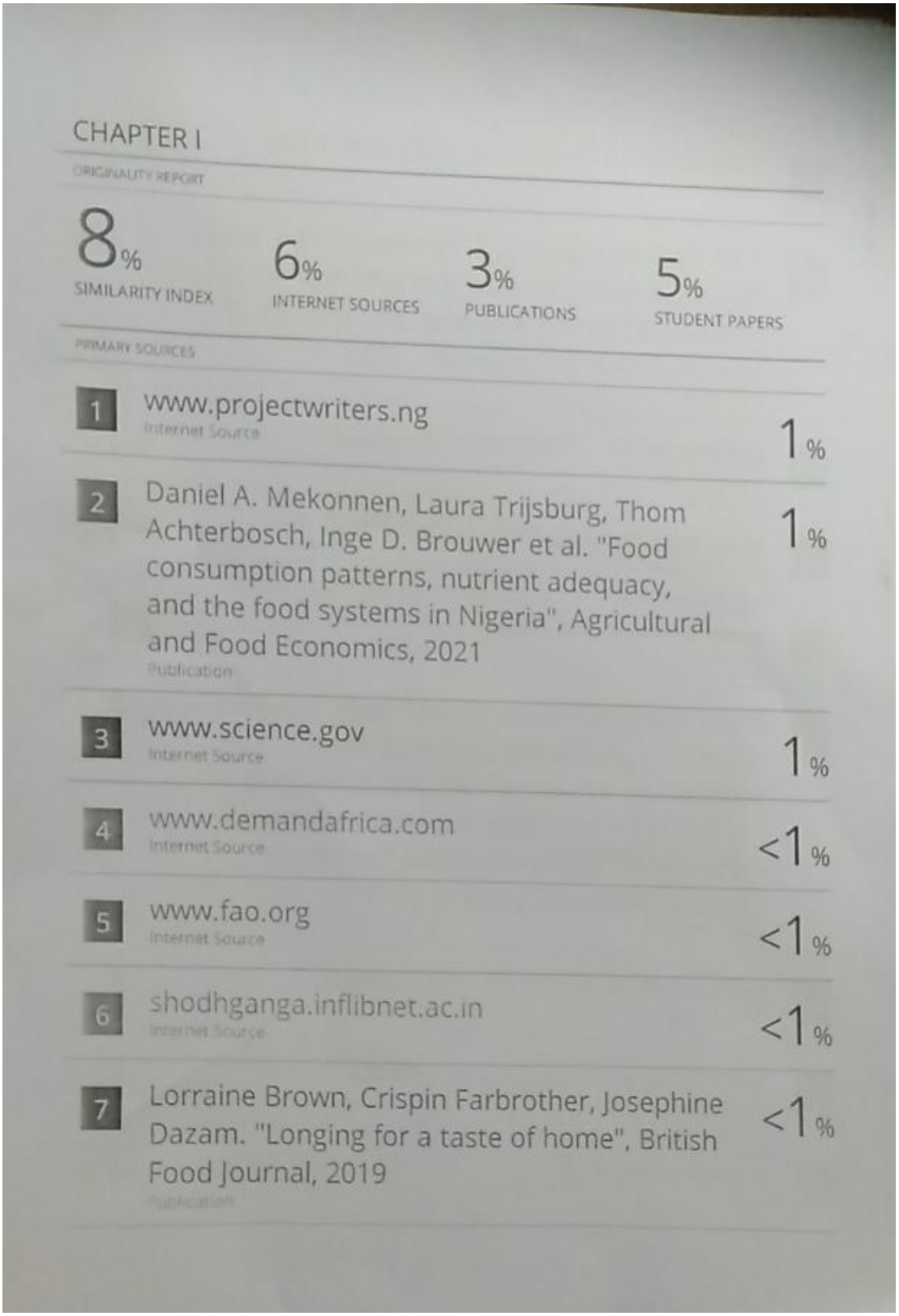
Manager

Nationality *

- (●) Non Residential Indian (NRI)
- ( ) Nigerian

ANNEXURE III

Plagiarism Report



CHAPTER I

ORIGINALITY REPORT

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PRIMARY SOURCES

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4	www.demandafrica.com Internet Source	<1%
5	www.fao.org Internet Source	<1%
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7	Lorraine Brown, Crispin Farbrother, Josephine Dazam. "Longing for a taste of home", British Food Journal, 2019 Publication	<1%